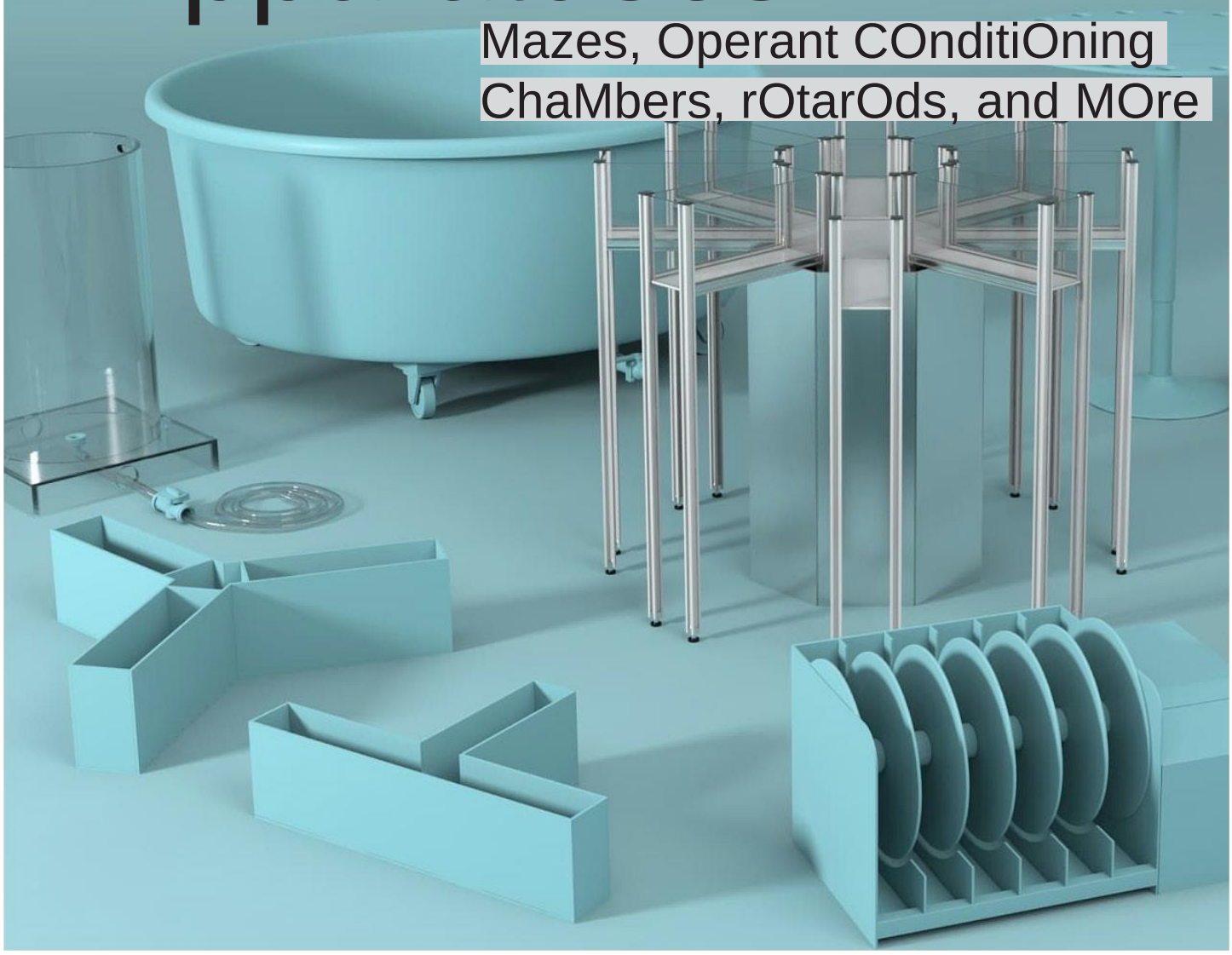
PRODUCT CATALOGUE 2019/2020

Behavioral Research Apparatuses

Mazes, Operant COnditiOning ChaMbers, rOtarOds, and MOre



www.mazeengineers.com

MAZE ENGINEERS

> My experience with MazeEngineers has surpassed all expectations. They have proved to be highly accessible, providing me with regular updates on project development, and have been highly responsive to all my concerns. They have substantial expertise in animal behavior and maze automation that has made the design of a completely new and customized maze a truly collaborative and efficient process.

Rebekah Mannix,
MD Boston Children's Hospital

MAZE
ENGINEERS

PRODUCT CATALOGUE 2018

Maze Eng Inc, S Corporation

DUNS: 079187988
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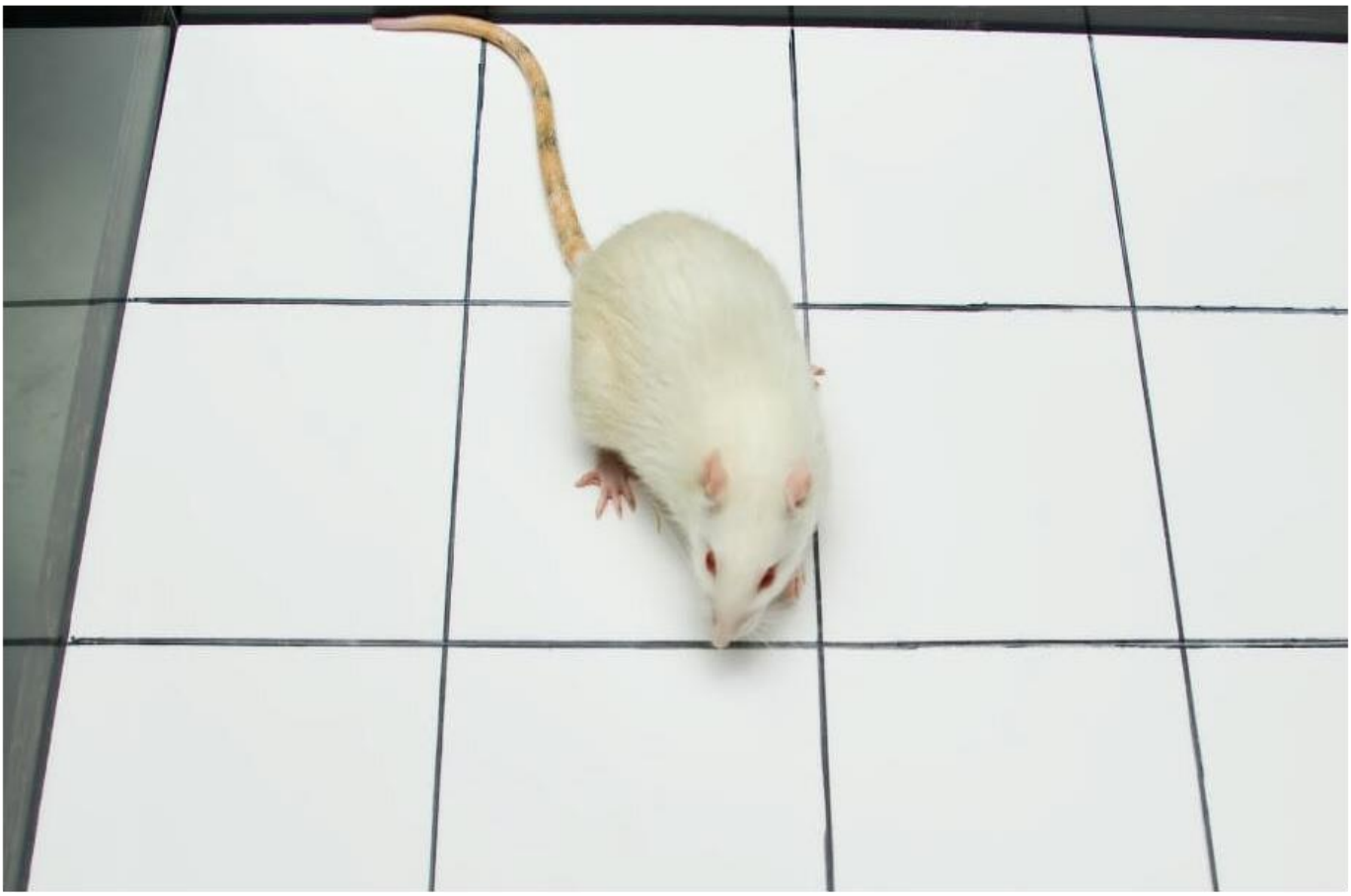
About us

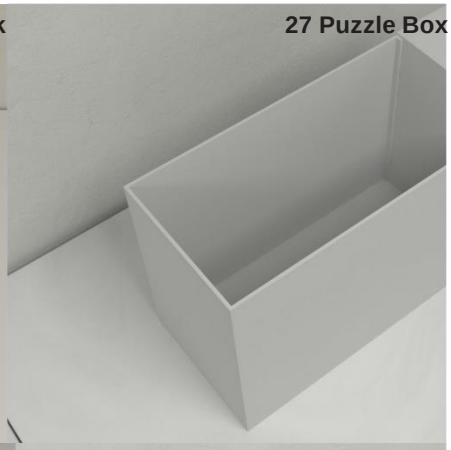


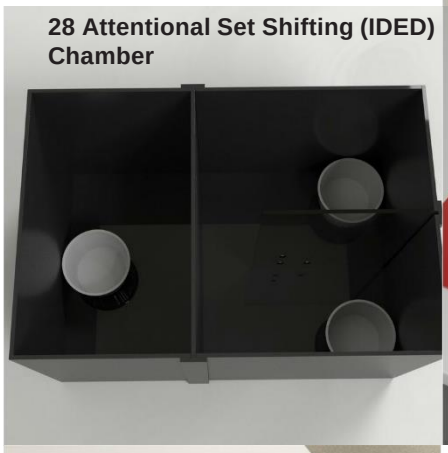
Whether you need a simple acrylic structure for novel exploration or sophistica-ted materials design-computer interaction, MazeEngineers is the ideal partner for your neuroscientifi c needs. We work with clients big and small across a range of academic and pharmaceutical enterprises to ensure proper scientifi c validity in behavioral protocols. We specialize in murine and rodent behavioral interactions with environments and data collections methodologies that adhere to the principles of simplicity, precision, and validity.

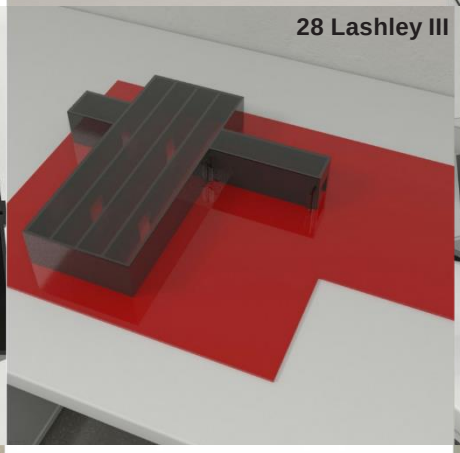
Table of contents

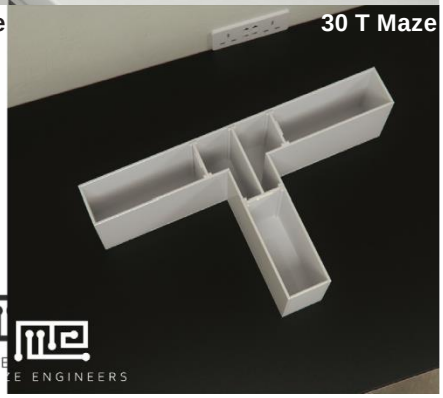
Rodents

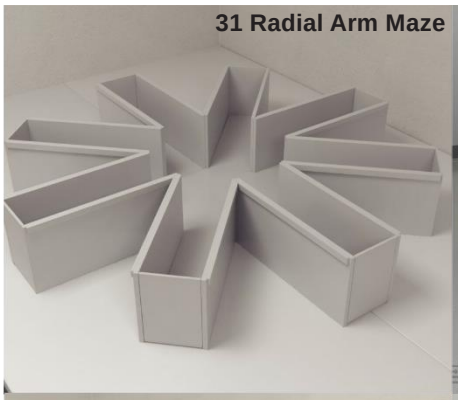
Classic: learning










31 Radial Arm Maze


31 Morris Water Maze

Classic: anxiety & depression


32 Successive Alleys


32 Tail Suspension


33 Elevated Plus Maze

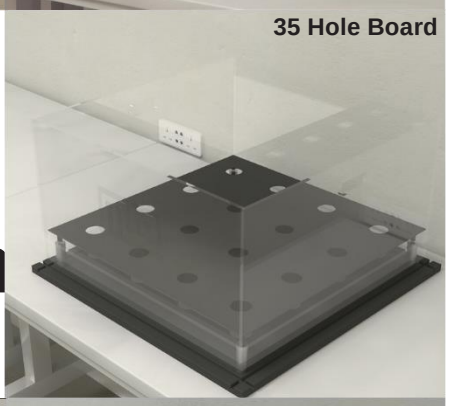

33 Barnes Maze

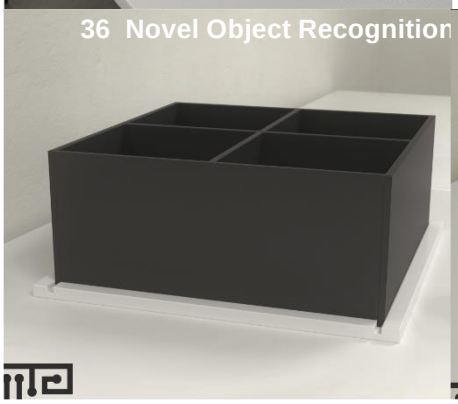

34 Zero Maze

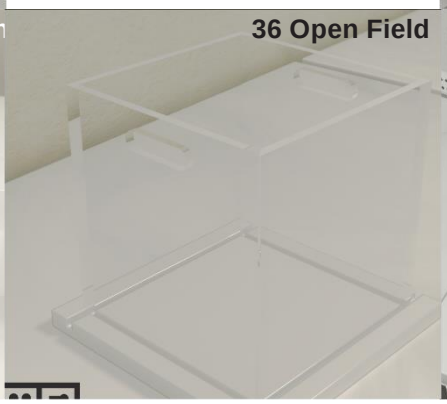

34 Forced Swim Test

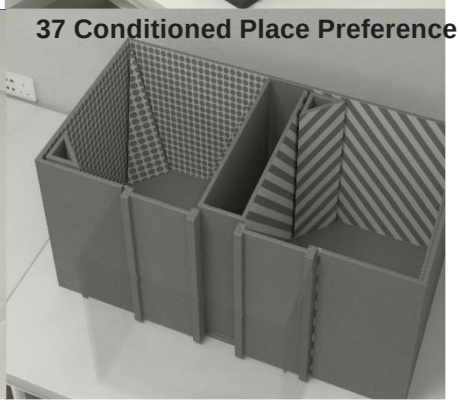

35 Light Dark Box

Classic: exploration

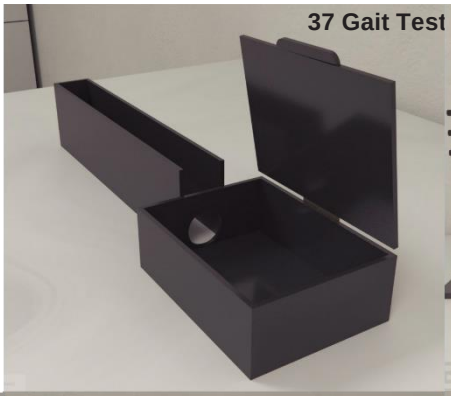

35 Hole Board


36 Novel Object Recognition


36 Open Field


37 Conditioned Place Preference

Classic: motor


37 Gait Test

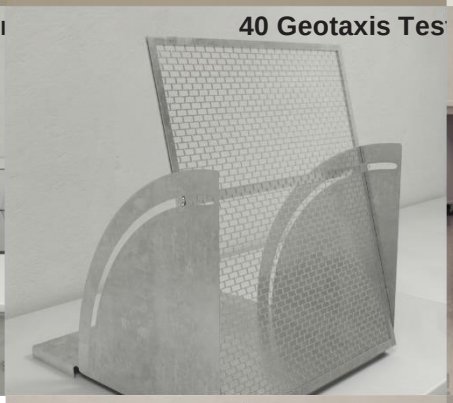

38 Triple Horizontal Bars


38 Static Rods


39 Parallel Bars


39 Skilled Forelimb Test


40 Horizontal Ladder


40 Geotaxis Test

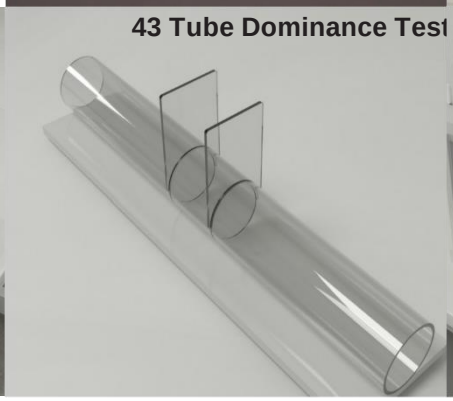

41 Balance Beam

Classic: social


41 Empathy Assay

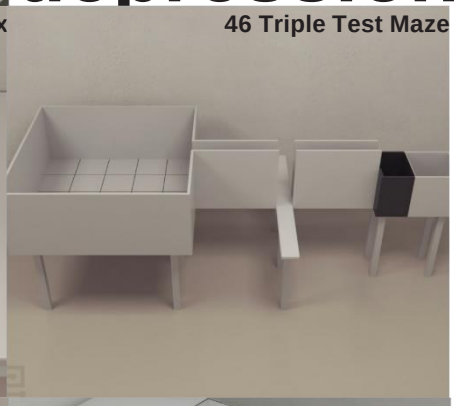

42 Visual Burrow System

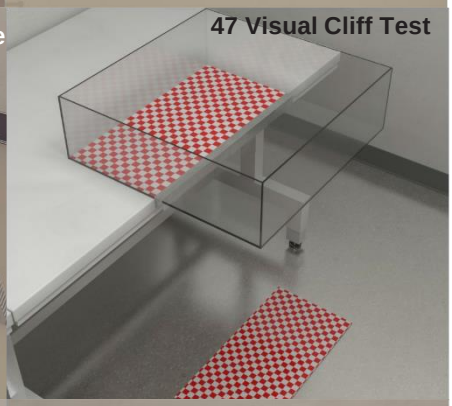

42 Social Reward Chamber


43 Tube Dominance Test

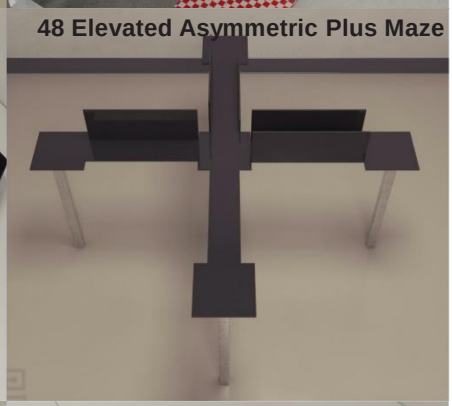

43 Resident Intruder

Discover: discover anxiety & depression

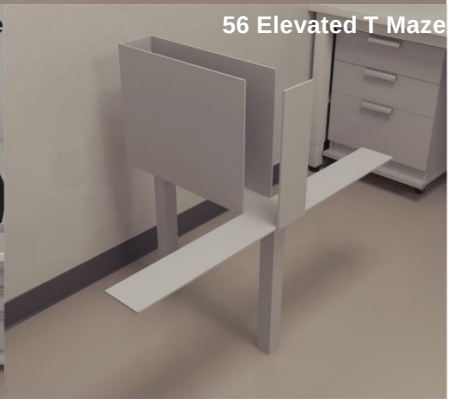


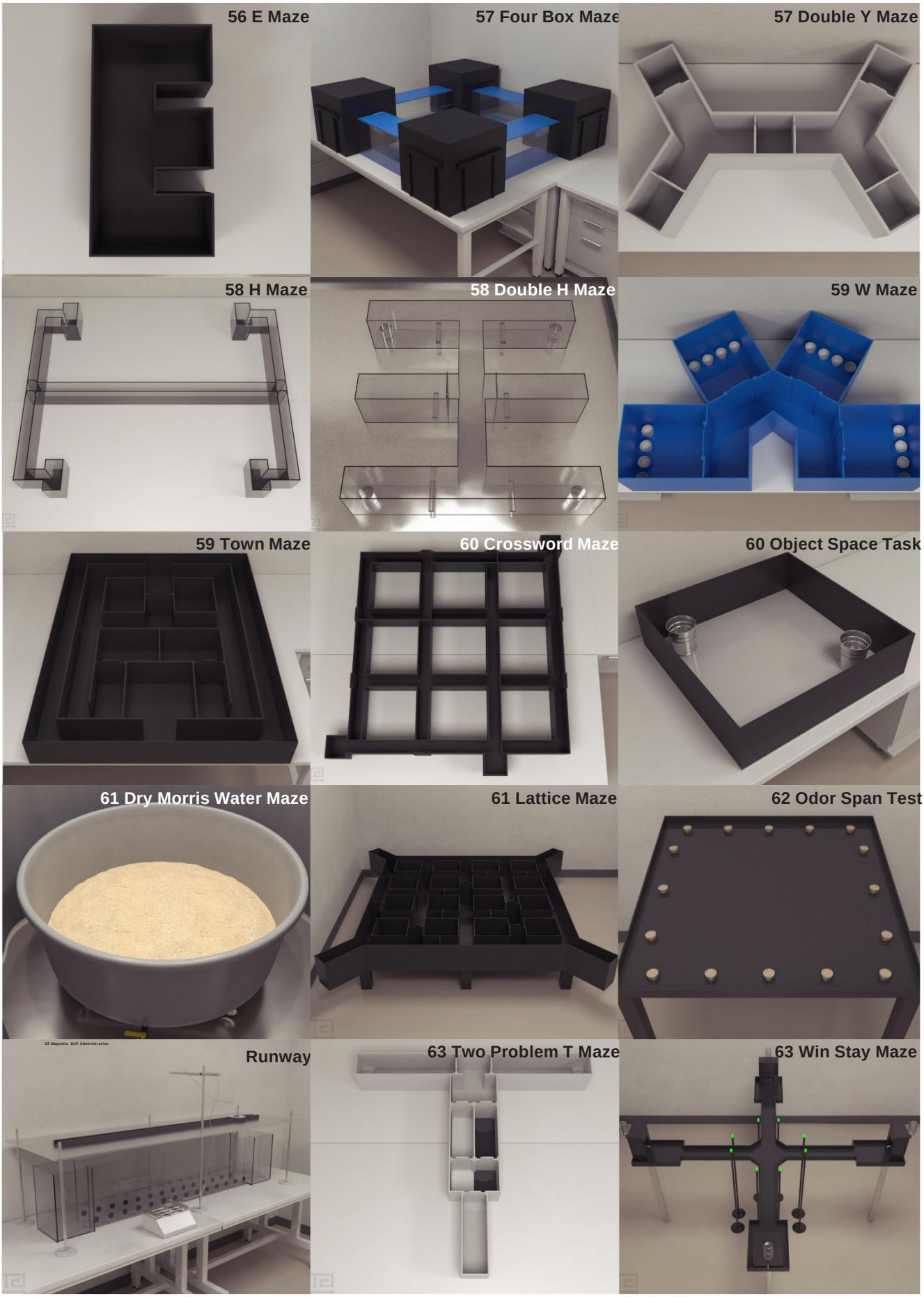


Discover: discover exploration



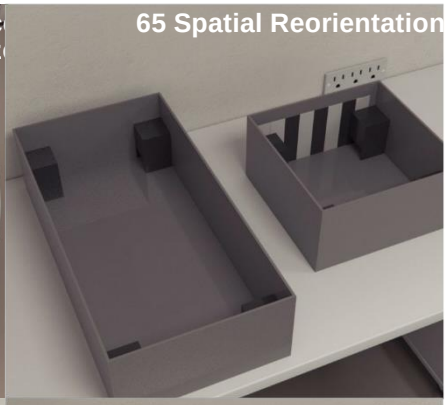
Discover: discover learning




56 E Maze
57 Four Box Maze
57 Double Y Maze
58 H Maze
58 Double H Maze
59 W Maze
59 Town Maze
60 Crossword Maze
60 Object Space Task
61 Dry Morris Water Maze
61 Lattice Maze
62 Odor Span Test
Runway
63 Two Problem T Maze
63 Win Stay Maze


64 Mirror Chamber Version 2


64 Delayed Matching To Plac
(DMP) Barnes Maz


65 Spatial Reorientation

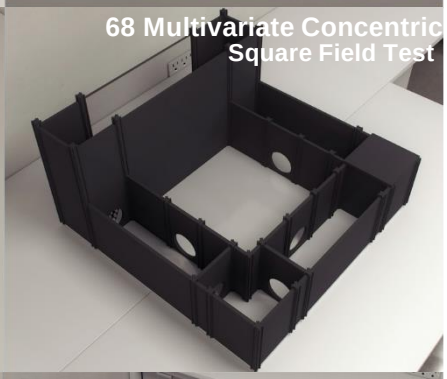

65 Escape Hole Radial Arm Maze


66 Controlled Y Maze


66 Ziggurat Task


67 Randomized Barnes


67 Mirror Chamber


68 Multivariate Concentric
Square Field Test


68 Continuous Angled T Maze


69 Self Administration Runway


69 Morris Water Straight Swim
Channel


70 Morris Water Snowcone


70 Hairpin Maze

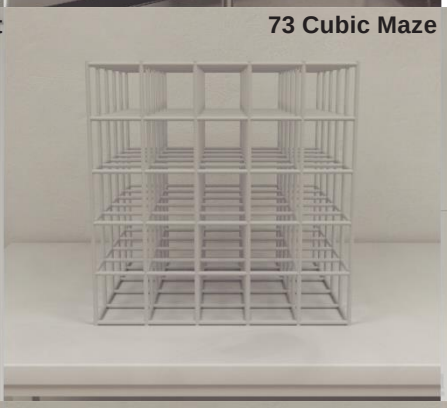

71 Morris Water Radial Tread

Discover: discover motor


71 Bowtie Mazes

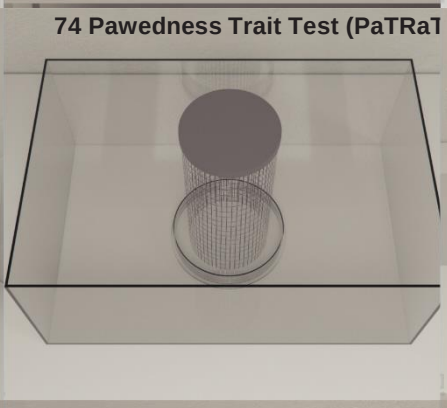

72 3D Radial Arm Maze

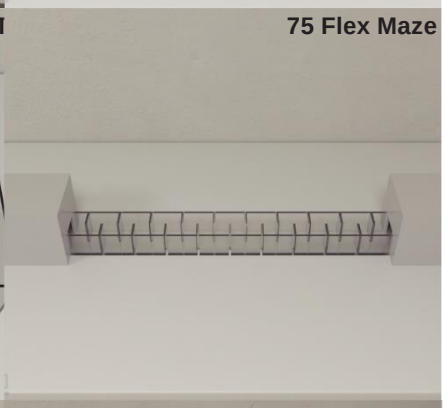

72 Social Interaction Test


73 Cubic Maze


73 Whisker Guided Exploration


74 Social Cooperation Chamber

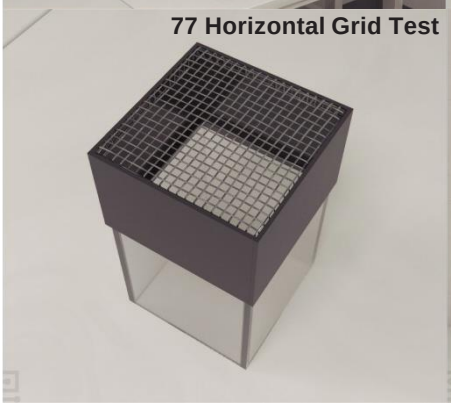

74 Pawedness Trait Test (PaTRaT


75 Flex Maze

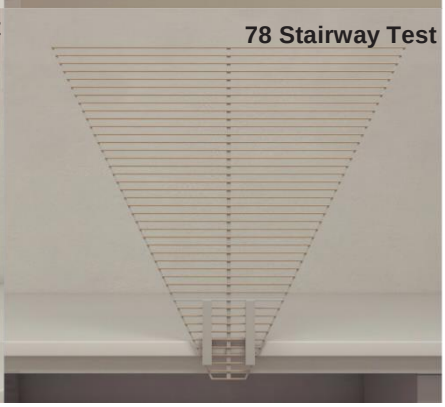

75 Climbing Tower: Resistance Exercise System


76 Incline Rolling Ladder


76 Grid Test


77 Horizontal Grid Test


77 Vertical Grid Test


78 Stairway Test

78 Emergence Test

79 Tilt Ladder

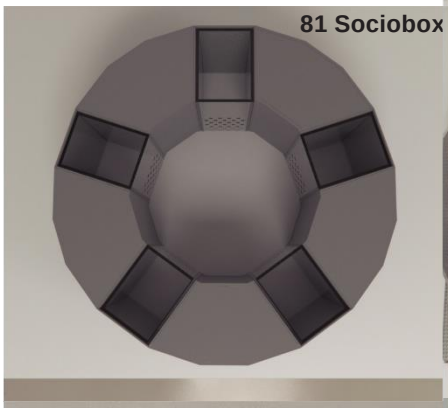
79 FTIR Walkway

Discover: discover social

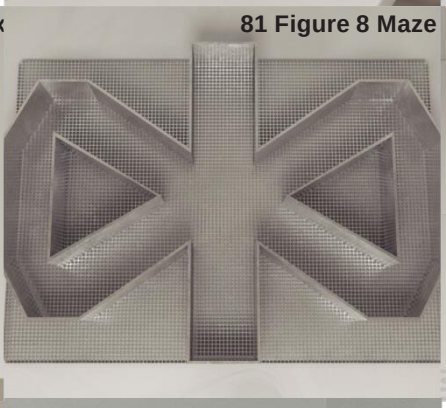
80 Water E Maze

80 Double T Maze

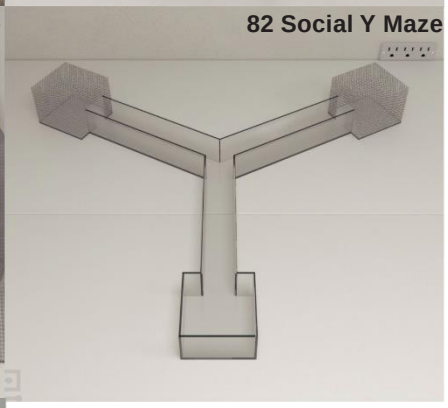
81 Sociobox



81 Figure 8 Maze



82 Social Y Maze



82 Marmoset Light Dark Box

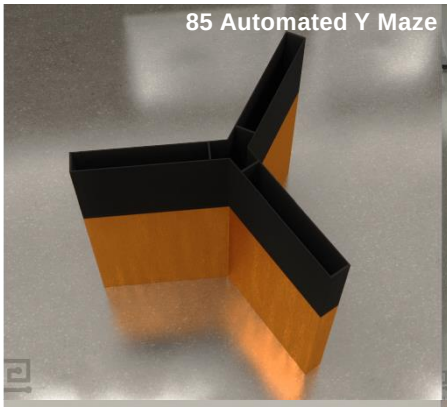
83 Stress Alternatives Model Maze

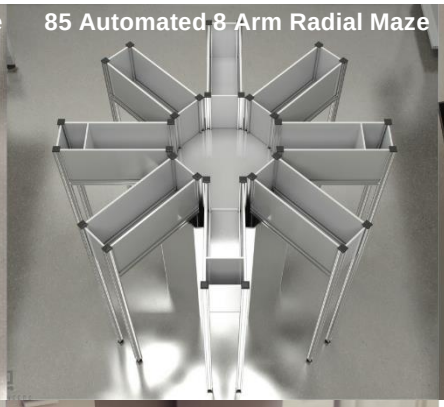
Automated mazes

83 Active Place Avoidance

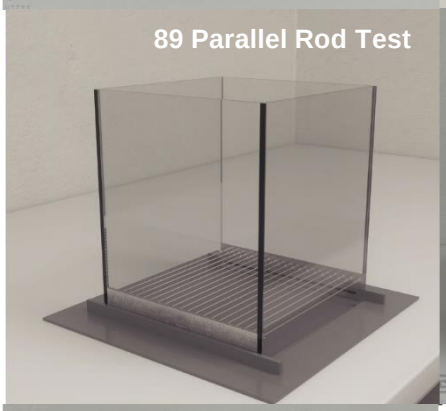
84 Automated Hole Board

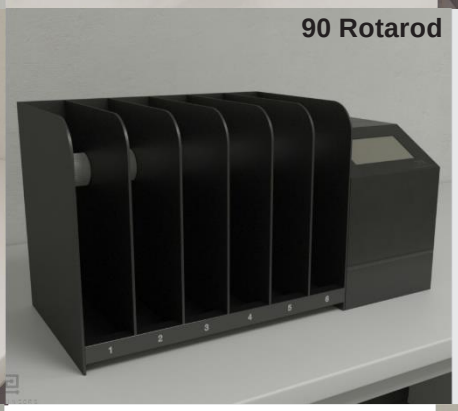
84 AeroDeliver System



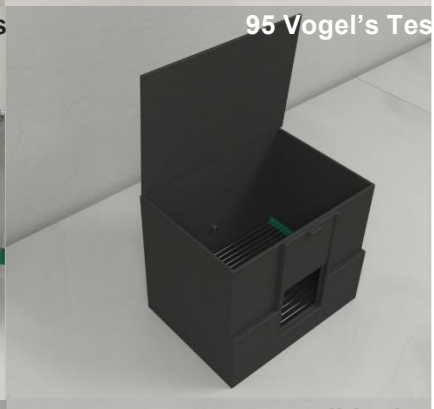


Activity:





Operant

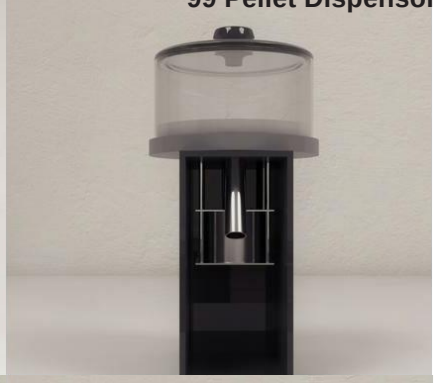


Operant: operant builder

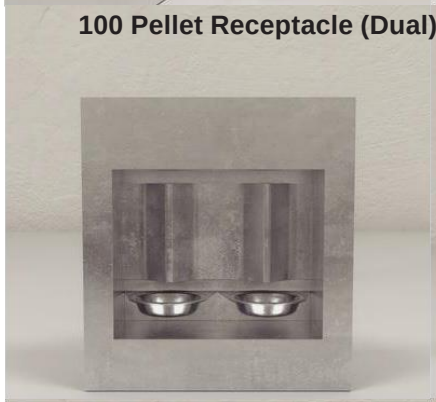
98 Operant Tall Frame

99 Operant Standard Frame

99 Pellet Dispensor



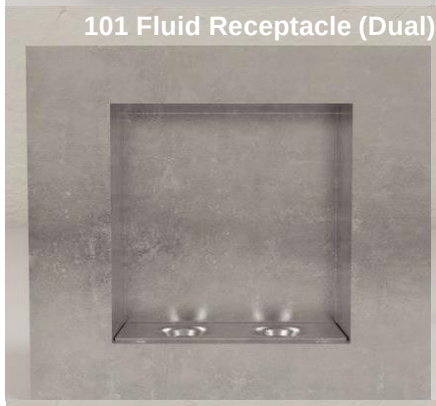
100 Pellet Receptacle (Dual)



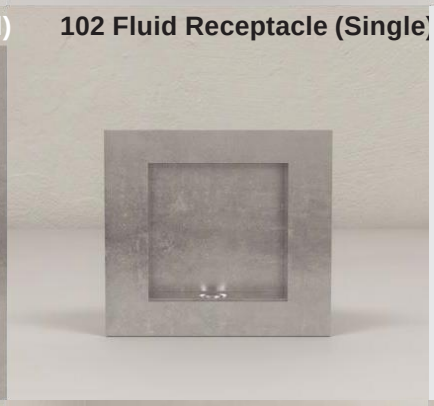
100 Pellet Receptacle (Single

101 Trough Receptacle

101 Fluid Receptacle (Dual)

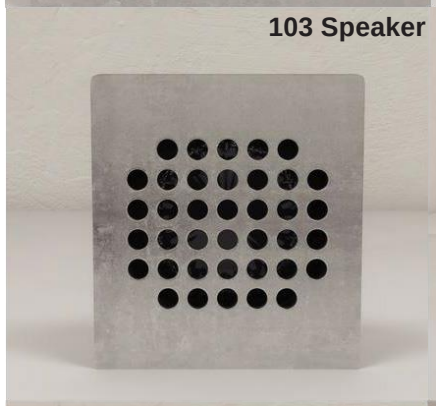


102 Fluid Receptacle (Single)



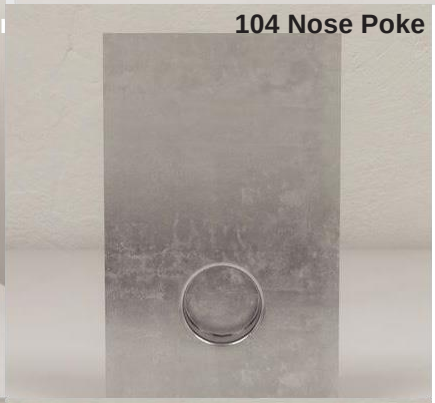
102 Omnidirectional Lever

103 Speaker



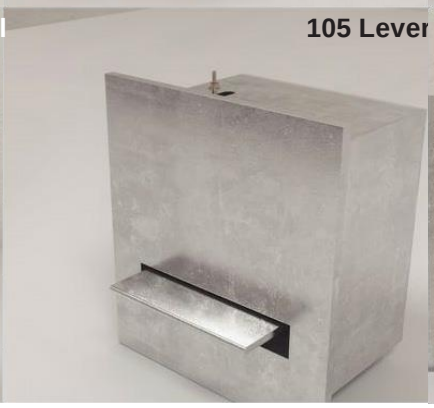
103 Liquid Dispenso

104 Nose Poke

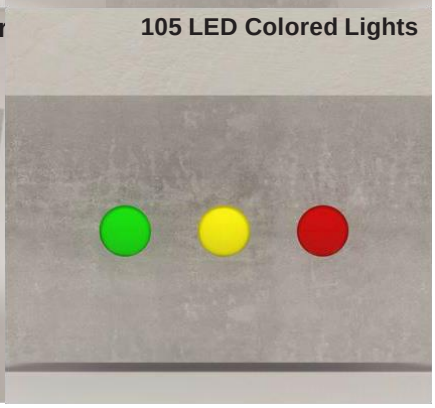


104 Response Wheel

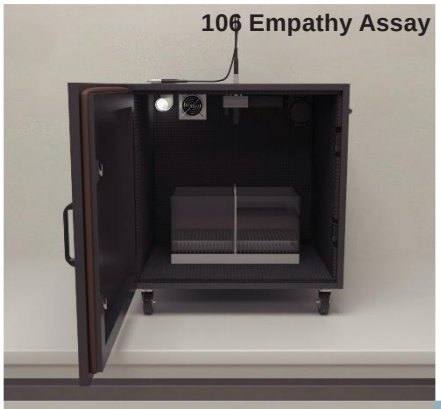
105 Lever



105 LED Colored Lights



Heat and Pain

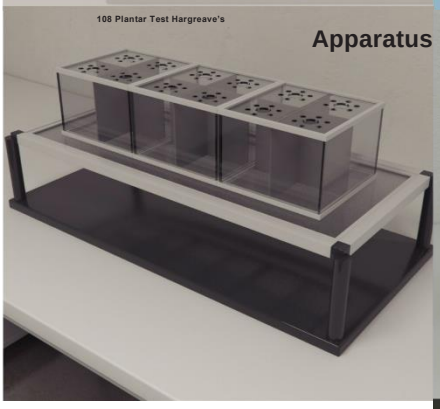

106 Empathy Assay

Device (OPAD)


107 Tail Flick Test

107 Electric Von Frey


108 Hot Plate



Apparatus

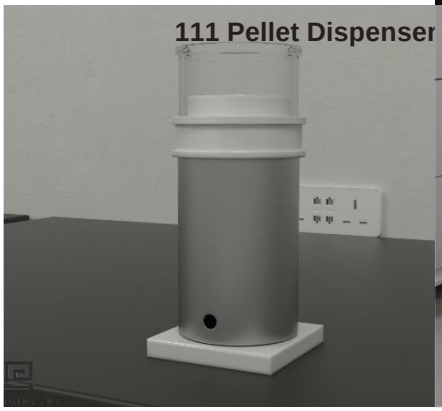

109 Hot/Cold Plate


109 Thermal Gradient

Accessories


110 Olfactory System


110 Lickometers


111 Pellet Dispenser


111 Gantry

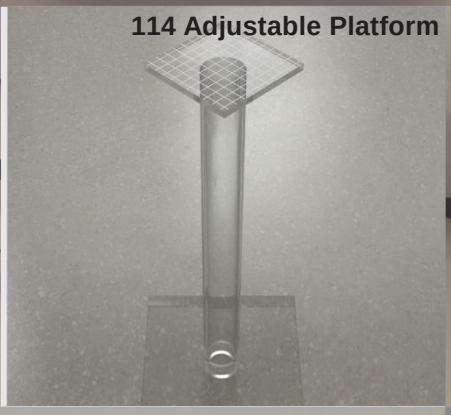

112 Casters


112 Maze Backlight


Chamber

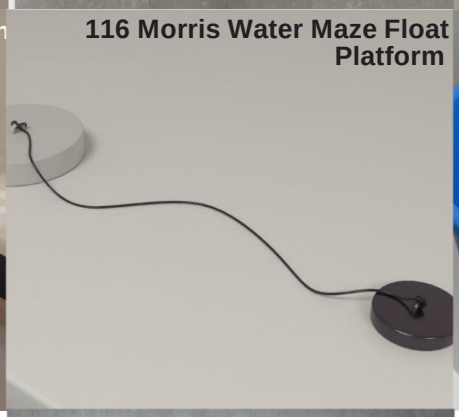

Arena


Maze Add On


114 Adjustable Platform


115 Sound Attenuating Chamber


On


116 Morris Water Maze Float Platform

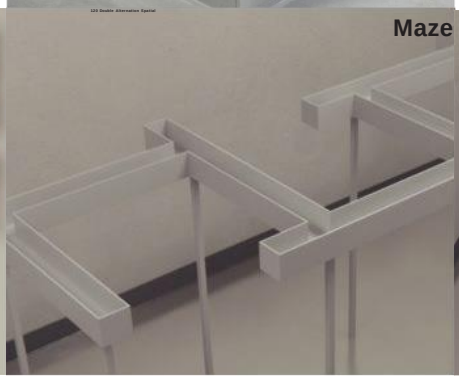

116 Morris Water Maze Heater

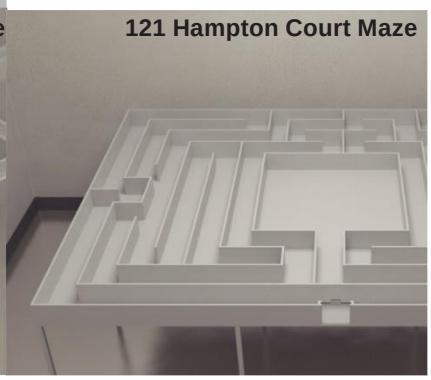
Discover

117 Labyrinth

Discover: historical mazes


120 Cincinnati Water Maze

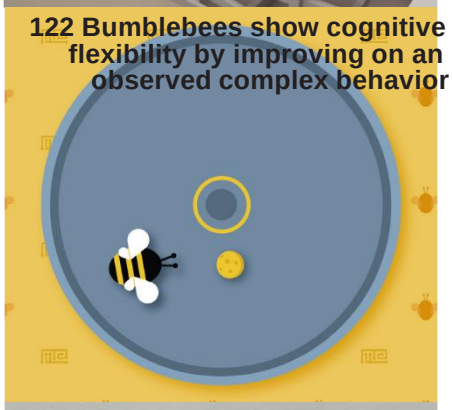

Maze


121 Hampton Court Maze


121 Tridimensional Maze

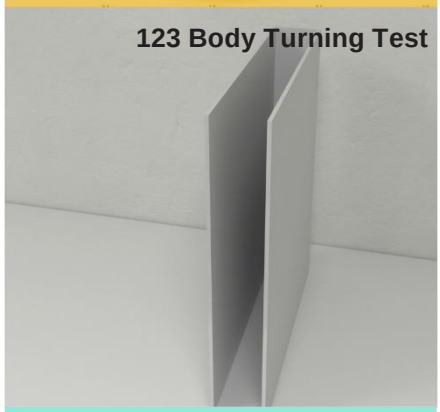
Discover: replication


122 Assessing Spatial Learning and Memory in Small Squamate Reptiles


122 Bumblebees show cognitive flexibility by improving on an observed complex behavior

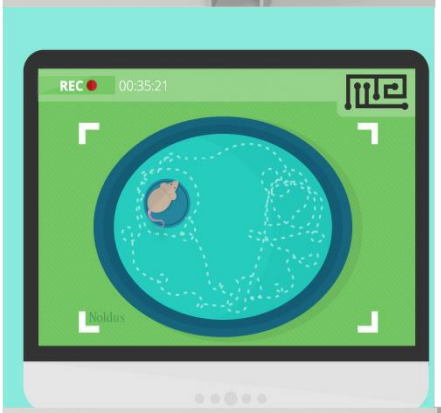
Discover: trims


123 Burrowing Tube


123 Body Turning Test

Software

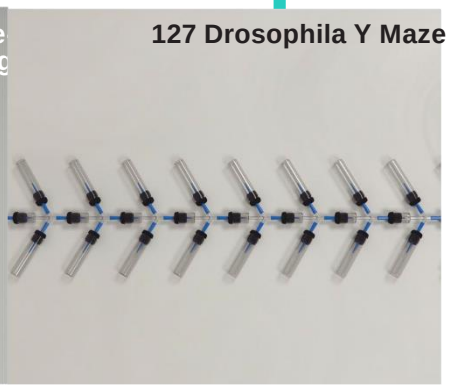

124 BehaviorCloud



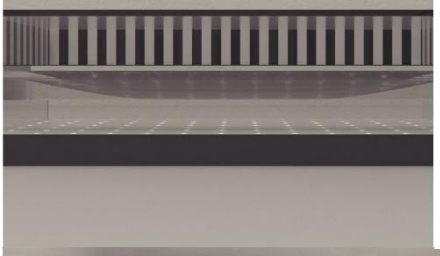
Drosophila


126 Drosophila Maze Array


126 Drosophila Olfactory Operant Conditioning


127 Drosophila Y Maze

127 Drosophila Shallow Chamber



Pigs

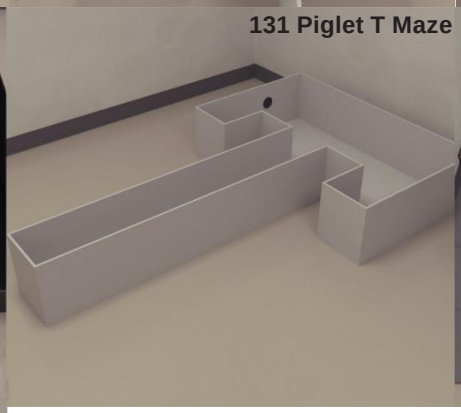
129 Pig Open Field

129 Pig Delayed Non-Match To Sample (DNMS) Task

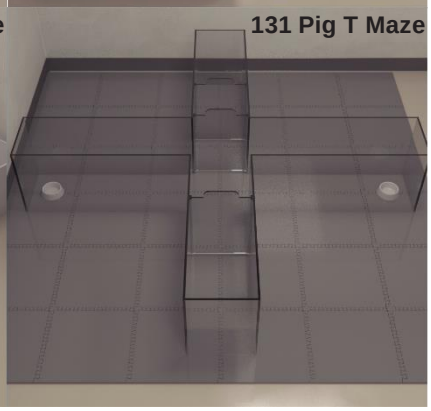
130 Pig Conditioned Place Preference

130 Pig Hebb-Williams Maze

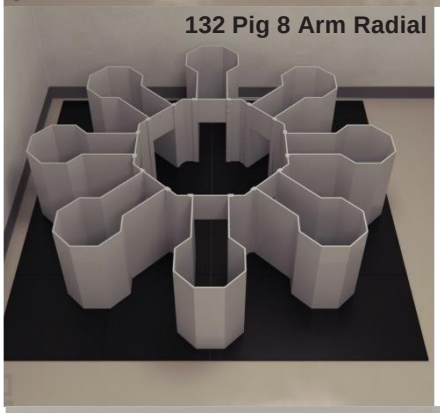
131 Piglet T Maze



131 Pig T Maze

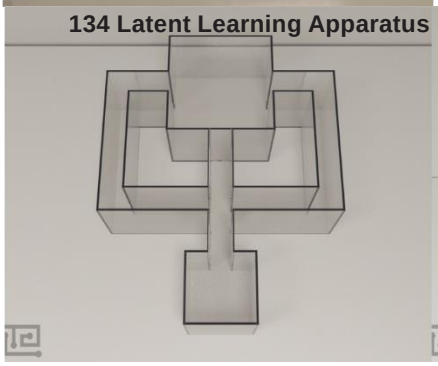


132 Pig 8 Arm Radial

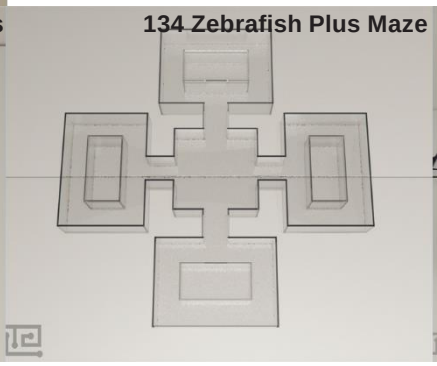


Zebrafish

134 Latent Learning Apparatus



134 Zebrafish Plus Maze

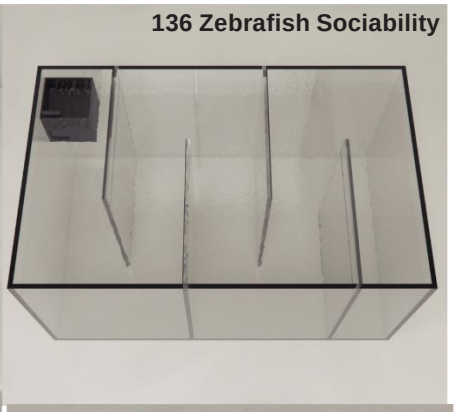


135 Zebrafish Shuttle Box

135 Zebrafish Light Dark

136 Zebrafish Black White Preference

136 Zebrafish Sociability



137 Mirror Biting Cattelan

137 Zebrafish Environmental Enrichment Chamber

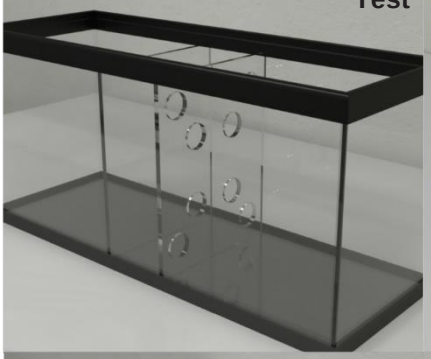
138 Mirror Biting Pham

138 Zebrafish Y Maze Flow Modification

139 Zebrafish Y Maze

139 Zebrafish Associative Learning

140 Zebrafish Place Preference Test

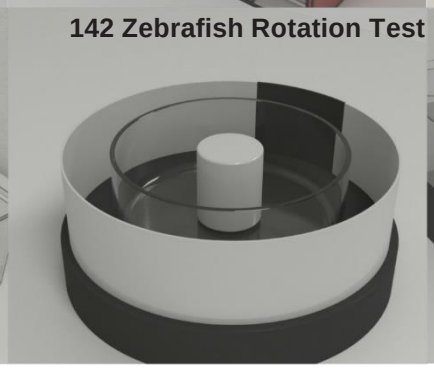


140 Zebrafish 3 Chamber Choice

141 Zebrafish Vertical Tank Array

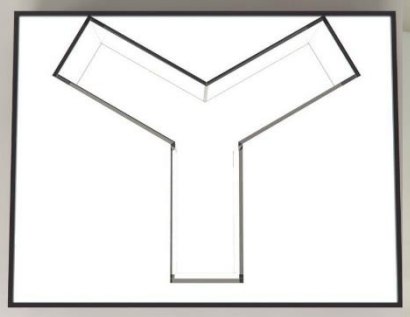
141 Zebrafish 5 Choice

142 Zebrafish Rotation Test

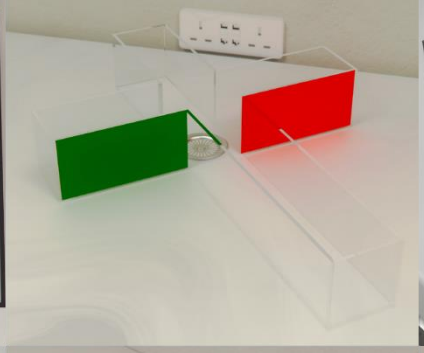


142 Zebrafish Tap Test

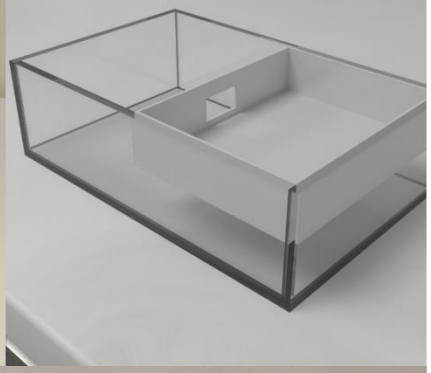
143 Zebrafish Y Maze Avoidance



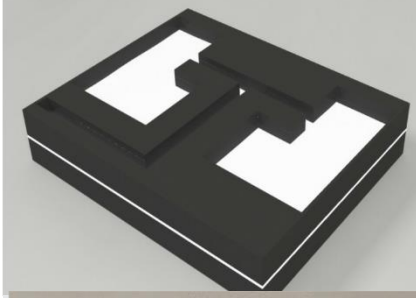
143 Zebrafish T Maze



144 Zebrafish Bite Test



144 Zebrafish Larvae T Maze



145 Mirror Biting Elwood

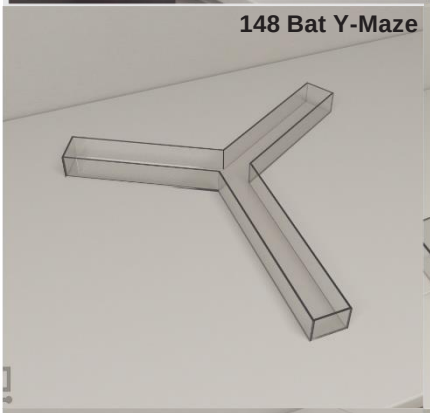
145 Mirror Biting Balzarini

146 Mirror Biting

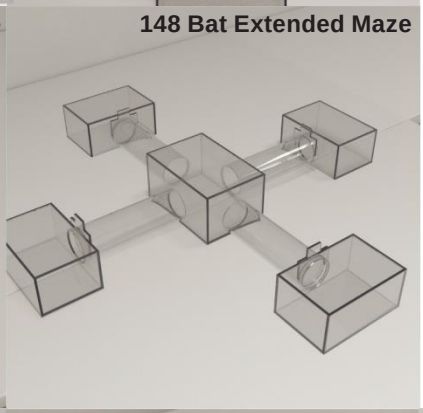
146 Zebrafish Bifurcating T Maze

Bats

148 Bat Y-Maze



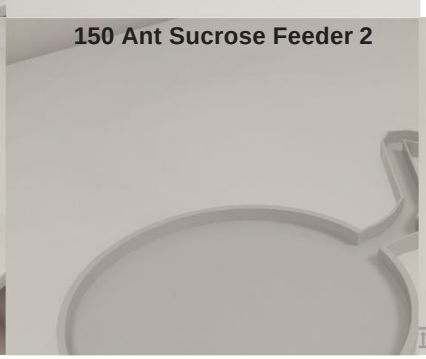
148 Bat Extended Maze



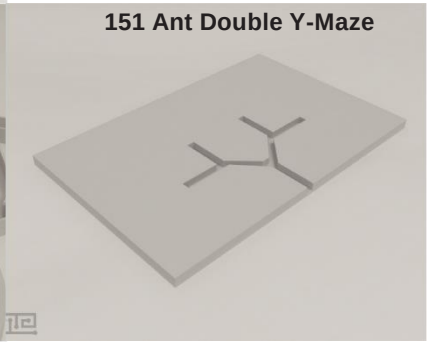
Ants

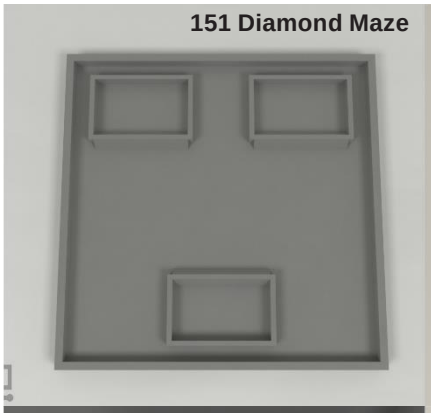
150 Ant Sucrose Feeder 1

150 Ant Sucrose Feeder 2



151 Ant Double Y-Maze



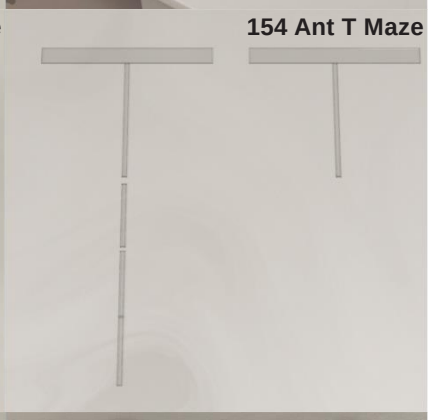

151 Diamond Maze


152 Psyllid Y-Maze

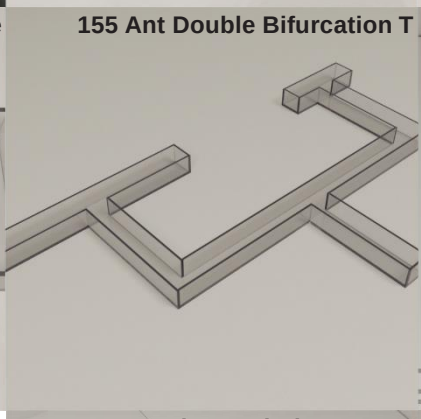

152 Caterpillar Y-Maze


153 Ant Binary Tree Maze


153 Ant Y Maze


154 Ant T Maze


154 Ant Colony Maze


155 Ant Double Bifurcation T

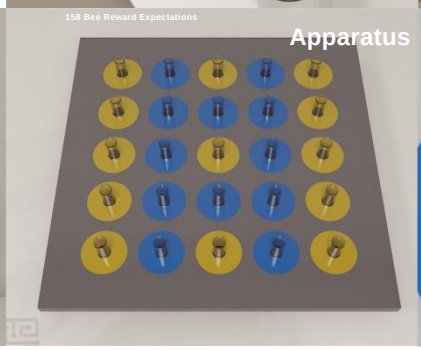

155 Honeybee Y Maze


157 Path Regularity Mazes

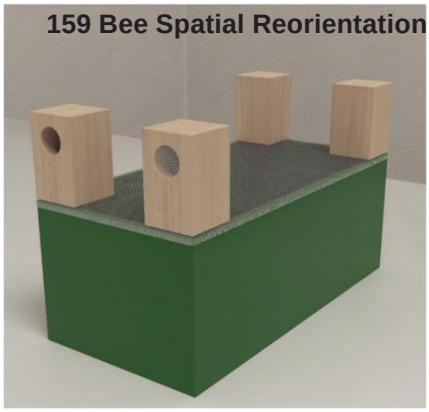

157 Bumblebee Y-Maze

Bees


158 Bee Radial Arm

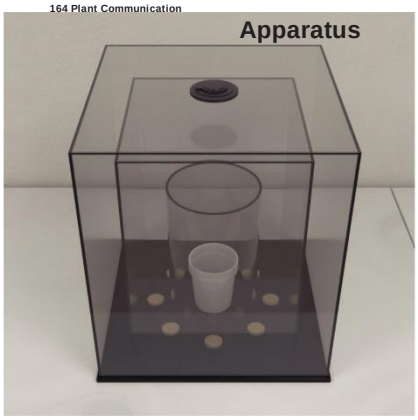

158 Bee Reward Expectations
Apparatus


159 Bee Soccer


159 Bee Spatial Reorientation

161 Human Vertical Maze

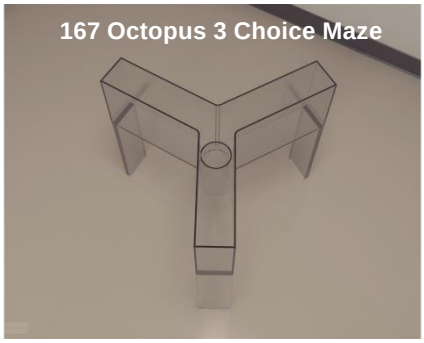
Plants


164 Plant Communication Apparatus


164 Plant Y Maze

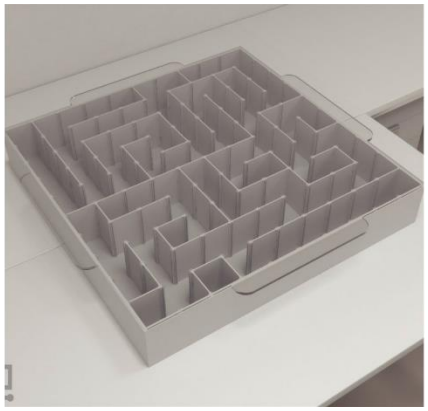

165 Mimosa Habituation

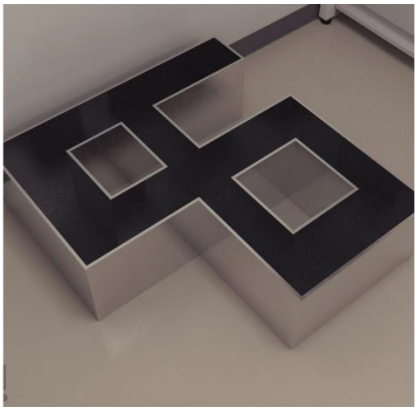
Cephalopods


167 Octopus 3 Choice Maze


167 Cuttlefish T-Maze


168 Octopus Round Arena





Our products

Features

	Downwards Facing Doors
	“Silent Mode”
	Strength & Durability
	ConducMaze Software
	Copper Shielding
	Optical Detection
	Secure lids

Integrations

	Integrated Lickometers
	Integrated Treadmills
	Integrated Feeders
	Housing Environments
	Shock Inserts
	Touch Screens
	Automated heat plates

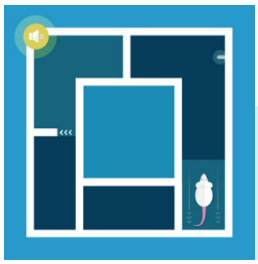
Features

Downwards Facing Doors

Downwards directing doors is ideal for tethered experiments, and ensures animal safety.

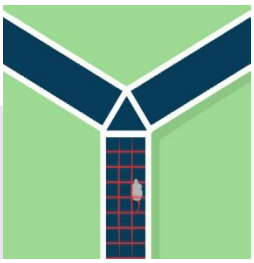
Copper Shielding

Copper shielding allows for maximized data collection in electrophysiology experiments . Please inquire about this option.



“Silent Mode”

The maze functions with very little sound to minimize startle, anxiety, and maximum exploration within the maze.

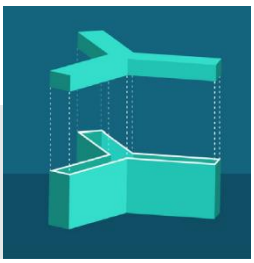


Optical Detection

24/7, 99.9% accurate optical detection with easy to configure actionable responses to movement.

Strength & Durability

Complete trust in how long the maze will last–made of high quality, but also light weight aluminum with thick acrylic parts ensures both ideal animal environments and maximum strength for long lasting mazes.



Secure lids

Lids can be configured to create safe, secure environments.

ConducMaze Software

Our ConductMaze software allows for OpenAPI access, allowing for quick and easy modifications and plugin creation to infinitely customize your maze. Each custom ordered maze comes with 1 free plugin creation.

Multiple Colors Available

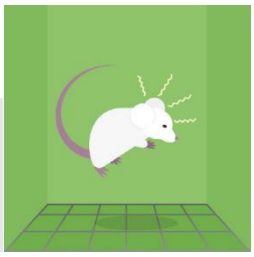
See page 14 for a sample of our colors.

Integrations

Integrated Lickometers

Integrated Lickometers allow for sucrose and reward preference tasks.

Shock Inserts



Safe shock grids can be built into flooring and walls to maximize learning experiments.

Integrated Treadmills

Integrated treadmills allow for exercise, metabolic, and fatigue tasks.

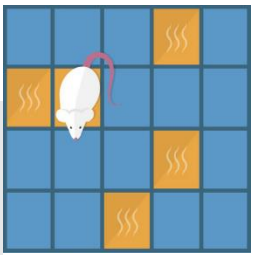
Touch Screens

Touch screen end inserts can be created for complex intramaze cues.

Integrated Feeders

Integrated feeders allow for pellet rewards and reward preference experiments.

Automated heat plates



Automated heat plates can be inserted anywhere in the CPP chamber.

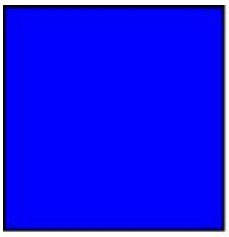
Housing Environments

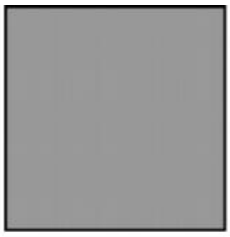
Integrated living environments allow for long term experimental tasks.

Noldus EthoVision XT

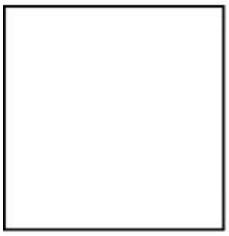
Please see page 26 for more information.

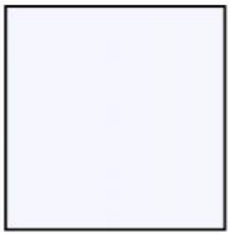
Colors available


Blue


Grey

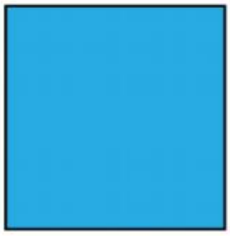

Black


White

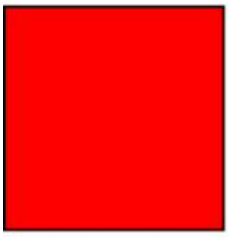

Clear

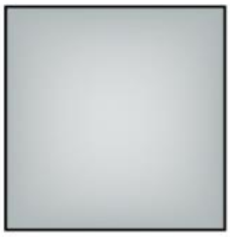

Dark grey


Dark blue


Light blue

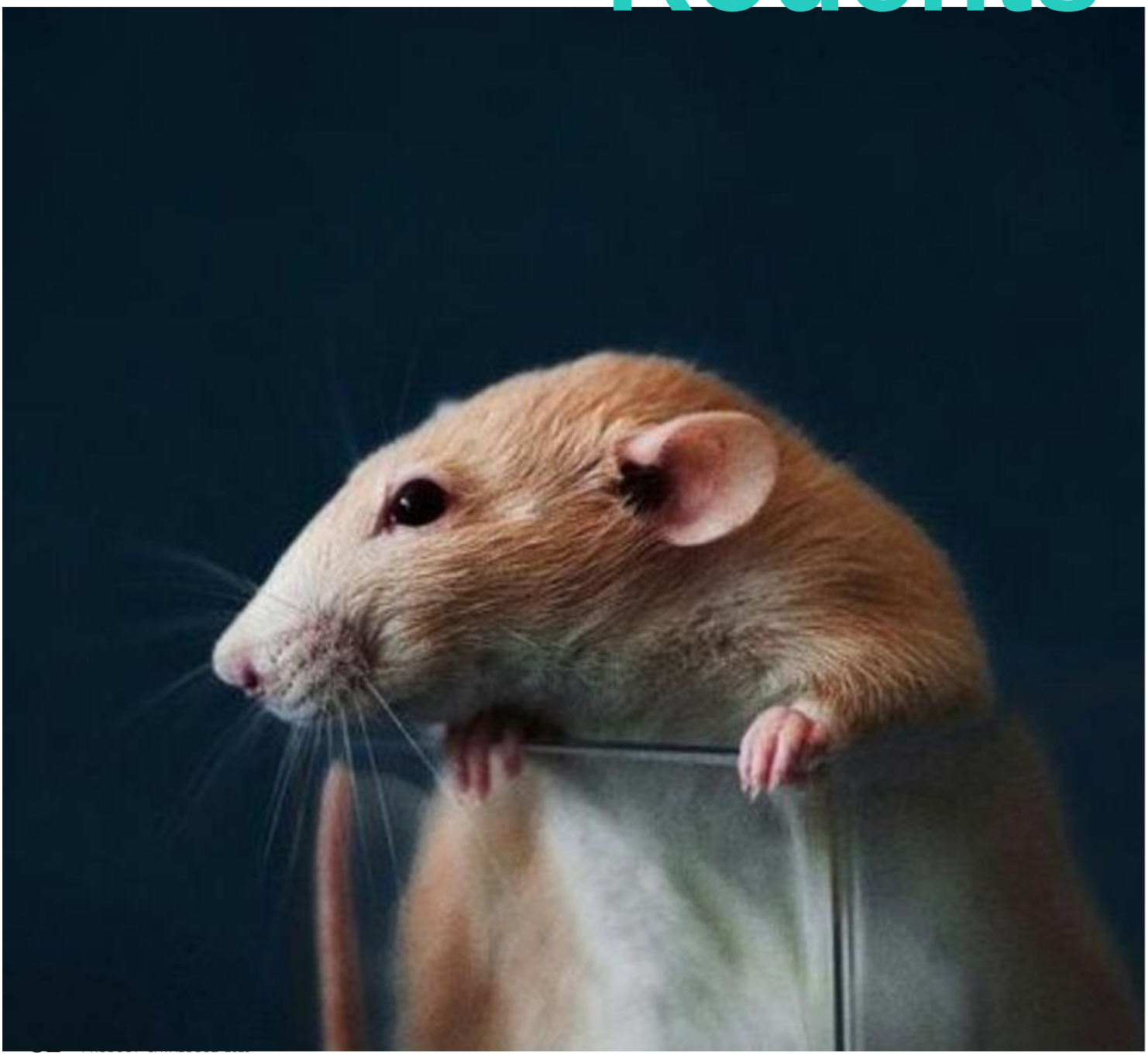

Green


Red


Metalic silver


Brown

Rodents



Dig Task

The Dig Task was formally described by Martins et al (2013) to describe a simple experimental preparation that can assess deficits in rats with bilateral frontal cortical damage compared to rats with unilateral parietal damage. The Dig task is a wonderful test in a comprehensive cognitive test battery. The basic protocol utilizes a basic scent discrimination paradigm in order to assess deficits in cognition. The MazeEngineers kit includes the apparatus, 2 ceramic cups, as well as multiple premixed sand odor kits to easily start your experiment.

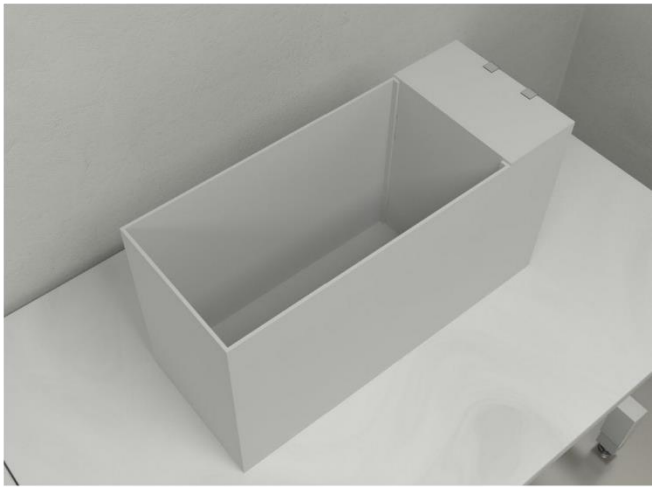
Includes scented sands: cocoa, basil, cumin, coffee scented and mixed with clean sand. 1 g odorant to 110 g unscented, clean sand.

Suggested Color

Black, Grey, Blue

Available

Mouse **Rat**



Puzzle Box

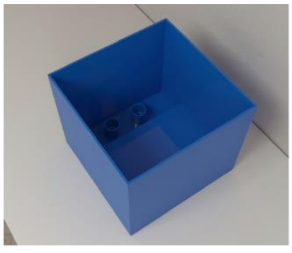
The puzzle box was described by Deacon and colleagues in 2011 as a variant of the work of (Galsworthy et al., 2002, 2005). Mice are placed in a brightly lit compartment and quickly develop preference for a smaller dark goal compartment due to light/dark motivation.
Mice are challenged with various interruptions of increasing difficulties and are tasked to adopt solutions to each new problem. The arena consisted of a Plexiglas white box divided by a removable barrier into two compartments: a brightly-lit start zone and a smaller covered goal zone. A narrow underpass is located under the barrier and multiple variants have been described as obstacles to be removed:
Variant 1: Sawdust
Variant 2: open
Variant 3: plug (small cardboard piece)
Variant 4: Weighted obstacle

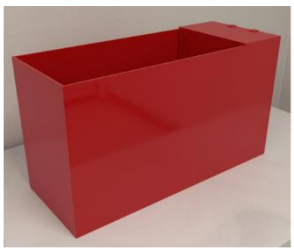
Suggested Color

Default Color: White. Additional Colors: Black, Clear, Grey, Blue, Red, Yellow

Avalable

Mouse **Rat**





Attentional Set Shifting (IDED) Chamber

The IDED chamber for the attentional set shifting task for mice and rats includes a chamber for convenient testing of individual rodents. The kit comes complete with the entire medium and odor set for testing up to 500 Trials. Convenient and easy to clean ceramic cups (8) allow for multiple tests and rotating chambers before cleaning in the testing in chamber.
Digging Odor kit comes with the following odors (500 Trials): Nutmeg, Rosemary, Cinnamon, Clove, Red thyme, Ginger, Vanilla, Lemon, Raffia, Foam
Digging Medium Kit comes with the following mediums (500 Trials): Felt, Paper, Pom-Poms, Sequins, Pipecleaners, Googleyeyes, Ribbons, Mettalic Strips, Citronella, & Digging Medium enough for 300-500 trials.

Suggested Color

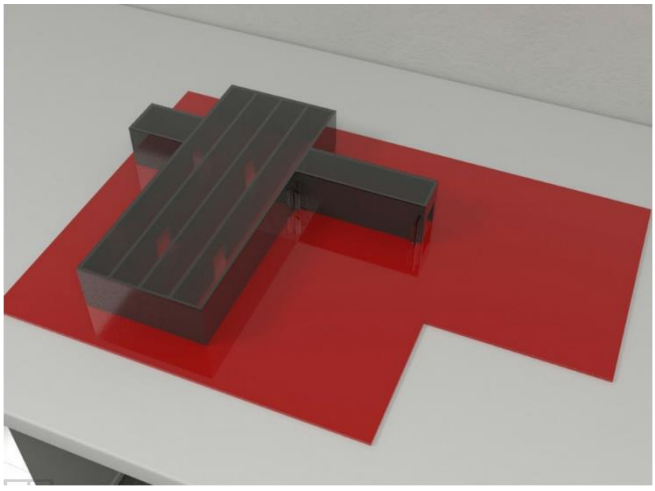
Black, Grey, Clear, Blue

Kits

•Full Medium Kit
•Full Odor Kit

Available

Mouse **Rat**



Lashley III

The Lashley III maze is a test used for learning and memory. It utilizes a low stress environment and looks into route learning of a maze under repeated trials. In typical protocols, no stress, food deprivation, or other stimuli are used. A start box, a maze body, and a goal box are contained in the MazeEngineers apparatus. The goal box can be filled with bedding similar to a home cage for reward for mice to motivate completion of the task. A large red base is not included in the order, but can be ordered upon request.

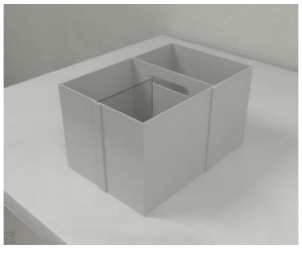
Suggested Color

Clear rooftop
Options: Red, Yellow, Blue, Black, Clear, White, Grey, Green

Base does NOT come with the Lashley by default

Available

Mouse **Rat**



Repeated Acquisition And Performance Chamber

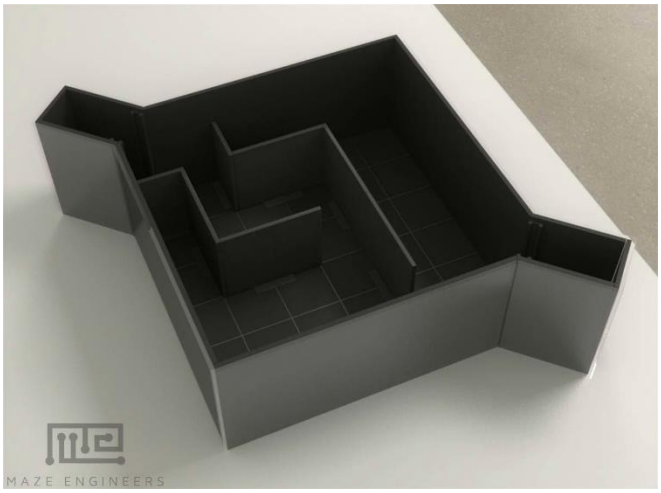
The Repeated Acquisition and Performance Chamber from MazeEngineers (RAPC for short) is an acrylic device with a start and end goal box. The interior main body consists of five compartments with four transparent panels. One way doors separate each of the compartments allow access to successive compartments. Correct entry to the final destination/goal box allows access to a reward determined by the experimenter.

Suggested Color

Clear

Available

Mouse **Rat**



Hebb Williams

The Hebb-Williams Maze is a behavioral task used for studying spatial working memory animals. It was observed that rodents have a remarkable ability to learn spatial locations, especially when baited with food rewards, and this has been adapted into a behavioral task. The maze consists of a square area with moveable internal walls, allowing the maze to be configured differently for each trial. There are six acquisition maze layouts and twelve testing maze layouts in the Hebb-Williams Maze battery. This task requires use of spatial working memory, and this ability to learn and remember the path through the maze can be effected by the administration of certain drugs or disease models.

Suggested Color

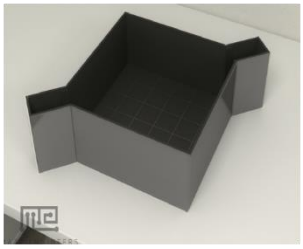
Dark grey

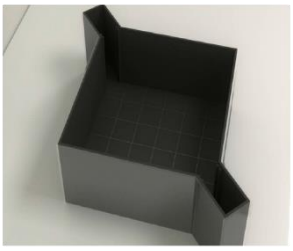
Modifications Available

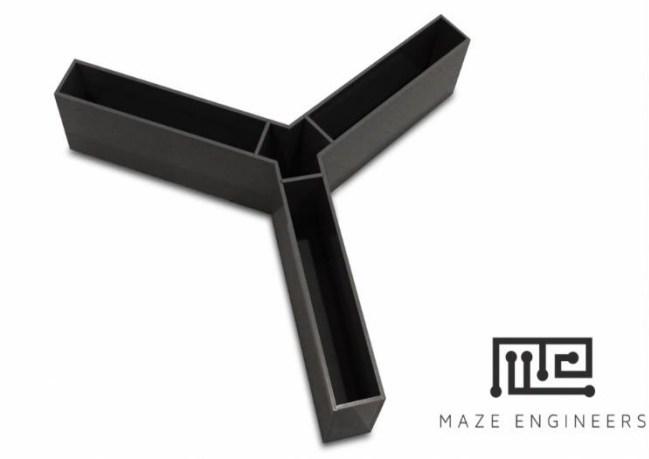
- Extra Doors
- Extra Wall Height 40cm
- Extra Wall Height 50cm

Available

Mouse **Rat**







Y Maze

The Y maze is similar to the T maze, except with three arms at 120 degrees to each other. The rodent or mouse starts at the end of one arm, then chooses between the other two. Spontaneous alternation is measured to demonstrate learning.
The Y-maze is often preferred to the T-maze because gradual turns decrease learning time as compared to the sharp turns of the T-maze. It is also a smaller maze* to allow less degrees of freedom of movement, focusing the animal on the task at hand.
The Y Maze can also be baited with food for rewarded alternation. Food wells are standard 1cm deep.

Suggested Color

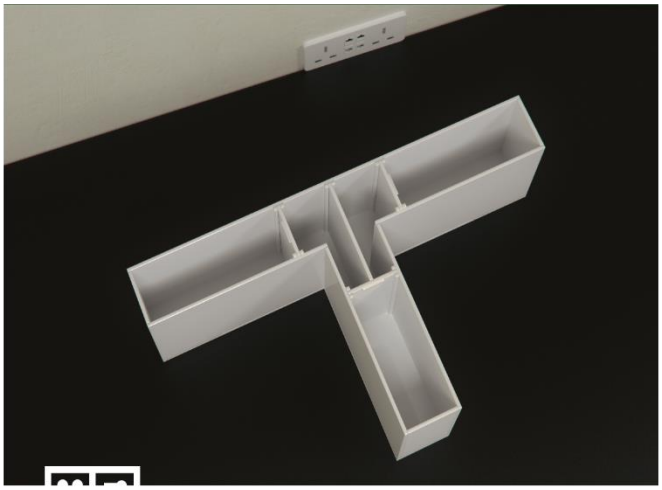
Black, Grey, Blue

Modifications Available

•Doors
•Water Sealant
•Escape Tubes (3) for Mouse and Rat
•Food Wells
•Stand for Mouse and Rat

Available

Mouse **Rat**



T Maze

The T maze is an enclosed apparatus in the form of a T placed horizontally, similar to the Y maze. Animals usually start from the base (long arm) of the T and allowed to choose one of the goal arms. The test relies on either spontaneous alternation or rewarded alternation.

Suggested Color

White, Grey, Clear

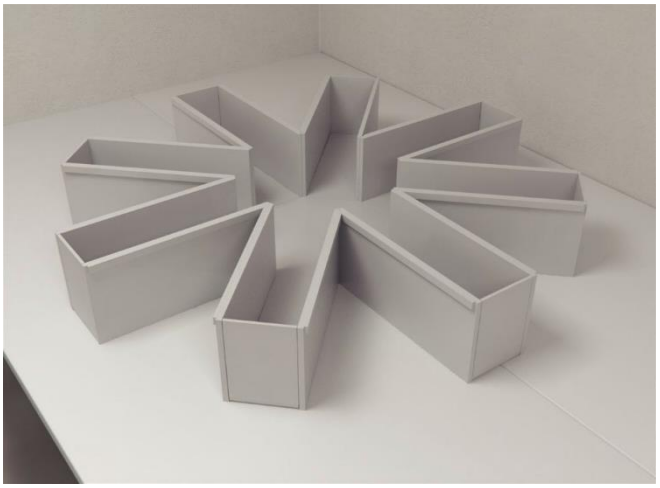
Modifications Available

•Food Wells
•Doors (Guillotine)
•Stand for Mouse and Rat

Available

Mouse small **Mouse**

Rat



Radial Arm Maze

The traditional eight radial arm maze has many variants that allow mice, rats, and even primates to display their spatial working memory for the arms that they have visited by avoiding re-entry.
Typically, they do so by relying on their memory for the spatial location of visited arms relative to extramaze landmarks in the testing environment. Extramaze and intramaze cues are key to this process.
Separate protocols include the spatial working memory and spatial reference memory tasks.

Suggested Color

White, Clear

Modifications Available

•Food Wells
•Light Cues
•Doors for 8 Arms
•Goal Box
•Removable Model

Available

Mouse **Rat**

Morris Water Maze

The Morris water maze consists of a round tank (pool) of water or milk with a hidden platform for the animal to locate. It is one of the best assays for spatial learning and memory in laboratory rodents, and is at the center of contemporary neuroscience research. Water or milk removes olfactory cues and provides motivation for movement. The interior is smooth to minimize allothetic cues.
The hidden platforms are included in your order.

Suggested Color

Blue, Black, White

Modifications Available

•Adjustable Platform for Mouse and Rat
•Steel Frame with Casters for Mouse and Rat
•Radial Arm Insert (8 arm)
•Radial Arm Insert (6 arm)

Available

Mouse small **Mouse**

Rat

Successive Alleys

The Successive alleys test is a novel anxiety test that utilizes fear of open spaces as an assay. The most distal regions are white, open and narrow, which creates an anxiogenic environment. The most proximal, dark areas create anxiogenic areas that encourage natural aversion of open spaces. The MazeEngineers successive alleys apparatus allows for easy attachment to laboratory benches. The entire assay can be detached to easy storage and cleaning.

Suggested Color

Black, Grey, White

Available

Mouse **Rat**

Tail Suspension

The tail suspension test is a standard test of depression. Mice and Rats are hung to the apparatus and time struggling is an approximate measure of depression. Escape oriented behaviors are quantified during measurement. The tail-suspension test is a highly validated test for potential antidepressant pharmaceutical compounds.

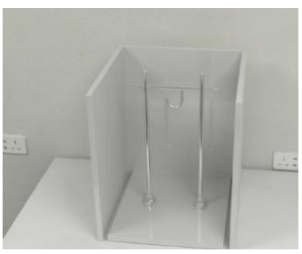
Suggested Color

Grey

Available

Mouse **Rat**

Mouse set of 3



Elevated Plus Maze

The elevated plus test is one of the most widely used tests for measuring anxiety-like behavior. The test is based on the natural aversion of mice for open and elevated areas, as well as on their natural spontaneous exploratory behavior in novel environments. This test has a strong validity profile for anxiolytic drug validation and screening. All open end arms include 1cm high end plates to ensure the mice do not fall off the maze during exploration.
Variation 2: a variation of the elevated plus maze is the elevated cross maze, which utilizes a clear central area with 4 door partitions.

Suggested Color

Black, Grey, Clear, Blue

Modifications Available

- Doors
- Extra Wall Height 40cm
- Extra Wall Height 50cm

Available

Mouse **Rat**

Barnes Maze

The Barnes maze is a circular maze designed to test visual spatial learning and memory for mice and rats. It consists of an elevated circular platform with 18 holes (which can be customized) evenly spaced around the perimeter.
Mice & rats are motivated to escape both the bright light and the open maze floor to enter the holes on the perimeter with a dark escape box beneath it. Shallow, trap holes line the other holes.
The entire top can be rotated around the central partition. Separately, the dark escape box can be rotated underneath the table. Animals use intramaze or extramaze visual cues (not included) to find the spatial location of the escape hole. There has recently been an increase in the usage of the Barnes maze because of advantages over the 8 arm radial maze and the Morris Water Maze, as it avoids the water environments and other stressors.

Suggested Color

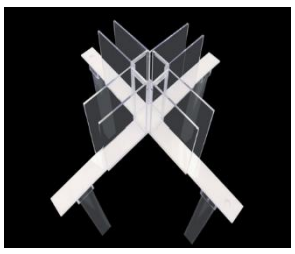
White, Grey, Blue

Modifications Available

- Extra Nest
- False Floor Add on

Available

Mouse **Rat**



Zero Maze

The Zero is an elevated ring-shaped runway with the same amount of area devoted to adjacent open and closed quadrants, with increasing usage in recent years. It is very similar to the elevated plus maze, but with the center region of the elevated plus maze removed. It has been pharmacologically validated with various anxiolytic drugs.
The design is created with an elevated circular platform with two walled, enclosed portions as well as two open portions, allowing for clear interpretations of murine behavior. Because mice tend to avoid open spaced areas, the animals will preferentially spend more time in the enclosed walled area.

Suggested Color

Black, Dark Blue, Blue

Modifications Available

•Doors (<4)
•Additional Height of Walls 40cm
•Additional Height of Walls 50 cm

Available

Mouse **Rat**

Forced Swim Test

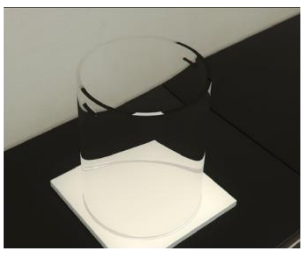
The forced swim test (FST) is one of the most commonly used animal models for assessing antidepressant-like behavior.
The forced swim test involves the scoring of active movements such as swimming and climbing vs. passive immobile behavior while swimming in a cylinder from which there is no escape. A wide range of antidepressant treatments have been shown consistently to reduce the amount of immobility time while increasing active escape behaviors.

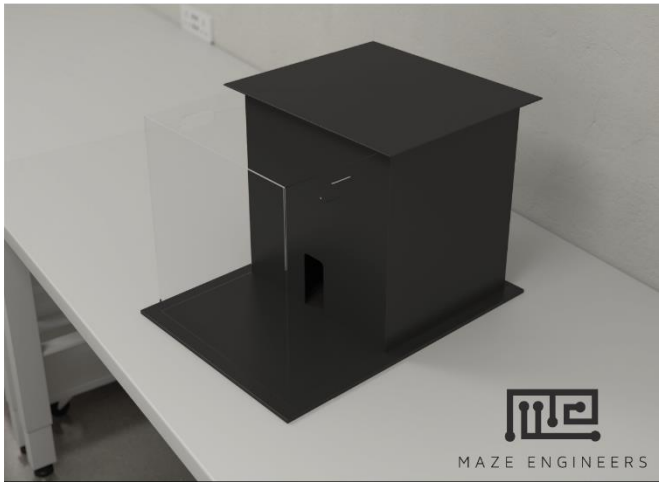
Suggested Color

Clear

Available

Mouse **Rat (d=25)**
Rat (d=30)





Light Dark Box

The Light/Dark box is extensively used to test anxiety-like behavior.
This test assesses the animal's reaction to the aversive and anxiety prone context of being in a brightly illuminated area.
Different groups have adapted this test in order to collect data regarding different aspects of anxiety-like behavior.
Animals in anxiety models spend less time in the bright chamber, while in comparison, animals receiving anxiolytic treatment show an increase in the time spent in the bright area.
The maze has been used to study anxiety and the effect of diseases and treatments on anxiety.

Suggested Color

Black, Grey

Available

Mouse **Rat**

Hole Board

The modified Hole Board is a behavioral test used in neuroscience to assess multiple aspects of unconditioned behavior, cognition and social interaction. The MazeEngineers Hole Board comes with inserts of either 16 or 4 holes. The inserts are easily removable and can be used as an open field chamber for secondary experiments. The entire wall apparatus can be removed for easy cleaning.

Modifications Available

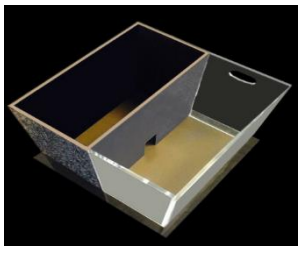
•A smaller board (35 x 22 x 1 cm) with 10 cylinders can be placed in the middle of the box for testing rats
•The box can be reduced in size to 50 x 50 cm for testing mice by inserting a partition

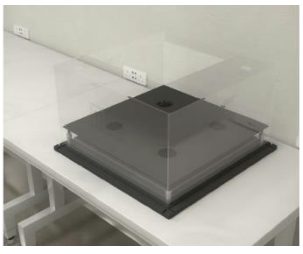
Suggested Color

Clear

Available

Mouse **Rat**





Novel Object Recognition

The popular Novel Object Recognition test based on the tendency for rats and mice to interact more with a novel object than with a familiar object. Animals are first placed in an apparatus and allowed to explore an object (not included in your order). After a prescribed interval, the animal is returned to the novel object apparatus, which contains the familiar object and a novel object. Object recognition is distinguished by more time spent interacting with the novel object.

Suggested Color

Black

Modifications Available

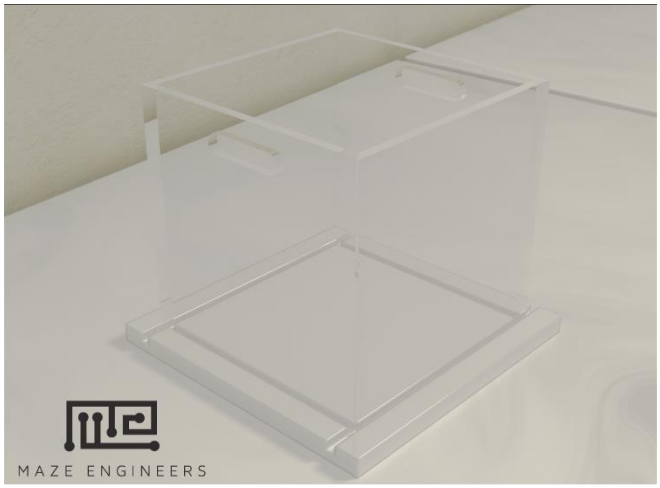
•Grid Flooring w/ Cover
•Floor Insert for Mouse and Rat

Available

Mouse **Rat** **XS (Stroke)**

Mouse Set of 4 **Rat Set of 4**

XS (Stroke) Set of 4



Open Field

Open Field test is a popular protocol used to assess exploratory behavior and anxiety. Thigmotaxis in the open field is used to evaluate anxiolytic, anxiogenic and even non-pharmacological treatments. Ambulation is the most common behavior studied with this maze, but others such as latency or rearing can also be measured. In addition, objects can be added for a modification similar to the novel object recognition field.

Suggested Color

Opaque white, Clear

Modifications Available

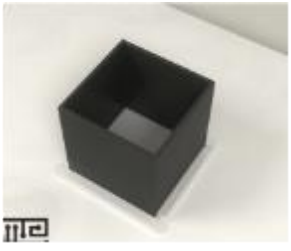
•Grid Flooring w/ Cover
•Floor Insert for Mouse and Rat

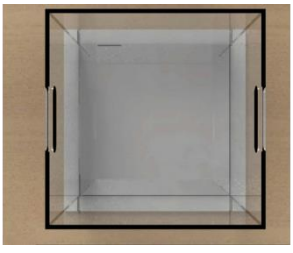
Available

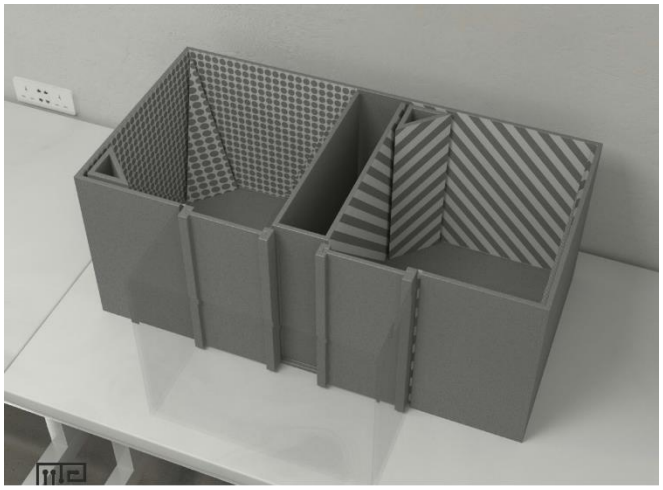
Mouse **Rat** **XS (Stroke)**

Mouse Set of 4 **Rat Set of 4**

XS (Stroke) Set of 4







Conditioned Place Preference

The conditioned place preference chamber is a paradigm is widely used to explore the reinforcing effects of natural and pharmacological stimuli, including drugs of addiction. Combinations of floor and wall cues are available.
In this variant, subjects are allowed to freely move between a compartment in which they were conditioned with either drug cues or neutral cues. The wall cues a (comes with maze) provide visual reinforcement.
This dual chamber place preference allows for biased and unbiased conditioned place preference testing. A removable door (not shown) allows isolation into one compartment of the apparatus of the animal. Preference testing is then done by removing the door to allow the mouse to freely explore between the two compartments.

Suggested Color

Grey

Integrations

Available

Mouse **Rat**

Gait Test

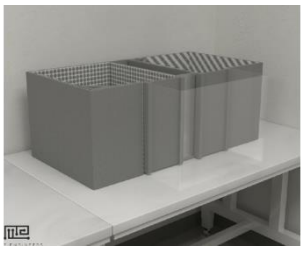
The gait test is a useful apparatus to measure motor lesions and other related dysfunction related to gait. The forepaw of the rodent is wetted with blue black ink (included in your order) and placed on one end of the runway, which is covered with a strip of paper. The stride length of forelimbs are measured manually as the distance between two forepaw prints. The MazeEngineers apparatus comes with an optional lighting apparatus to encourage motivation to the dark housing area. Sizing for mice and rats available.

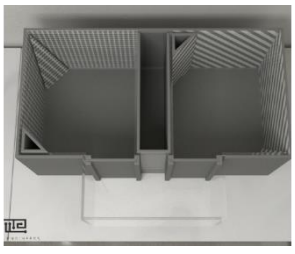
Suggested Color

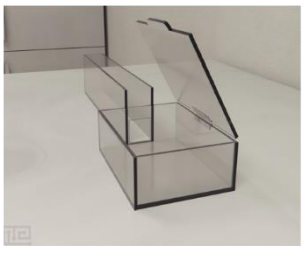
White, Grey, Black, Clear

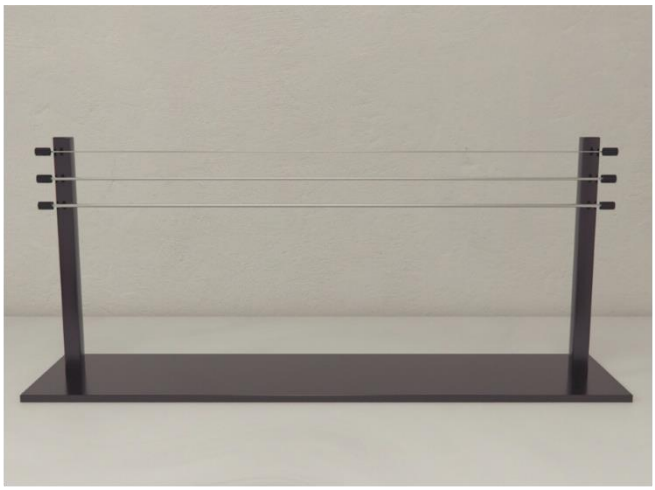
Available

Mouse **Rat**









Triple Horizontal Bars

Three bars made of stainless steel are included in your order for motor function in mice and rats. Total length is 8 cm long with three bar diameters available: 2, 4 and 6 mm. Multiple colors available. Each bar is removable and replaceable to use for your individual test. Customized diameters are available, please inquire for more details.
Height: 50 cm default. For custom size please inquire for more details.

Suggested Color
Black

Available

Mouse **Rat**

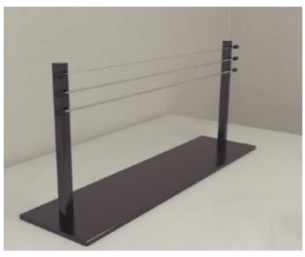
Static Rods

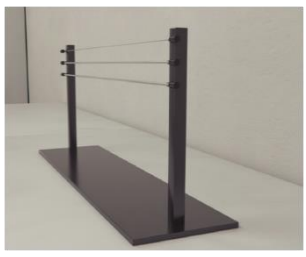
Five rods are included in the order. 35 mm, 28 mm, 22 mm, 15 mm and 9 mm width rods are included in your order for five total, each 60 cm in length. Each rod is fixed by a G-clamp to a laboratory shelf to assess motor function. The end of the rod near the bench has a mark 10 cm from the end, to denote the finishing line. The height of the rods above the floor is 60 cm.
OPTIONAL: If your laboratory does not have a 60cm bench, an optional wall with soft landing compartment can be ordered. Inquire for more details.

Suggested Color
White

Available

Mouse **Rat**





Parallel Bars

1 meter length metal bars 4 mm in diameter are fixed 30 mm (on their centers) apart by wooden supporting columns at their ends. Both Acrylic and wooden models available. The bars are 60 cm above the floor.
A small modification allows for the total length between the end supports to be adjustable, as the end supports can be moved inwards. Please inquire for more details.

Available

Mouse **Rat**

Skilled Forelimb Test

The skilled forelimb reaching task is a widely used motor assessment for mice and rats. Rewards include pellets and carbohydrates in the form of pasta, or press a lever for operant experiments. The Classic MazeEngineers Skilled forelimb apparatus allows for cost effective data collection with skilled reaching for pellets or other rewards. Both Mice and Rat configurations are available.

Suggested Color

Clear

Modifications Available

- Shock Grid
- Reward Pellets
- Custom Sizing

Available

Mouse **Rat**

Horizontal Ladder

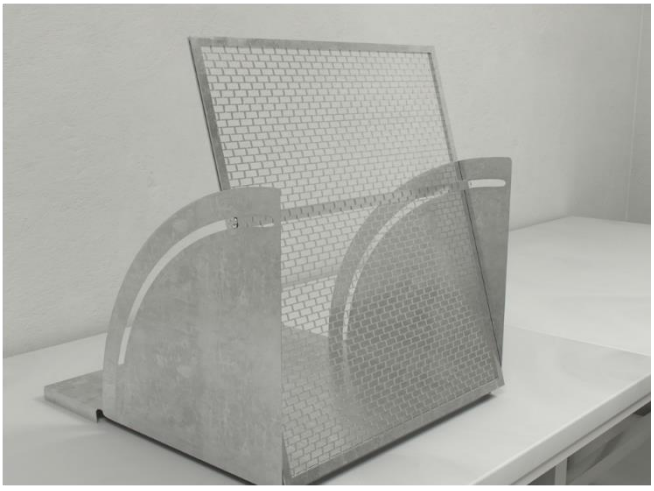
The Horizontal Ladder test is a motor and coordination test for evaluate skilled walking for mice and rats. Steps are counted and classified as either correct/functional paw placement, a slip, or a miss. Fore & hind-limb coordination can be assessed further by removing individual ladder rungs to evaluate how the rodent targets individual rungs. The animals are required to walk on a horizontal rung ladder spontaneously with varied spacing between rungs. The MazeEngineers horizontal ladder allows for removal of individual rungs. Flexibly made to clamp to end plates to allow for aversive or rewarded locomotion. Clear walls allow for easy video recording.

Suggested Color

Clear

Available

Mouse **Rat**



Geotaxis Test

The geotaxis test is used to investigate motor coordination and vestibular sensitivity in rodents. The rodent is usually placed in an inclined grid in the head downwards position. The grid allows for grip and allows for the rodent to reorient itself towards an upwards position. Both acrylic and stainless steel versions are available through MazeEngineers. The larger angle creates a more difficult barrier towards reorientation. Shallower angles allow for easer geotaxis.

Suggested Color

Grey

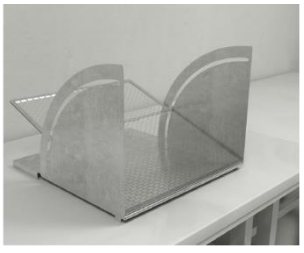
Available

Metal:

Mouse **Rat**

Acrylic:

Mouse **Rat**



Balance Beam

The balance beam is a narrow ‘walking bridge’ for mice / rats to walk across to test sensorineural balance and coordination. The beam generally sits between two elevated platforms with platforms to hold either mice or rats. Interchangeable beams can be used in thinner and thinner intervals.
The essential components include
-End platform
-Beams

Suggested Color

Black, White

Modifications Available

•Start Platform
•Encatchment: A soft encatchment to prevent harm on the fall

Available

Mouse **Rat**

Empathy Assay

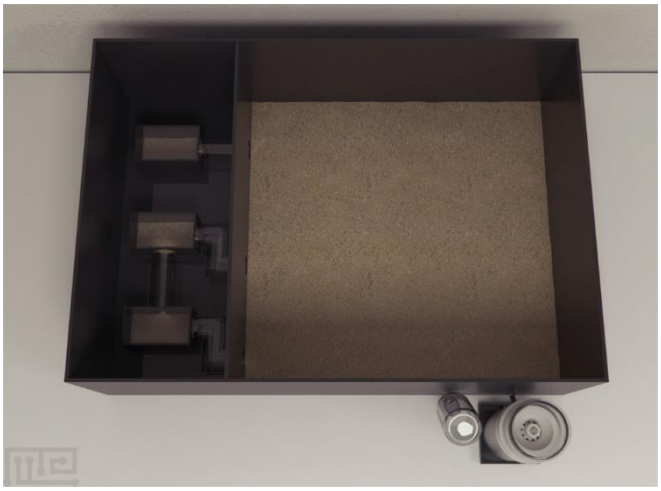
The empathy assay was first described in the literature by Jeon et al (2011) and is an excellent tool to interrogate observational fear. The MazeEngineers apparatus comes with two key components: A double chambered acrylic chamber with two foot shock controlled grids, each of which can be controlled independently with our free Conductor Software. This apparatus is then placed inside of a standard, basic isolation chamber. Upgrades in this chamber to include sound and light cues can be done. Please inquire for more information.

Suggested Color

Clear

Available

Mouse **Rat**



Visual Burrow System

Each colony in the Visual Burrow System is housed in a rectangular acrylic chamber. Three chambers are positioned behind a barrier wall in the burrow area, with a wall separating it from the open area. These chambers are connected to and opened through the wall via clear Plexiglas tubes. Two of the three chambers, each connected to the “surface” area via a “Z” shaped tube, are connected to each other via a straight clear Plexiglas tube. The third chamber is connected only to the surface, via a straight tube. The animals are allowed to pass freely between each chamber and the “surface” area, or between the two connected chambers, by these tubes. Food hoppers and water tubes are located in a far corner of the surface open area. All dividing walls and chambers are constructed of black Plexiglas. The roof of the chamber is made of clear Plexiglas to permit videotaping. The floor can be covered by a layer of sawdust bedding (1 cm) in all chambers as well as the surface for experimentation (not included).

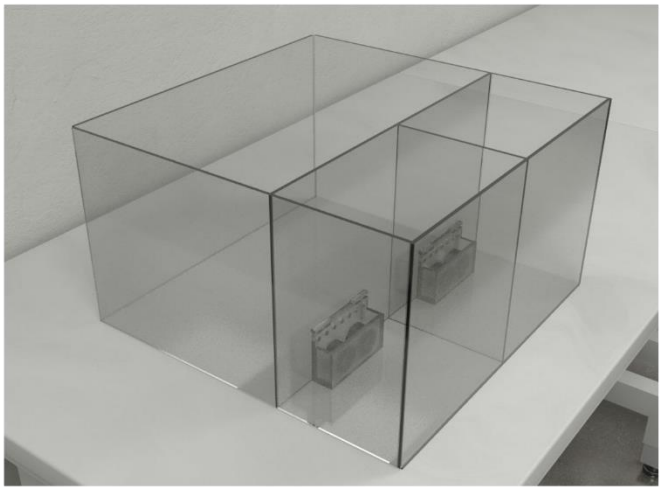
Sizing for mice and rats.

Suggested Color

Black

Available

Mouse **Rat**



Social Reward Chamber

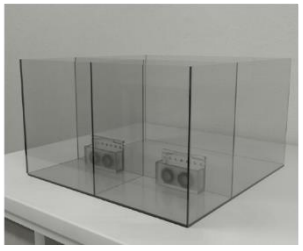
The social reward chamber utilizes social reward as a motivation for rodents in a binary choice model. Weights can be placed in the chamber doors to create a gradient of motivations for rodents.

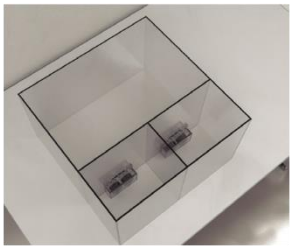
Suggested Color

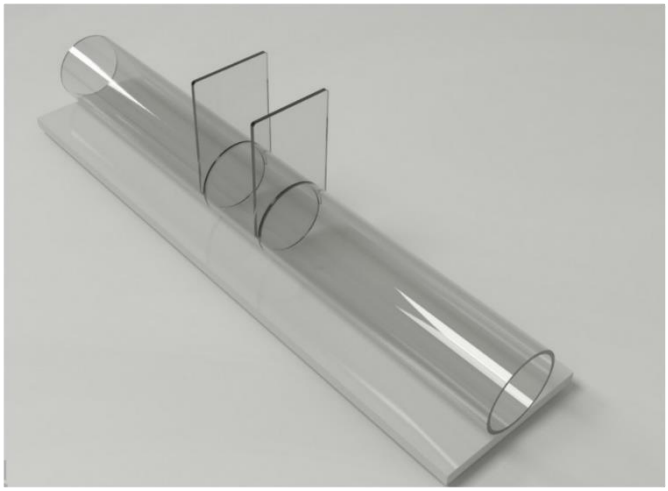
Black, Blue, White, Grey, Red, Clear

Available

Mouse **Rat**







Tube Dominance Test

The tube dominance apparatus allows for social hierarchy experiments demonstrated with winning in conflict situations. It has also been shown that these rodents just keep winning. Tube test winners have been observed to also win at other types of social behavior. In addition, social dominance is relative by nature. The same animal can act dominantly over a more subordinate opponent, but also act more submissively against a more dominant one. The Dalila effect is an excessive grooming behavior that have shown to be closely correlated with winning in the tube dominance test and is closely linked with many other social behaviors(Wang, Kessels, & Hu, 2014).
Our apparatus includes easy to use clear doors to allow start and stop of testing. Sizing available for mice and rats please inquire for custom sizing.

Suggested Color

Clear

Available

Mouse **Rat**

Resident Intruder

The Resident Intruder test is a chamber used for social defeat paradigms. Composed of a clear front of cage for video recording; opaque sides and back; wire top; lip on bottom to keep in bedding; easy to clean by spraying and wiping with 70% ethanol without losing clarity of front wall. A sliding panel door in front is used to introduce and retreive rats; it can also be used to separate them if need be. A slot to insert a wire mesh dividing wall between the two halves of the cage. A fixture to allow water bottle and food tubes

Suggested Color

Clear front, Grey sides

Features

•Easy Recording
•Mesh Roof

Available

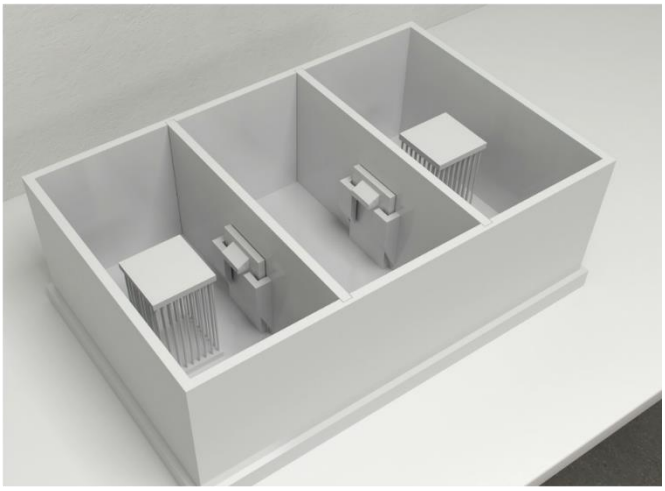
Mouse **Rat**

Social Defeat Apparatus

The social defeat test allows for study of recurrent defeat and is often used in SSRI's and other psychiatric compounds. The repetitive exposure encourages anhedonia, social avoidance behaviors, and anxiety and although relatively new (developed in 2006), is seen as a simple yet powerful model of social interaction. The MazeEngineers social defeat apparatus comes with two social defeat cages, an arena, and a clear divider for use in the home cage. Additional cages or modifications can be made upon request.

Available

Mouse **Rat**



Sociability Chamber

This 3 chambered device is a fantastic contraption for researchers studying socialization who require an apparatus in which variables may be altered to change the premises of the experiment. The design permits socialization but disallows aggravated socialization so that auspicious and accurate data may be collected. Measurable factors include transitions between chambers, time spent in direct contact, and unique behavioral variables such as jumping and grooming. Accoutrements for this product include floor cues, stainless-steel grids or perforated stainless-steel, to forge an aversive stimulus, and removable doors

to establish biased and unbiased conditioned place preference testing.

Suggested Color

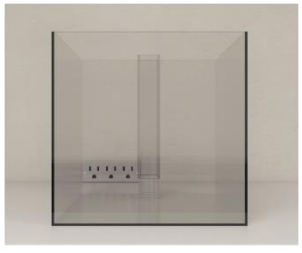
Clear with white base, Grey, Blue, Red, White, Black

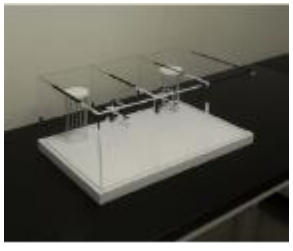
Modifications available

- Floor Insert
- Floor Insert (Carousel Cages)
- Extra Cage
- Box Square Carousel

Available

Mouse **Rat**





I Maze

The sentinel use of the I maze was to investigate the influence of habituation and drug treatments in both spontaneous and anxiety-related exploration behaviors in mice most similarly to the elevated + maze.

The apparatus consists of a starting closed alley facing either an open alley (open configuration) or another similar closed alley (closed configuration), modifiable. The starting and testing alleys were separated by a guillotine
door. Water spout comes with order.

Sizing for mouse, rat and custom available upon request

Suggested Color
White, Black, Grey, Blue

Available

Mouse **Rat**

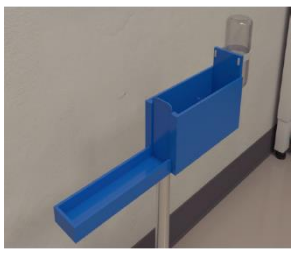
Circular Light-Dark Box

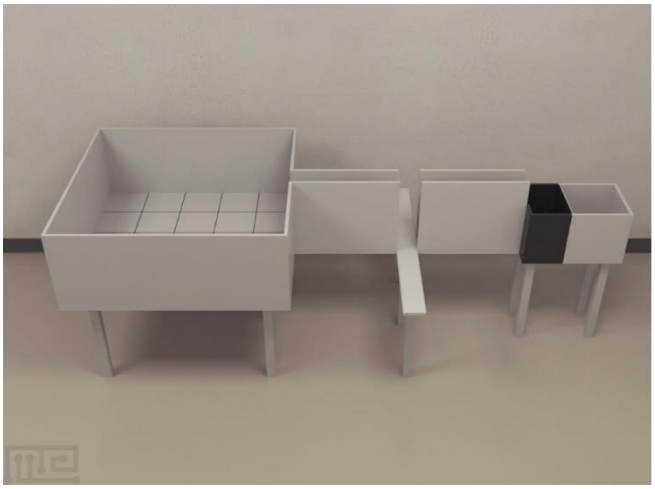
The Circular Light-Dark box (CLDB) consists of a circular alley with an inner and outer wall that is a variant of the light dark box. It is designed to assess the effects of anxiety and fear preferences between light and dark areas. Given a choice, rats prefer to stay in the unlit areas rather than the lit areas.

Suggested Color
Black and Clear

Available

Mouse **Rat**





Triple Test Maze

The Triple Test Maze is an integration of three well-known tests of anxiety/emotionality, namely the open field (OF), elevated plus maze (EPM) and light/dark box (LDB) originally described by Ramos et al. The apparatus is available from MazeEngineers for both mice and rats to fit the original specified protocol. Modifications available upon request.

Suggested Color

Grey with Black

Available

Mouse **Rat**

Hoarding Apparatus

Hoarding behavior has been described in many places in the literature, however this variant reviewed by Deacon (2012) is the standard offered by MazeEngineers. It consists of 8 rows with a removable clear lid, with an acrylic tube connected to 8 separate wire mesh tubes with a removable end. Sizing for mice and rats. Multiple colors available.

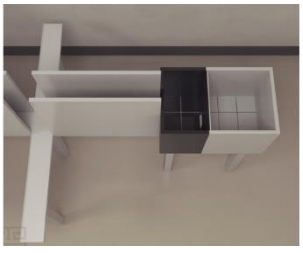
Hoarding apparatus is used to study a species-typical behavior manifested by transferring the food to secure place for later consumption. In nature, animals either hide food underground like squirrels and birds or near home base in burrows like rodents. Hoarding behavior is considered useful for animals in situations like extreme weather changes or when hiding from predators. Hoarding food rather than consuming and storing it as fat is thought to be more energy efficient because fat storage can increase body mass, decrease ambulation and increase chances of predation. Factors like spoilage or theft of food can affect the hoarding behavior.

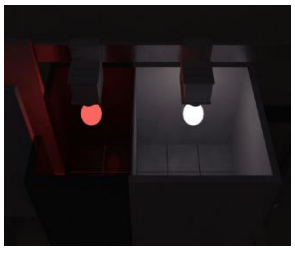
Suggested Color

Clear

Available

Mouse **Rat**





Ladder Rewarded Elevated Plus Maze

The Ladder variant of the Elevated Plus Maze was originally described by Bettis Et al (2009). In the ladder elevated plus maze, each arm comes with a wire mesh ladder that functions like a speed bump to increase the energetic cost to choosing an arm. A ladder is included on one arm to allow escape into an environmentally enriched area.

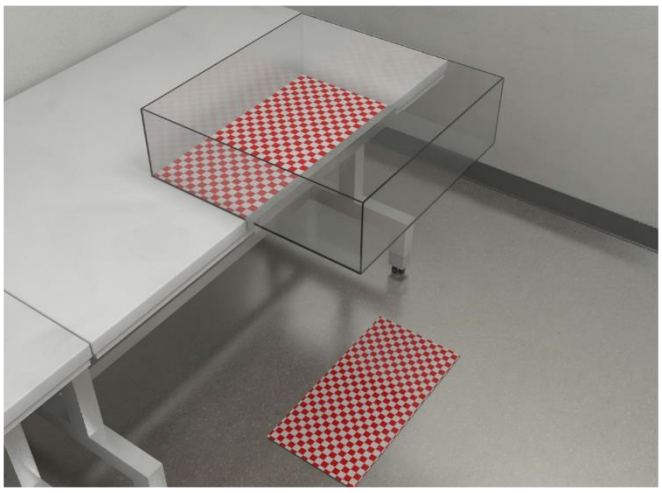
In the original protocols, a surrounding environment is included to encourage movement off of the elevated plus maze. This includes four plastic tunnels with different in color and textures (5 cm diameter × 14 cm length) and a round barrier of transparent acrylic (70 cm high, 122 cm diameter). Other environmental enrichments include artificial flowers, colored foam, a hula hoop, and hard plastic shapes. This is not included in the base price but can be ordered separately.

Suggested Color

Grey

Available

Mouse **Rat**



Visual Cliff Test

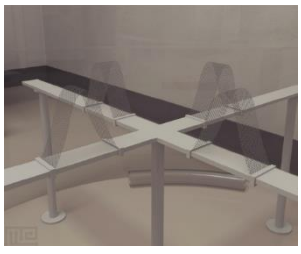
The visual cliff test is used for visualization of preceived barriers. Comes with chamber for visual cliff testing, sized for both mice and rats. Comes with one square pattern insert as well. Additional patterns available upon request.

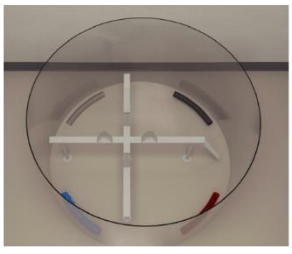
Suggested Color

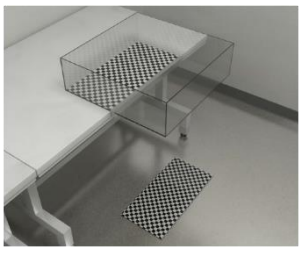
Clear

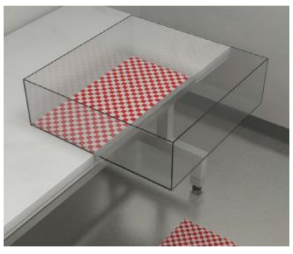
Available

Mouse **Rat**









Alley Maze

The alley maze was created in an experiment carried out by Battig et al. (1976) to assess exploratory behavior in rats.

Rats were exposed twice in a rotated sequence to a series of six mazes, consisting of hexagonal alleys, balanced for different alley length and structural complexity. Locomotor activity increased with alley length and decreased with structural complexity of the mazes.

Six alley configurations were obtained by intersectioning a complex hexagonal maze with barriers.

Mazeengineers offers the alley maze for both mice and rats. Custom coloring and customization are available upon request.

Suggested Color

Black

Available

Mouse **Rat**

Elevated Asymmetric Plus Maze

The Elevated Asymmetric Plus maze is an apparatus first described by Ruarte et al (1997) as a method to encourage explorative behavior in the rat.

The apparatus consists of an elevated asymmetric plus-maze composed of 4 different arms of the following specifications:
Arm 1: no walls

Arm 2: Single high wall

Arm 3: high and low walls

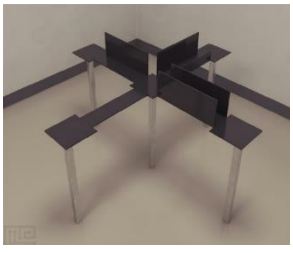
Arm 4: two high walls.

Suggested Color

Black

Available

Mouse **Rat**



3D Open Field

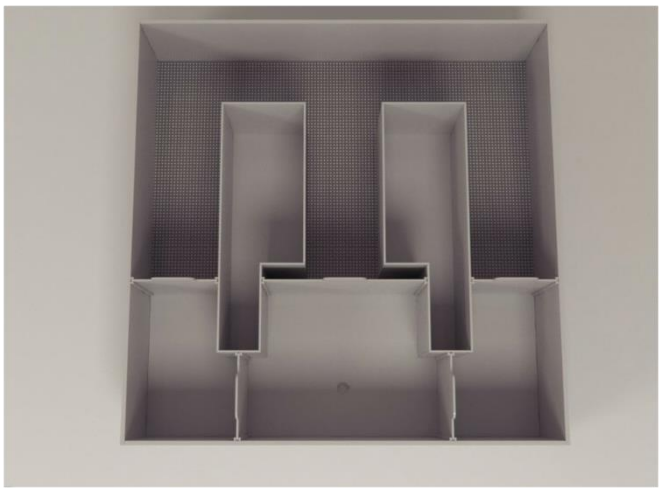
The 3D Open Field apparatus consists of an open, elevated platform with two opposite ends equipped with mesh slopes that are capable of being positioned at varying angles to create different combinations of the apparatus setup. The remaining sides are left open. When introduced to the apparatus, the rodent is presented with an anxiogenic environment that they are forced to explore while also trying to avoid and escape from.

Suggested Color

Black with Grey

Available

Mouse



Continuous Novel Object Recognition

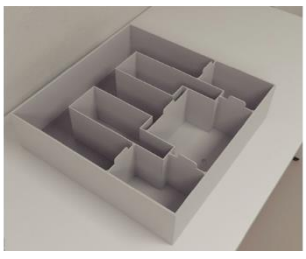
The Continuous NOR chamber was first described in the literature by Ameen-Ali et al (2012) as a way to improve on the classic NOR Delayed nonmatch to sample (DNMS) studies. The square shaped apparatus holds an E-shaped object area which is adapted for different contexts
During sample and test phases, objects are placed in the top left and top right-hand corners of the object area of the maze approximately 2 cm away from the wall.
There are four contexts in the chamber, all of which are included in the MazeEngineers apparatus.
Context 1: Grey surface
Context 2: Grey smooth surface + Polka dot pattern
Context 3: Black and white horizontal stripes with a wire surface
Context 4: Black and white vertical stripes with a wire surface

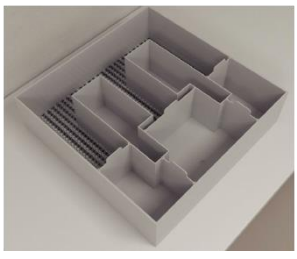
Suggested Color

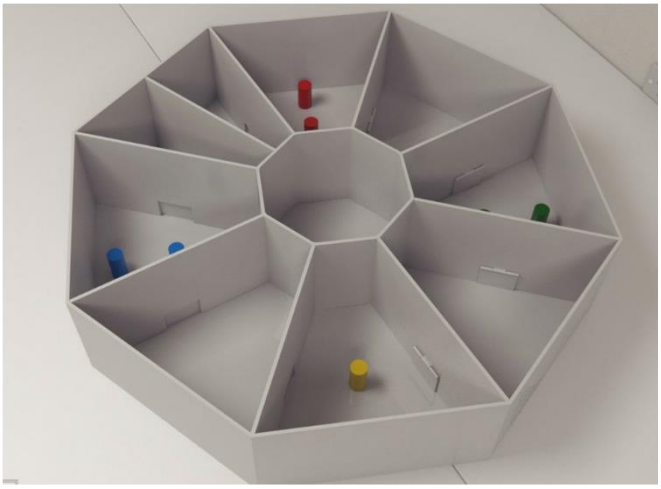
Grey

Available

Mouse **Rat**







Novel Object Recognition Asssay

The Novel Object Recognition assay gives a physical track for assessment of novel object memory.
The track is divided into nine compartments, including 7 equal compartments and two smaller compartments, which serve as the start and the stop compartments. Object pairs are placed in four of the seven compartments, with every second compartment being empty.
One way doors are included that allow rodents to move in a clockwise fashion only. Counter clock wise doors can be implemented upon request.
Object recognition standard holders are available on request

Suggested Color

Grey, Black, Blue, Red, Yellow, Clear, Dark grey

Available

Mouse **Rat**

MWM Open Field Tower

The MazeEngineers Straight Swim Channel assists in training mice and rats. No spatial discrimination is required when rodents use the channel as the channel is designed to only allow straight swimming to the designated target. The escape platform is usually placed in a raised position at the end of the alley.
Version 1: Full Length
Version 2: Half Length
100cm long, 15cm width, Height 26cm

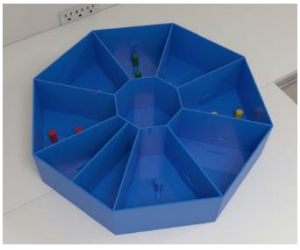
Suggested Color

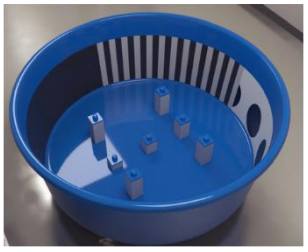
Blue

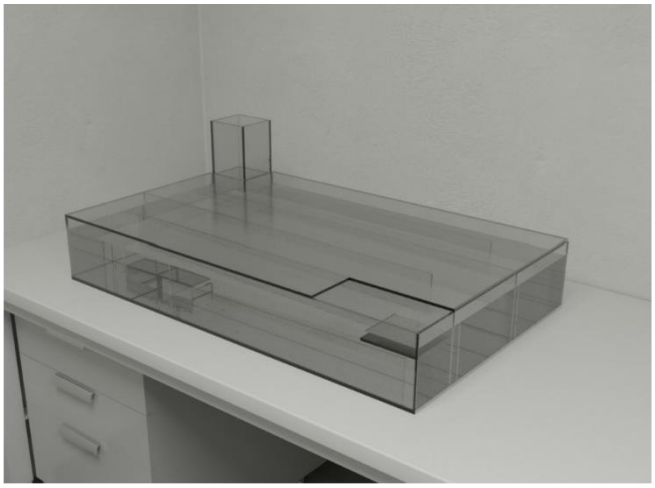
Available

4 FEET TUB **5 FEET TUB**

6 FEET TUB







Mammalian Diving Response Apparatus

The mammalian diving response is a highly conserved mechanism that supercedes most physiologic mechanisms, causing apnea, bradycardia, and vasoconstriction during oxygen deprivation in diving. It is a highly conserved response across vertebrates and seen in rats almost 100% of the time. MazeEngineers offers a diving tank to illicit the response for both mice and rats. Larger sizes can be requested for marmosets or other mammals.

Suggested Color

Clear

Available

Mouse **Rat**

mazeengineers.com/portfolio/mammalian-diving-response-apparatus

Double Y Angulated Maze

The Double Y Angulated Maze consist of two Y mazes joined at the end of each tail. It was used in a study to test whether the hippocampus is essential for vicarious trial-and-errors (VTEs) in a spatial memory task and in simple visual discrimination (VD) task by David Bett et al. (2012).

The Y-maze was constructed of acrylic and comprised a start box, two choice boxes, and four goal boxes, connected with alleyways. Each of the boxes was octagonal.

Rats were first started on a food deprivation schedule and handled for 5 min/day for 3 days prior to initial maze training. Then rats were trained to run from the start area on the maze and find the location of food rewards in one of the four goal boxes.

Mazeengineers offers the Double Y-maze for both mice and rats. Custom coloring and customization are available upon request.

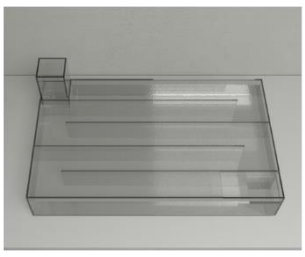
Suggested Color

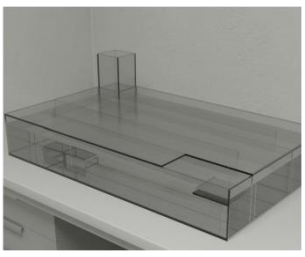
Black

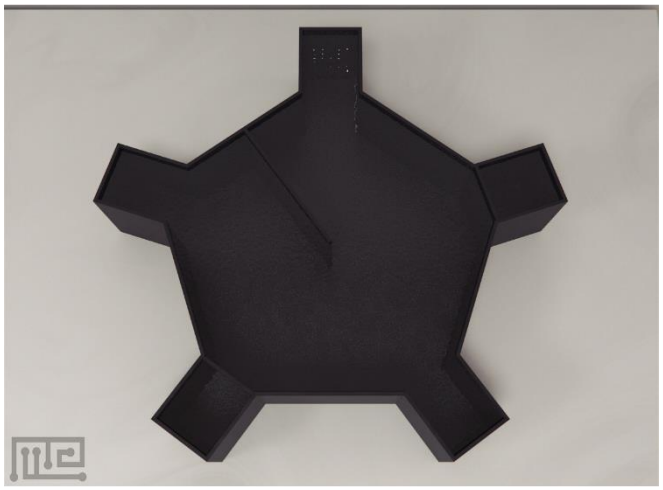
Available

Mouse **Rat**

mazeengineers.com/portfolio/double-y-angulated-maze







Forced 2-Choice Maze

The Forced 2-Choice Maze is used in a behavioral task to train rodents to overcome their natural aversion of light. It was used in an experiment by Benjamin M. Gaub et al. (2015), to test the functionality of rhodopsin for vision restoration in the rd1 mouse.

The Forced 2-Choice maze was modified from a Radial Arm maze by blocking two of the five arms of the maze and adding a divider to separate the two potential 'escape arms'.

One arm termed the illuminated arm, is lit by LED arrays; the other, called dark arm, remains unlit.

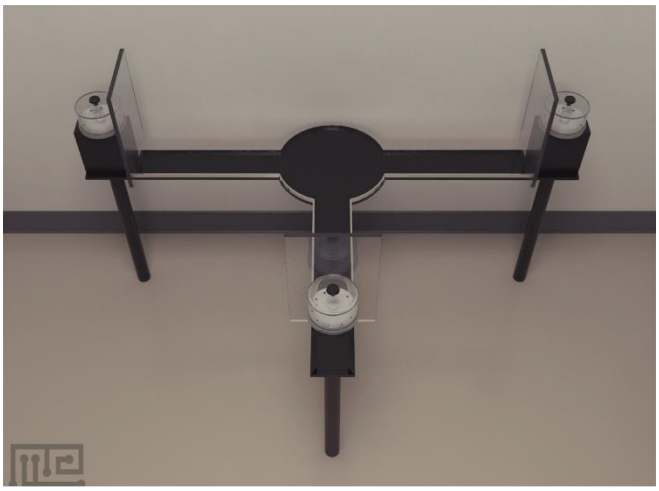
Mazeengineers offers the Forced 2-Choice Maze for both mice and rats. Custom coloring and customization are available upon request.

Suggested Color

Black

Available

Mouse **Rat**



Circular Central Platform T Maze

The circular central platform T Maze offered by MazeEngineers is used in experiments to investigate spatial navigation in rodents.

The apparatus is a T-shaped acrylic maze elevated above the floor. It consists of a circular central platform and three arms bounded by high stainless-steel lips.

A remote-controlled food dispenser is attached to the end of each arm can be added to match the baseline specifications of the seminal paper.

To prevent the rat from interfering with the food dispensers, a transparent Perspex barrier is set vertically between the end of each arm and the corresponding dispenser. A small hole at the base of each barrier allows food pellets to be ejected onto the arm.

Maze Engineers offer the circular central platform T Maze for both mice and rats. Custom coloring and customization are available upon request.

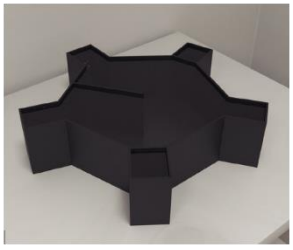
Suggested Color

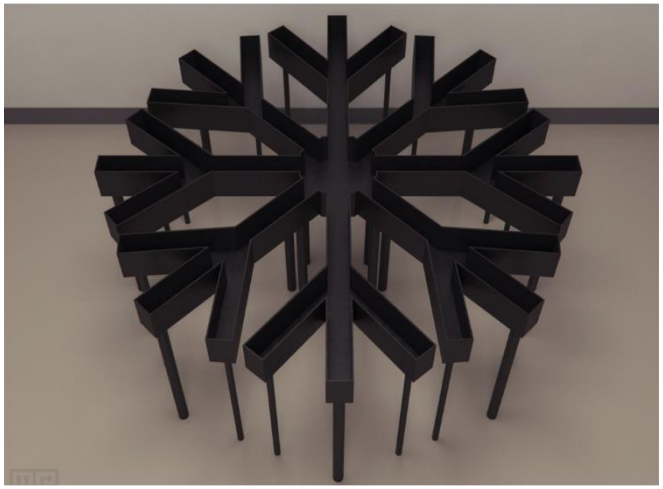
Black

Available

Mouse **Rat**

Mouse Automated **Rat** Automated





Hierarchal Maze

The hierarchical maze was built as a result of an experiment carried out by Olton et al.(1979), to assess spatial memory in rats.

The maze consists of a center platform with eight primary arms and three branching secondary arms at the end of each primary arm.

In the experimental procedure, by placing food at the end of each secondary arm, 24 different spatial positions were created in which rewards could be collected. Rats very rapidly came to collect all eight rewards with a very low level of repeating entrance into the same arm.

Mazeengineers offers the hierarchal maze for both mice and rats. Custom coloring and customization available upon request.

Suggested Color

Black

Available

Mouse **Rat**

Gap Cross Test

A notable utilization of the Gap test is by Learoyd and Lifschitz is in rats, where they use their whiskers to judge whether the distance of an elevated gap is crossable, as they are exposed to gaps of increasing distances. The gap crossing test has been used to determine the chronic effects of whisker removal during development and the effect of cerebral peduncle lesions as well as traumatic brain injury.

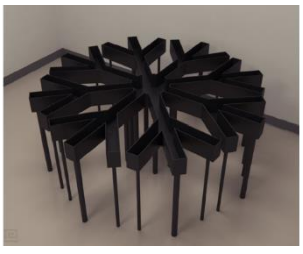
In the gap crossing test offered by MazeEngineers, half the box and the other is black, which serves as a darkened goal box. The floor of the goal box slides out to create a gap. Sizing for mice and rats available.

Suggested Color

Black with Grey

Available

Mouse **Rat**



Double Bandit T Maze

The Modified Double Bandit T-Maze is used to evaluate the decision-making behavior of rodents. The maze is an adaptation of the conventional T-Maze often used in the assessment of spatial learning. The Modified T-Maze allows observation of the role of award induced spatial learning, experience-based cognitive behavior and foraging techniques as well as two arm bandit tasks. Further, it provides the opportunity to understand and investigate the role of the different parts of the brain and their associated probable function in relation to value-based decision making.

Suggested Color
Black

Available

Mouse **Rat**

Fictive Reward

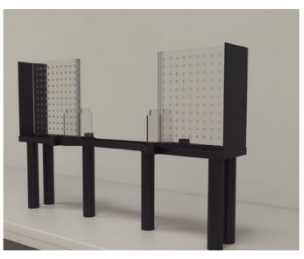
Fictive Reward Maze is a learning task that involves studying and observing surroundings and making adaptive future choices accordingly. It tests learning capability of the subject to analyze and compare reward and punishment without actually experiencing them.

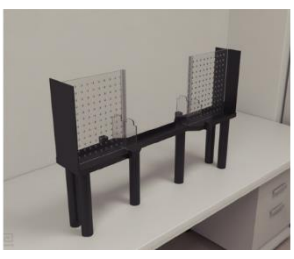
The maze is linear, elevated and consists of two start boxes and goals respectively. At the start of the test session, the subject is placed in the start box, and auditory sounds are ringed. The number of sounds reflects the magnitude of the reward. The subject leaves the start box and arrives at the chosen target to receive the actual reward. The fictive reward is served in the unchosen goal that is visible through the transparent wall.

Suggested Color
Black

Available

Mouse **Rat**





Angle Entrance Task

The Angle Entrance Task was devised for a diffuse brain injury rat model. The original sentinel paper for discovery did not find ability for sensitivity in detection of injury induced sensory deficits. However, MazeEngineers still offers this device for potential replication and utilization in other models. The device functions with an adjustable angle that moves away from the box at 30°, 40°, 50° or 80° corners. The interrogates how far the rat moves into the corner given these angles.

Suggested Color

Black

Available

Mouse **Rat**

Six Alley Maze

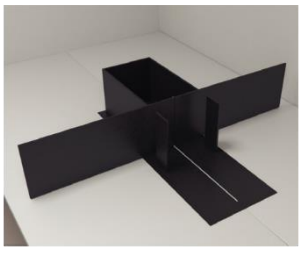
The Six Alley Task requires that the animal remember and select a correct arm out of a set of geometrically similar, although visually distinct arms. Correct performance in the task is therefore indicative of the animal's ability to distinguish between the six alleys. Sizing for mouse, rat and custom available upon request.

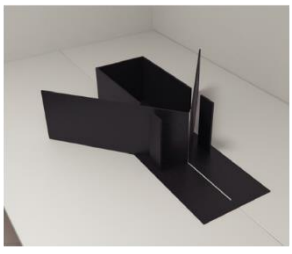
Suggested Color

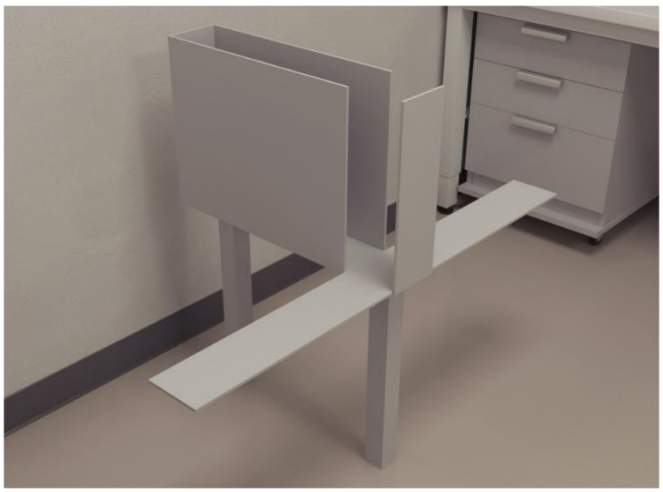
Grey and Black

Available

Mouse **Rat**







Elevated T Maze

Graeff, Viana, and Tomaz (1993) developed the Elevated T-Maze to probe deeper into anxiety disorders. Conditioned fear is associated with generalized anxiety disorder (GAD), and unconditioned fear is linked to panic disorder (PD). The Elevated T-Maze relies on the subjects' innate fear of heights and open spaces. Anxiety in rodents can be analyzed by evaluating inhibitory avoidance in the face of conflicts whereas panic can be analyzed using one-way escape tests on the Elevated T-Maze. If there are a similar increase and decrease in the tendency to avoid or escape in the elevated T-Maze, then locomotor tests need to be conducted independently to draw any robust conclusions.

MazeEngineers offers sizing appropriate for mice and rats.

Suggested Color

Grey

Available

Mouse **Rat**

E Maze

The E- Maze is used to assess episodic memory in rodents. Episodic memory refers to recollecting an event consciously. It involves recalling what happened, where it happened and when it happened. For the most accurate recollection of episodic memory, language is an absolute necessity, precisely why analyzing episodic memory in the lab is an extremely tough ordeal.

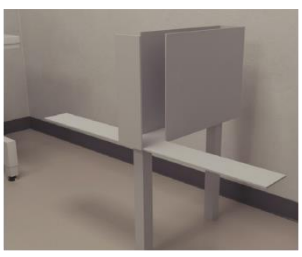
The E maze is available with both clear and black inserts for replication of the sentinal paper or in multiple colors for variant use. Sizing in mouse, rat and custom sizing available upon request.

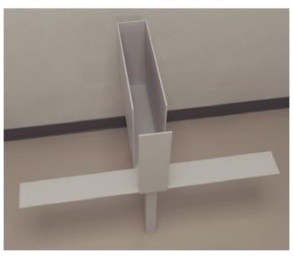
Suggested Color

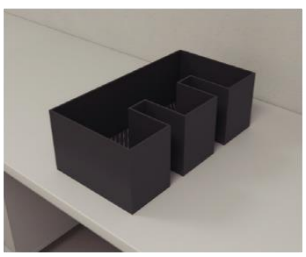
Black

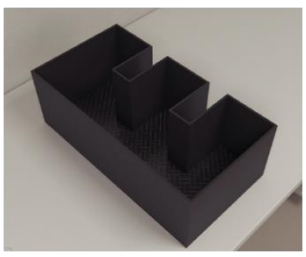
Available

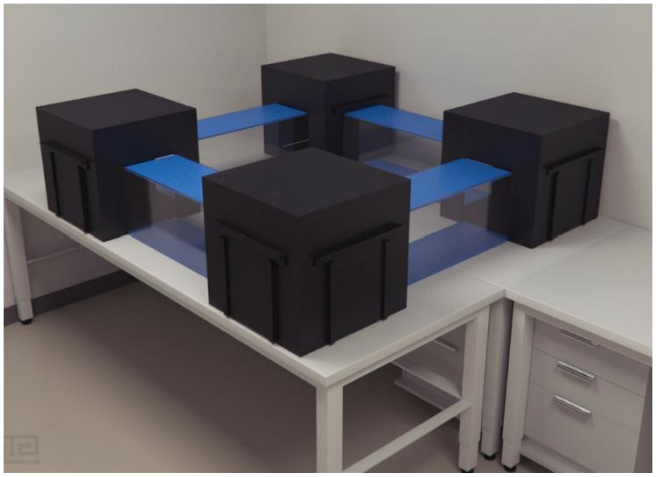
Mouse **Rat**











Four Box Maze

The sentinel use of the four box task was for a baseline task in which rats were trained in a square box environment. A subsequent probe trial was done in which the original training route was blocked and three novel routes were introduced, one of which led directly to the food reward. The original paper showed that rats failed to choose this shortcut route over the alternative routes, implying that novel spatial inference was missing in rodents whereas it may be present in humans and infants.

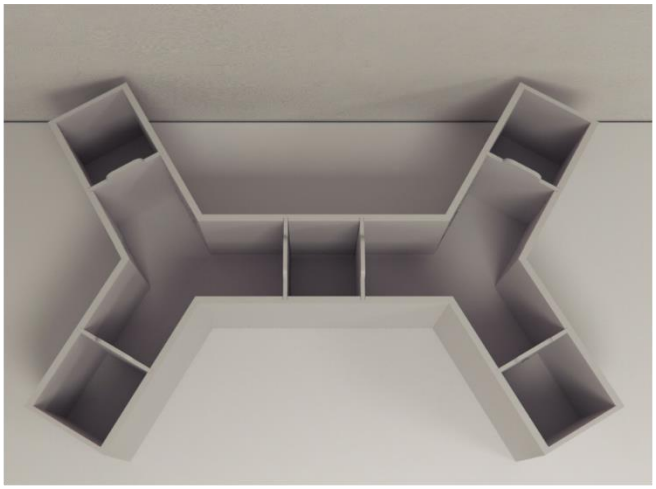
Sizing for mouse, rat and custom available upon request.

Suggested Color

Black and Blue

Available

Mouse **Rat**



Double Y Maze

The double Y-maze was developed as a measure of mnemonic function (Mallet and Beninger, 1993). The double Y-maze presents the mouse or rat with two consecutive tasks on each trial: a spatial discrimination task in the first 'Y', followed by a delayed alternation task in the second 'Y'. In trained rodents, the first task is a test of reference (trial independent) memory, while the second task is a test of reference and working memory (trial dependent) memory. The tasks make identical demands on the rodent in all ways (eg motivation, locomotion, sensory perception), except for the addition of the working memory component of the second task.

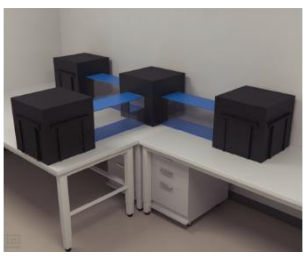
Thus, if a trained rodent performs as expected in the first task of the maze (involving reference memory only), then poorly in the second task (involving reference and working memory), the difference can confidently be attributed to a failure in working memory.

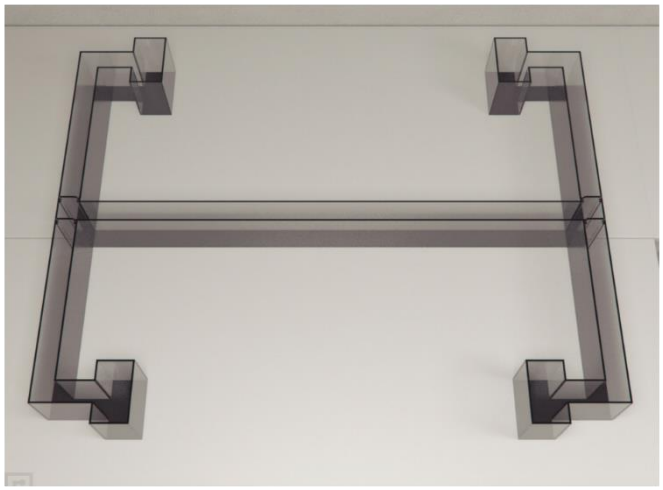
Suggested Color

Grey

Available

Mouse **Rat**





H Maze

The H Maze is a track consisting of two T-mazes placed end-to-end to form an ‘H’ shape. Each end of an H has a reward chamber. The initial use in the literature of the H maze was in the study of hippocampal theta rhythms as a spatial navigation task. 4 guillotine doors are included in the order. Sizing available for mice and rats. Multiple colors and variants available.

Suggested Color

Clear

Available

Mouse **Rat**

Double H Maze

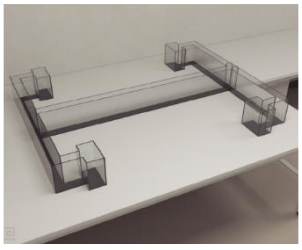
The original utilization of the Town maze was to study hippocampal place cells. Rather than a simple environment, the town maze provides a more urban like environment with two start locations, three alternate paths in the maze midsection, followed by a two-way choice that determines the trial outcome, which is access to a food reward. The MazeEngineers version of the Town Maze is sized for both mice and rats and can be ordered in a variety of colors.

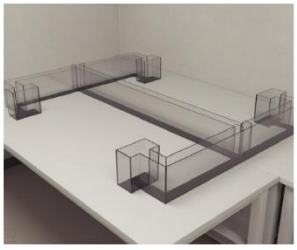
Suggested Color

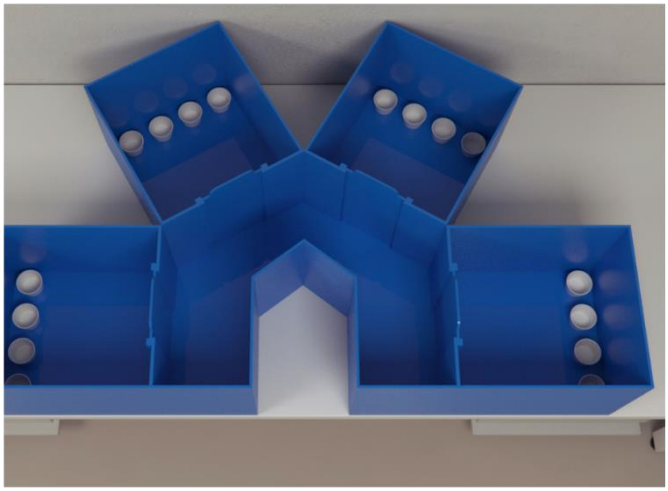
Clear

Available

Mouse **Rat**







W Maze

The four-compartment environment is made from acrylic and consists of four rectangular boxes.

Two different apparatuses are available through MazeEngineers:

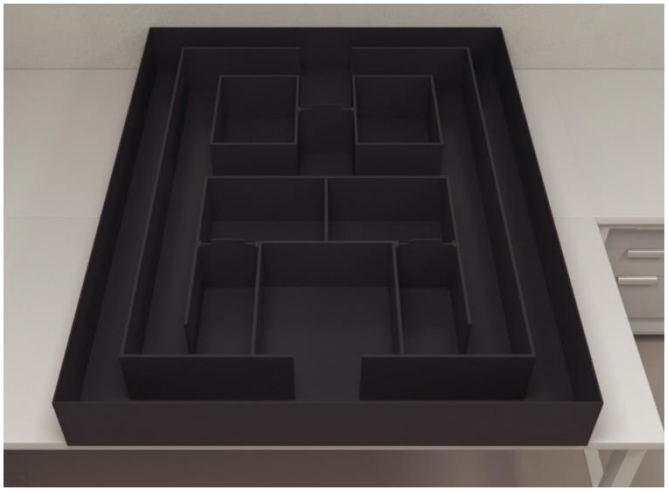
- W Maze: 60° separation between compartments
- Straight W Maze: Parallel configuration of the compartments
- Odor boxes of Basil, Coriander, Cumin, and Rosemary is optional

Suggested Color

Blue

Available

Mouse **Rat**



Town Maze

The original utilization of the Town maze was to study hippocampal place cells. Rather than a simple environment, the town maze provides a more urban like environment with two start locations, three alternate paths in the maze midsection, followed by a two-way choice that determines the trial outcome, which is access to a food reward. The MazeEngineers version of the Town Maze is sized for both mice and rats and can be ordered in a variety of colors.

Suggested Color

Black

Available

Mouse **Rat**

Crossword Maze

Crossword Maze is a learning paradigm to study the process of memory stabilization and reactivation. First discussed in the literature by Colin, Alvaro, Stephanie, Natalia, and David (2014), this maze consists of boxes and intersections to allow allocentric spatial learning in rodents.

Sizing for both mice and rats available. This maze is useful for applications of spatial learning of new goal locations and is ideal for photo stimulation environments, as first used in the literature (McNamara et al, 2014).

Suggested Color

Black

Available

Mouse **Rat**

Object Space Task

This maze was first described in the literature by Sato et al (2017) for learning and memory. The device comes with five vertical and five horizontal corridors that allows for a flexible construction of routes. Similar to the Hebb Williams maze, successively more difficult modular tests are performed on the rodent to create environments that challenge spatial learning memory. The device from MazeEngineers is available for both mice and rats.

Suggested Color

Black

Available

Mouse **Rat**

Dry Morris Water Maze

The Dry Morris Water Maze is a dry land version of the Morris Water Maze (MWM). The task is used in the assessment of spatial learning and memory. Much like the Morris Water Maze, the Dry Morris Water Maze is a hidden-goal task that requires the food-deprived subjects to locate the hidden food rewards. This food motivated task is less stress-inducing than the conventional MWM which uses the fear of drowning to motivate the subject to find the hidden platform. This task requires the use of hippocampal-based learning to remember and locate the hidden rewards. This ability can be affected by lesions and drugs.

The Dry MWM is a food reward-based task. Subjects are placed in an open field that is covered with sawdust and are required to find the hidden food reward. The task can be aided by distal cues placed around the maze. Another dry adaptation of the Morris Water Maze is the Oasis Maze. Instead of a sand bed to hide the reward, as is the case with the food reward dry maze, the Oasis Maze has small hidden wells, scattered around the arena, holding water. Both these tasks use the same principle of spatial learning and memory. Other similar mazes include the Morris Water Maze and Barnes Maze.

Suggested Color

Grey

Available

4 FEET TUB **5 FEET TUB**

Lattice Maze

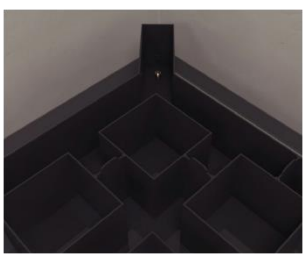
This maze was first described in the literature by Sato et al (2017) for learning and memory. The device comes with five vertical and five horizontal corridors that allows for a flexible construction of routes. Similar to the Hebb Williams maze, successively more difficult modular tests are performed on the rodent to create environments that challenge spatial learning memory. The device from MazeEngineers is available for both mice and rats.

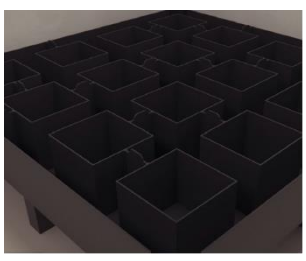
Suggested Color

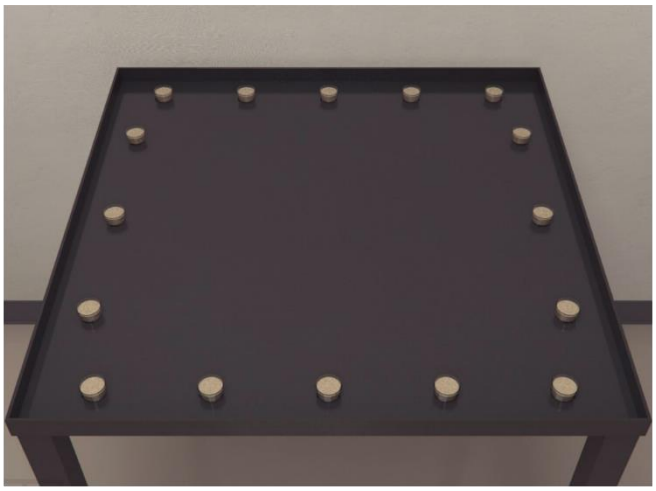
Black

Available

Mouse **Rat**







Odor Span Test

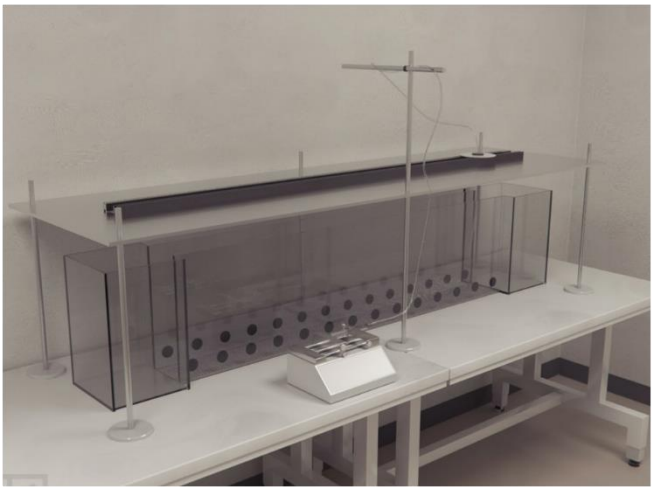
The odor span apparatus tests the contribution of the hippocampus to normal memory capacity in rodents using location span tasks. In the odor span task, rodents are assessed in their ability to remember increasing numbers of odors. It is a widely used test to detect subtle changes in olfactory working memory can study subtle effects of genetic induction or drug effects in rodents.

Suggested Color

Black

Available

Mouse **Rat**



Magnetic Self Administration Runway

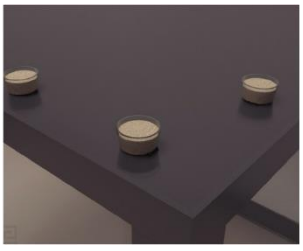
The magnetic self administration runway apparatus consists of parallel magnetic rails, set a few centimeters apart from each other, positioned directly above the center of a runway. A swivel carriage device rests freely between the rails with one of its end connected to the PE tubing to the subject and the other end connected to the syringe pump. The swivel assembly moves between the rails as the subject traverses the alley eliminating the need to disturb the sessions for drug administration. The apparatus can be fully automated upon request to provide location data about the subject.

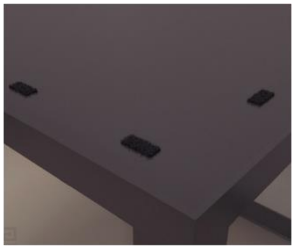
Suggested Color

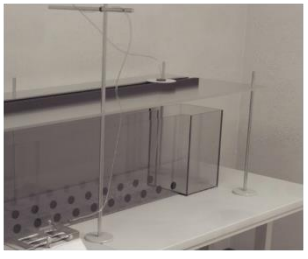
Clear

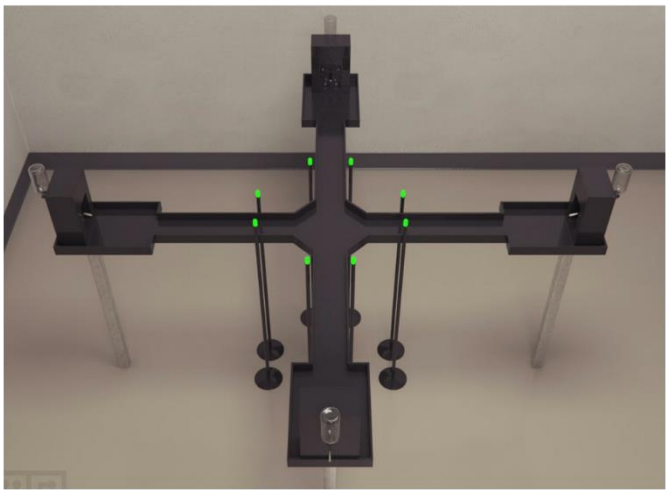
Available

Mouse **Rat**









Win Stay Maze

The Win Stay maze is based on in-shift task as done by Berke et al with rats, whereby the dorsal hippocampus and striatal cells are measured during the task with overwhelming activation of the hippocampal place cells. The dorsal/lateral striatum are more important for learning and choosing actions in body-centered (egocentric) coordinates, such as a left-turn response (Brasted et al. 1997; Cook and Kesner 1988), whereas the hippocampus is more important for remembering particular spatial locations defined by arrays of external cues (allocentric coordinates;Morris et al. 1982).

When a behavioral task forces an animal to make use of one form of information over the other, inactivation of striatum increases use of a hippocampal-dependent “place” strategy, whereas inactivation of hippocampus increases use of a striatum-dependent egocentric “response” strategy. Thus, they are in contrast to each other.

This maze utilizes this anatomy specifically for the win shift task.

-Maze: Acrylic plus maze, matte black, elevated 71 cm from the floor. Central octagon (25.5-cm diameter), four arms (46 × 9.5 cm), and four goal boxes at the end of the arms (30 × 15 cm). 3cm guard rails.

-Cue lights (NOT) included in the order: Green LEDs on stalks, located 12 cm into each arm) indicated the rewarded arm on each trial

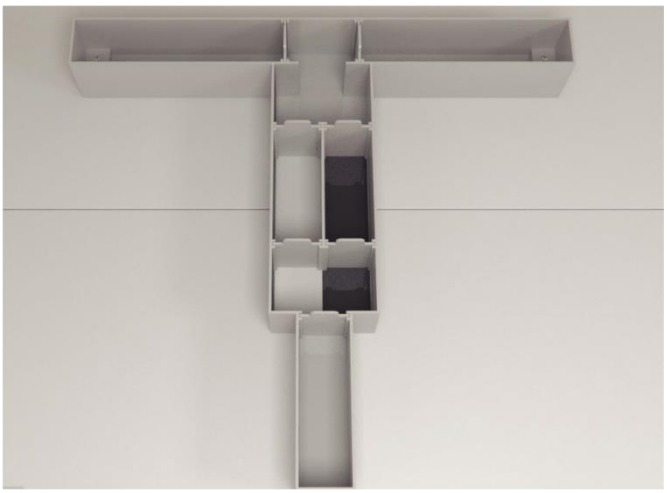
-Liquid dispensers (4) are included in the order.

Suggested Color

Black

Available

Mouse



Two Problem T Maze

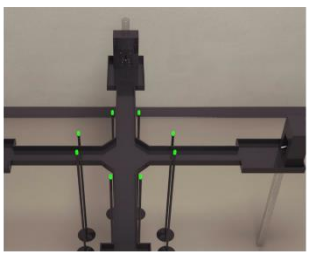
The Two problem T maze was originally described in the literature by Thomas and Gash (1988) and used by Granon et al (1994) in working memory investigations. Both Matching to Sample (MTS) and Non Matching to Sample Procedures (NMTS) are used in the trial. MazeEngineers offers sizing appropriate for mice and rats.

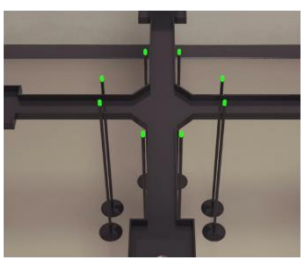
Suggested Color

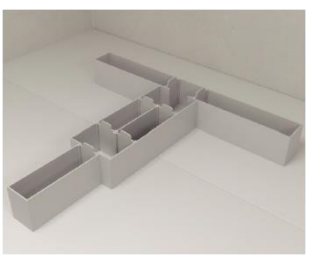
Grey

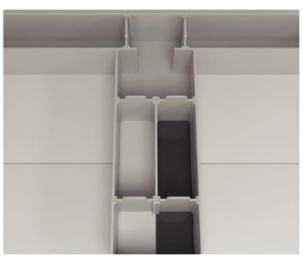
Available

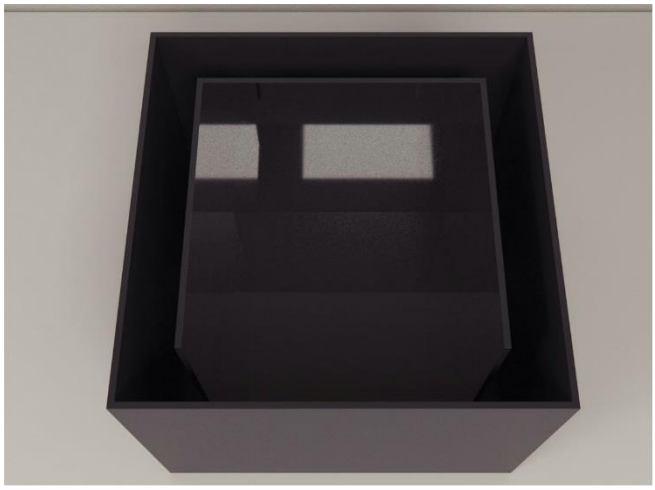
Mouse **Rat**











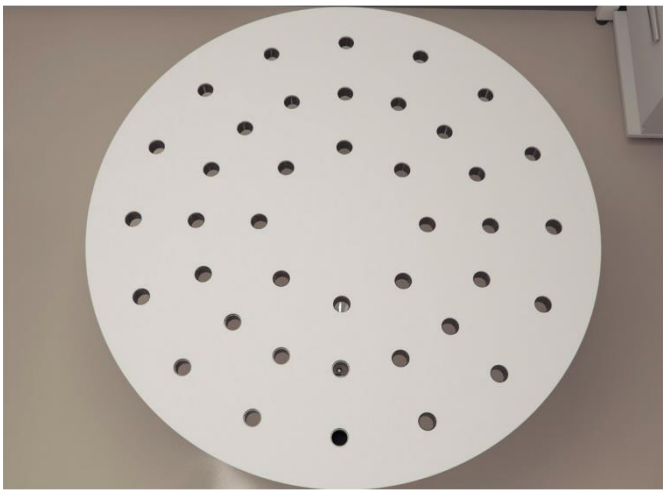
Mirror Chamber Version 2

The mirror chamber for rodents was originally described in the literature for evaluation of anxiety. This variant was published in 2010. This mirror chamber apparatus consists of two open-top boxes constructed of black Acrylic. The larger box contained one wall lined with a mirror and four walls which are black. The inner surfaces of the five panels of the smaller box are lined with mirror panels and come together for an open mirrored area.

Suggested Color
Black

Available

Mouse **Rat**



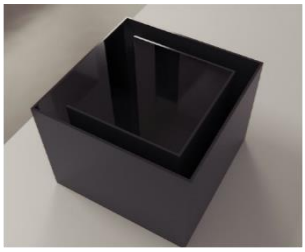
Delayed Matching To Place (DMP) Barnes Maze

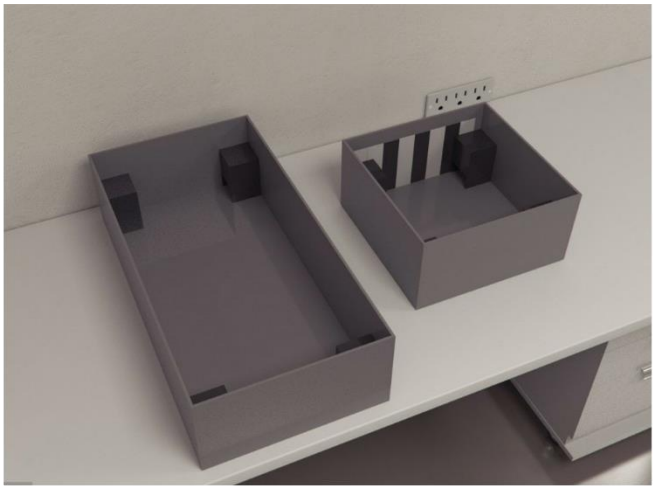
This modification of the Barnes maze was originally described in the literature as a delayed-matching-to-place (DMP) dry maze test is a variant of DMP water maze by Steele and Morris (Steele and Morris 1999) and refined by Faizi et al (2012).
The DMP protocol uses a well patterned Barnes Maze with 16 holes on the outer ring, 16 on the middle ring and 8 holes on the inner ring with distance of 50, 35 and 20 cm to the center of platform, respectively.
ABS tubes (Inner diameter = 52 mm, outer diameter = 60 mm) are attached to each escape hole which allows easy attach and detach of the escape tube.

Suggested Color
White

Available

Mouse **Rat**





Spatial Reorientation

The Spatial Reorientation task was originally described in the literature in rodents by Lee et al (2015). The apparatus allows for tests of cue specificity and task specificity in spatial reorientation in mice using two types of environmental cues: 1) boundaries and 2) features (stripes), in two types of tasks: A) working memory and B) reference memory.
The MazeEngineers apparatus comes with two chambers.
Chamber 1: A uniformly colored gray rectangular arena
Chamber 2: A square arena with three gray walls and one striped black/white, featurally distinctive wall
The arena is filled by the experimenter with 5 mm of water.
In each corner is a black box with opening (7.5 7.5 4 cm) on one side. To minimize the availability of any potential visual cues, the opening is always on the side of the box that faced away from the center of the arena.

Suggested Color

Dark grey

Available

Mouse **Rat**

Escape Hole Radial Arm Maze

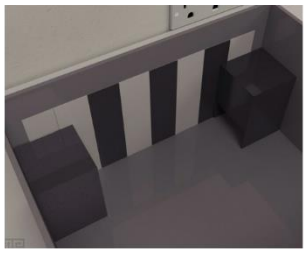
This modification of the radial arm maze combines the best elements of the Radial arm maze with the fear aversion motivation of the Barnes maze. Originally described by Paganelli et al (2004) in a murine model of cerebral ischemia, the device is a sensitive and well-designed apparatus for evaluation of learning and memory.
All 8 arms have holes in which rodents can seek escape, but of the 8 arms, only one contains true refuge; the remaining arms have goal boxes that are open-ended. Rails (2.5 cm high) borders each arm to prevent the animal from falling. The rotatable maze was elevated 90 cm above the floor on a metal stand, similar to the Barnes maze to shift extramaze cues.

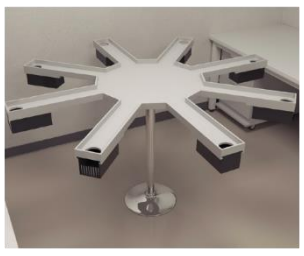
Suggested Color

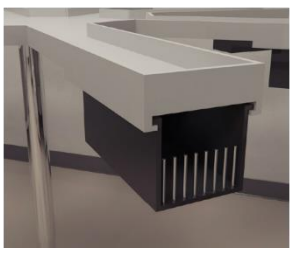
White

Available

Mouse **Rat**







Controlled Y Maze

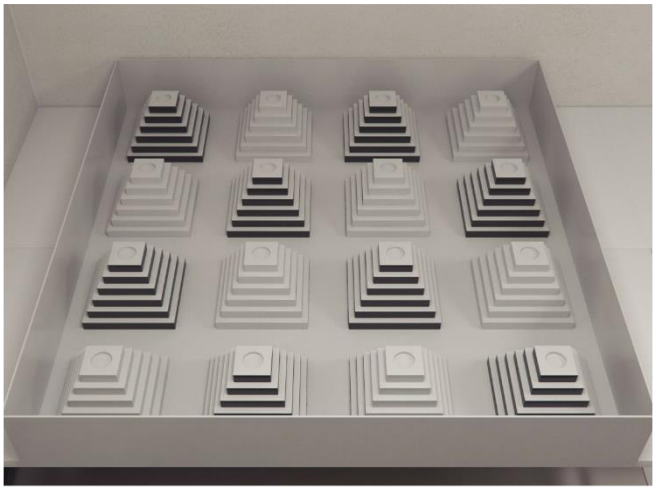
This Y-maze apparatus variant is smaller (about half the size) of the traditional y maze and comes with a single door. As a more cost effective apparatus, it can be used for spontaneous alternation as well.
This task was described in the literature by Pagnussat et al as a way to assess short-term spatial memory, which is based on the innate preference of animals to explore areas that have not been previously explored.
This task consisted of two trials (training and test) of 8 min each separated by an intertrial interval of 120 min. During the training trial, one arm (novel) was blocked by a removable door and mice were placed at the end of the one arm (start) facing the center. Mice could choose between the start and the third open arm.
They were then later run on a test trial, where the novel arm was opened and the animals were once again placed at the start arm and allowed to explore freely the three arms for 8 min.
The number of entries and the time spent in each arm were recorded. Entry into an arm was defined as placement of all four paws into the arm.

Suggested Color

Light grey, Dark grey, Clear, Black, Red, Blue

Available

Mouse **Rat**



Ziggurat Task

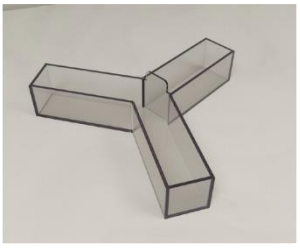
The Ziggurat task (ZT) was originally described in the literature by Faraji et al as a 10-trial spatial learning protocol over the course of 4 days in cerebral ischemia. It can be baited with dried spaghetti in order to encourage rewarded learning.
The MazeEngineers apparatus version comes with both White and Black Ziggurat sets and an open field chamber. Individual Ziggurats can be customized and ordered upon request.

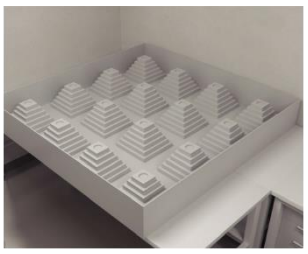
Suggested Color

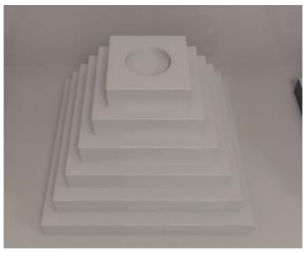
White

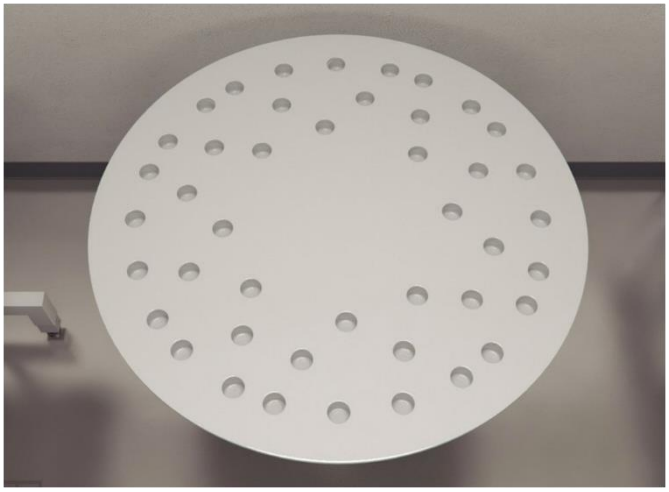
Available

Mouse **Rat**









Randomized Barnes

This modification of the Barnes maze was originally described in the literature as a method to increase the task difficulty of the classic Barnes Maze Task. This theoretically leads to a decrease in the serial strategy of goal hole choice.
The increase in the number of holes does not result in poorer performance, but the random arrangement does. (O'leary & Brown, 2012)

Suggested Color
White

Available

Mouse **Rat**

Mirror Chamber Test

The mirror chamber for rodents was originally described in the literature for evaluation of anxiety. The use of mirrors is an interesting addition to the MazeEngineers repertoire and novel research can be done in fields of learning, spatial orientation, and exploration. This chamber, however, is classically described for anxiety.

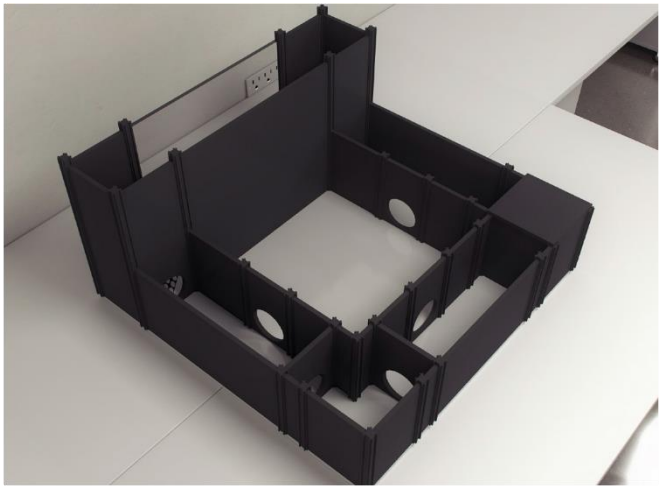
MazeEngineers offers Two versions
Version 1: one described in the literature, one by Kliethermes (2003) originally described in the literature for anxiety in Mice.

Version 2: The second described by Paterson et al (2010), two boxes, one exterior black acrylic box, a second box with three interior mirror walls.

Suggested Color
White

Available

Mouse **Rat**



Multivariate Concentric Square Field Test

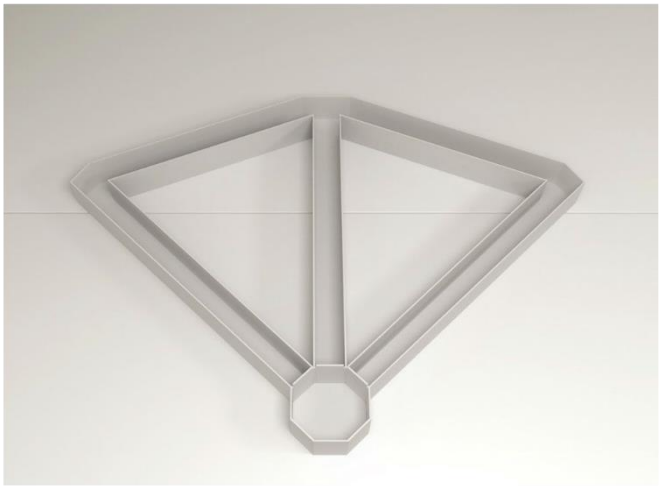
The MCSF was originally described in the literature by Meyerson et al., 2006, for rats and later adopted by Ekmark-Lewen for mice. The behavioral model provides several areas for the animal to explore by free choice, including sheltered, open, and elevated areas. It also includes a holeboard device; and areas with differential lighting. It includes an open field (72 x 72 cm) surrounded by an outer wall (28 cm high), with a smaller square field (CENTER, 42 x 42 cm) located in the center of the box.
The device can be automated with IR detection in order to detect location, or can be done manually. If automated two cells are located in the arena in the arena, one between the SLOPE and BRIDGE areas, detects BRIDGE entrance. The second photocell device was located under the holeboard floor of the HURDLE, which gives recording of head dips.

Suggested Color

Black

Available

Mouse **Rat**



Continuous Angled T Maze

The Angled T Maze has been described in the literature for Grid cell experiments. It is a useful modification for continuity between the start and a second trial. The MazeEngineers Angled T Maze comes with three manual doors for your experiment.

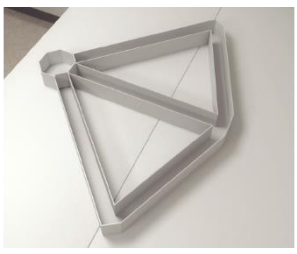
Suggested Color

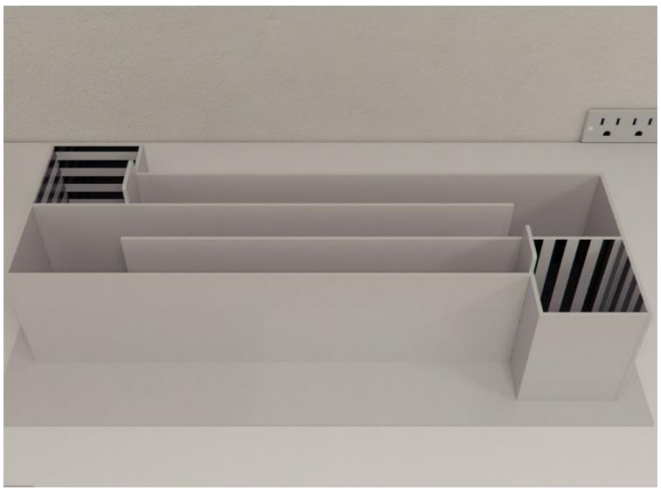
Black, Blue, White, Grey, Red, Clear

Available

Mouse **Rat**

Large Rodent





Self Administration Runway

The rodent self administration runway is a simple yet elegant device described in the literature for drug self administration in a goal box. Drugs, alcohol and other substances can be placed at the goal box. The MazeEngineers apparatus has different sizes for both mice and rats, comes in multiple colors for a start box/end box and three runways with small barriers in the floor.

Suggested Color

Black, Blue, White, Grey, Red, Clear

Available

Mouse **Rat**

Morris Water Straight Swim Channel

The MazeEngineers Straight Swim Channel assists in training mice and rats. No spatial discrimination is required when rodents use the channel as the channel is designed to only allow straight swimming to the designated target. The escape platform is usually placed in a raised position at the end of the alley.
Version 1: Full Length
Version 2: Half Length
100cm long, 15cm width, Height 26cm
Full height options are also available. Please inquire for more details.

Suggested Color

White, Clear, Black, Blue, Dark grey

Available

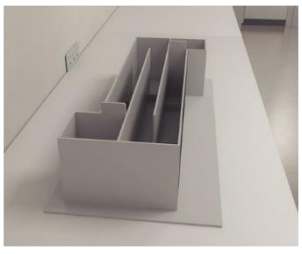
Full Length Channel

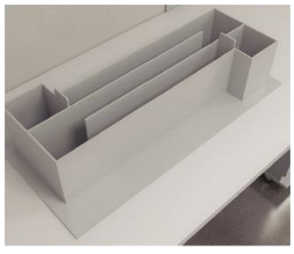
4 FEET TUB **5 FEET TUB**

6 FEET TUB

Half Length Channel

4 FEET TUB **5 FEET TUB**





Morris Water Snowcone

The MazeEngineers Snowcone Morris Water Maze modification utilizes the MWM as a base. It comes with two stainless steel inserts to fit the Morris Water Maze of your choice.
Typically, the tub can be filled with 0.3m (11 inches) of water. These accessory inserts create a snow cone shape in the Morris Water Maze. This square corner formed by the inserts acts as a geometric cue
A square (10 x 10 cm) black Pexiglas platform is provided. It is typically placed 25 cm from the pool edge.
Researchers often place an opaque coloured balloon measuring roughly 20 cm
in diameter was hung 15 cm above the platform. This is not included.

Suggested Color

Blue

Available

4 FEET TUB **5 FEET TUB**

6 FEET TUB

Hairpin Maze

The Hairpin maze is a unique maze has been described in the literature for studying grid place cells. Mouse and rats run through interconnected compartments of equal shape and orientation in 10 equal length alleyways.
A removable version is available allowing conversion into an open field box as well as insertion of truncated arms.

Suggested Color

Black, Blue, White, Grey, Red,Clear

Available

Static Model

Mouse **Rat**

Removable Model

Mouse **Rat**

Morris Water Radial Tread

The MazeEngineers Radial Water Tread Maze modification utilizes the MWM as a base.
Our modification of this maze comes with nine exits, each 1.5 in above the apparatus floor. Of these exits, eight terminate after 1 inch to serve as decoy exits.
We provide a single heated safety box with a 90 degree angle to prevent visual pre escape cues. This box is sold separately to reduce cost and can be obtained A-la-carte.
Visual Cues can be provided upon request to place inside the apparatus for spatial navigation. The goal of the apparatus is to encourage the rodent to reach a food reward and warmth within the goal box. Experimenters typically fill the tub with one inch of cold water (12–14 C) to motivate escape behavior.

Suggested Color

Black, Blue, White

Available

4 FEET TUB **5 FEET TUB**

6 FEET TUB

Bowtie Mazes

Bowtie mazes are used for a variety of choice experiments for mice and rats. We offer two separate models frequently used and cited in the literature:
Model 1: Used for projection experiments onto the floor. Smaller and more compact. Can be later converted into a choice experiment as well with the inclusion of a small separator.
Model 2: Used for choice experiments for mice and rats. Complex IDED experiments can be performed.

Suggested Color

Model 1: Clear, White, Grey, Black
Model 2: Solid White, Grey, Black

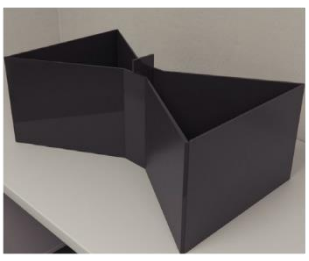
Available

Projection

Mouse **Rat**

Choice

Mouse **Rat**



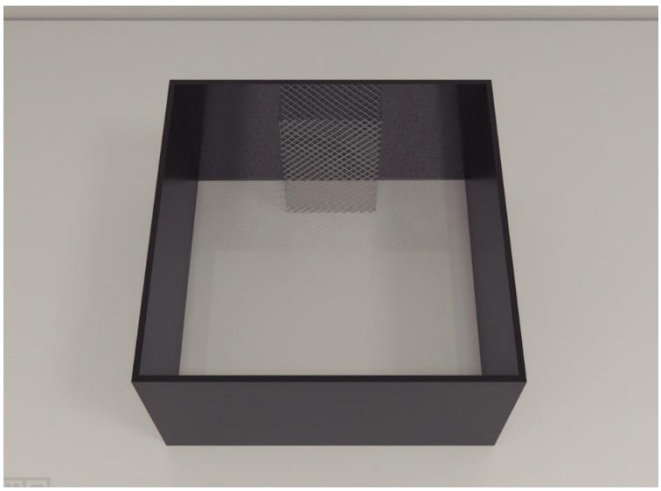
3D Radial Arm Maze

3D Radial Arm Maze is a modified version of the Radial Arm Maze developed by Abdel Ennaceur in 2006. Ennaceur's 3D radial arm maze became a groundbreaking venture because of the unique design; the subjects exposed to unfamiliar open spaces without a safe alternative.
The 3d Radial Arm maze test utilizes open spaces and spatial navigation both horizontally and vertically. Flattened, Raised, and lowered arms allow for a high degree of flexibility in various experiments. Removable top allows for easy storage.

Suggested Color
White

Available

Mouse **Rat**



Social Interaction Test

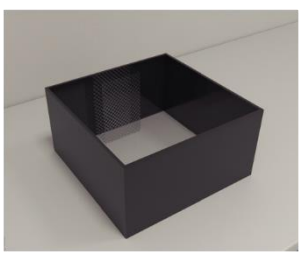
The social interaction test used was based on the social approach avoidance test previously described by Berton et al. (2006). In the experimental procedure, each animal was placed in the center of a square arena. Animals are allowed to fully explore the arena twice, under two different experimental sessions. In the first ("object" session), an empty perforated plexiglass cage is placed in the middle of one wall of the arena. In the second session ("social" session), an unfamiliar rodent is introduced into the cage as a social stimulus.

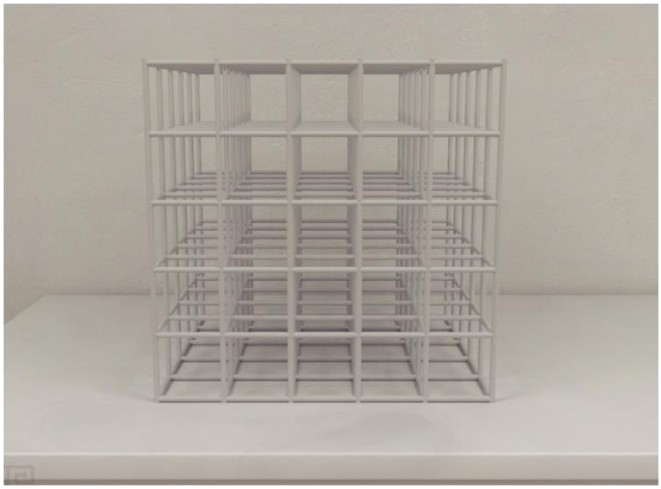
Mazeengineers offers the social interaction test for both mice and rats. Custom coloring and customization available upon request.

Suggested Color
Black

Available

Mouse **Rat**





Cubic Maze

The sentinel use of the cubic maze was for comparing rats vs. hummingbirds in their ability to navigate both the horizontal vs. vertical planes based on the modality of transportation. This interesting apparatus allows for interrogation of rodents in the horizontal and vertical axis and can be baited with sucrose reward throughout multiple locations.

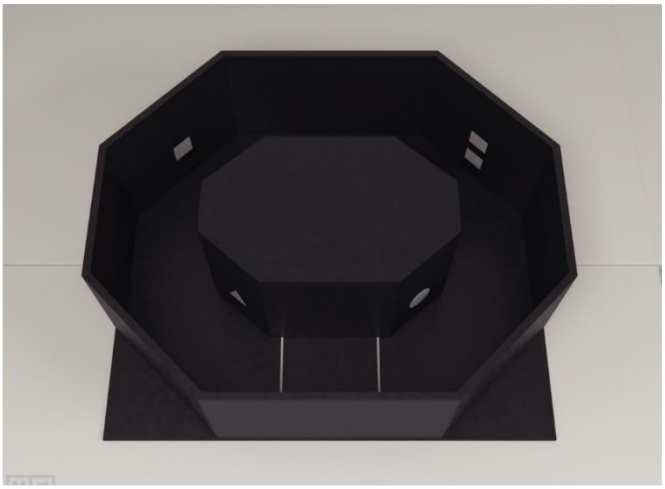
Sizing for mice, rats and hummingbirds available. Customization possible upon request. Multiple colors available.

Suggested Color

Grey

Available

Mouse **Rat**



Whisker Guided Exploration

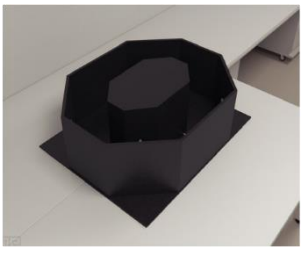
The sentinel paper for the whisker guided exploration was used in rats. The maze inquiries voluntary exploration of an oval circuit with decreases in the number of rears and reversals and changes in the predominant location for injured rats, which spend more time in the inside of the turn compared to the outside. It is also expected that rats increased thigmotaxis after sham and brain-injury.

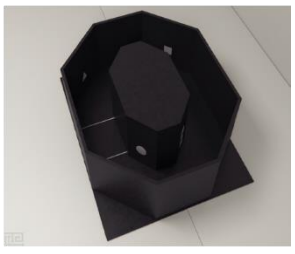
Suggested Color

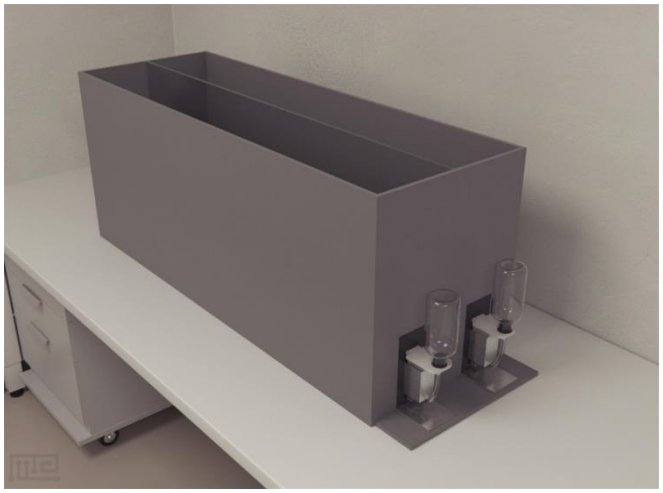
Black

Available

Mouse **Rat**







Social Cooperation Chamber

A chamber is vertically divided into two lands with a transparent, perforated divider for visual illumination and auditory cues. Tactile cues are also shared between the two chambers given two lanes are shared on a continuous floor, and olfactory interactions between mice and rats are possible. 3 zones are created between two lanes.

Automation with IR beam and automated water spout.

Upon the fulfillment of the computerized algorithm of cooperative condition, the peristaltic pumps provide mutual reward (70µl, 20% sucrose drop) through the liquid dispensers.

Re-gaining of mutual reward requires additional coordinated movement from zone “A” to “C”

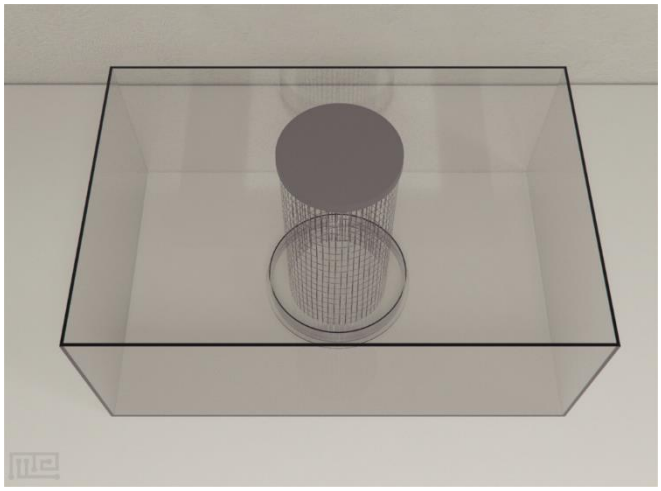
Sizing from Mazeengineers is offered for both mice and rats. Custom coloring and sizing available as well.

Suggested Color

Grey

Available

Mouse **Rat**



Pawedness Trait Test (PaTRaT)

The Pawedness Trait Test (PaTRaT) is designed to observe the degree of pawedness in rodents and its association with neural behaviors like motor activity, cognition, impulsivity, and memory. The PaTRaT apparatus is based on preference paradigm allowing the subject to use any of its paws for manipulating the food reward during the experiment. The preference for using right or left arm is linked with monoamines’ asymmetry and dopaminergic activity found in an individual’s brain (Barnéoud, Moal, & Neveu, 1990).

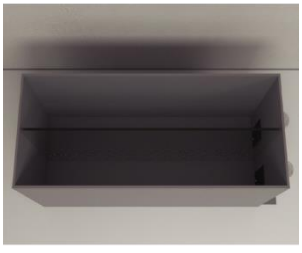
The PaTRaT is available from MazeEngineers in both Mouse and Rat forms.

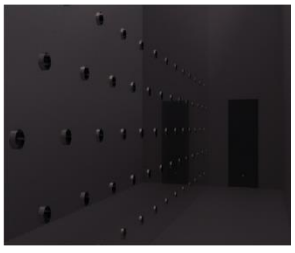
Suggested Color

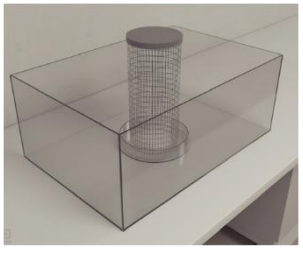
Clear

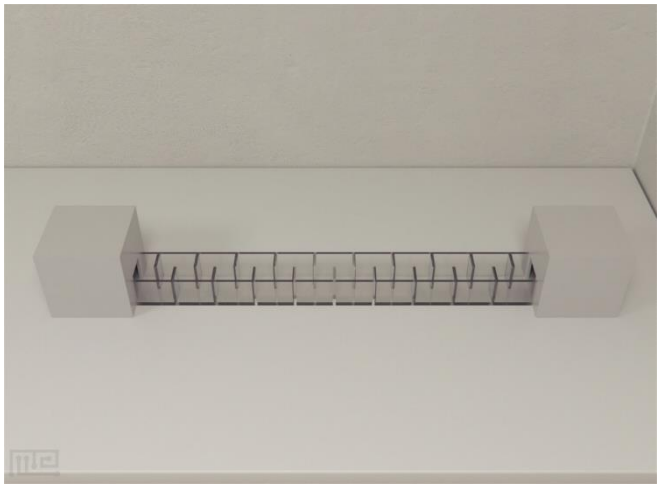
Available

Mouse **Rat**









Flex Maze

This maze was first described in the literature by Sato et al (2017) for learning and memory. The device comes with five vertical and five horizontal corridors that allows for a flexible construction of routes. Similar to the Hebb Williams maze, successively more difficult modular tests are performed on the rodent to create environments that challenge spatial learning memory. The device from MazeEngineers is available for both mice and rats.

Suggested Color

Black

Available

Mouse **Rat**

Climbing Tower: Resistance Exercise System

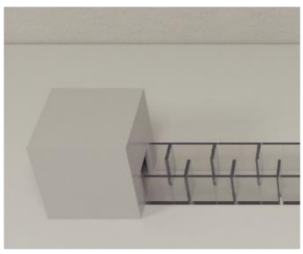
The MazeEngineers rodent climbing tower is a rodent housing with a steel wire mesh wtih cross stripes of approx 5mm. Mice are encouraged to voluntarily climb the 100-cm tower to drink water from bottles placed at the top of the tower. Includes bottle.

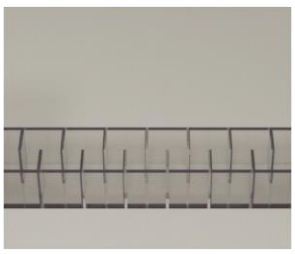
Suggested Color

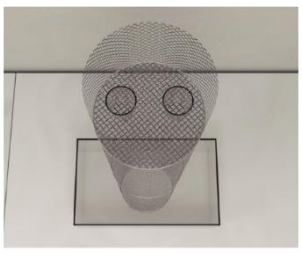
Clear

Available

Mouse **Rat**







Incline Rolling Ladder

Incline rolling ladder test is a novel test sensitive to tactile and proprioception sense. Fagoe et al. developed incline rolling ladder test to study functional deficits in rats.

Incline rolling ladder is made up of a ladder opening to a platform, set at an angle of 45 degrees with rungs that have an immobile textured part, and a movable rolling smooth part. The subjects are allowed to climb the ladder to reach the platform. The data is collected about the number of successful steps, the number of slips, and the parts these occurred from.

Suggested Color

White with Black

Available

Mouse **Rat**

Grid Test

The grid test is a simple, widely used, and inexpensive test that measures long-term behavioral deficits in mice, especially in the parkinsonian literature. Multiple variants have been described, and modifications are available to ensure video grading compli - ance. MazeEngineers offers the regular grid test with two variations, a vertical grid test variant, and a horizontal grid test variant.

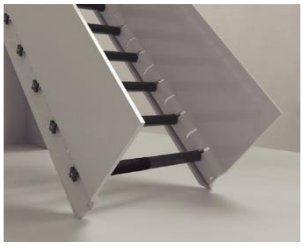
Suggested Color

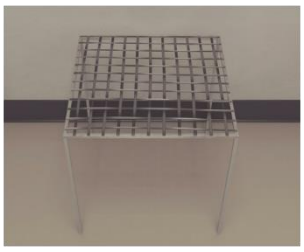
Grey

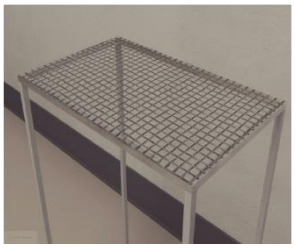
Available

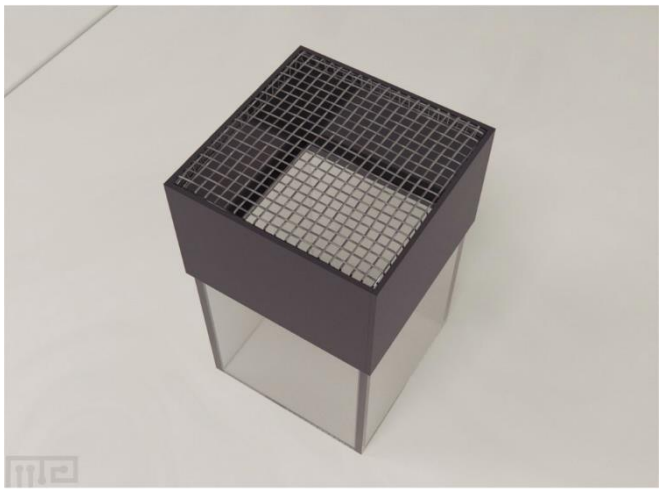
Version 1 **Version 2**

mazeengineers.com/portfolio/grid-test









Horizontal Grid Test

The horizontal grid apparatus is a vertically positioned grid box mounted with plexiglass, which allows the mouse to grab on the grids as it climbs down. The MazeEngineers modification of the previously published apparatus (Tillerson et al., 2002; Tillerson and Miller, 2003) is based on Kim et al (2010). For experiments, the apparatus was first placed on the floor with the grid side on the bottom, and a mouse was lifted by its tail and placed inside the box. Once the mouse stably grabbed on the grids with all four paws, the apparatus is inverted so that the mouse hangs from the grid.

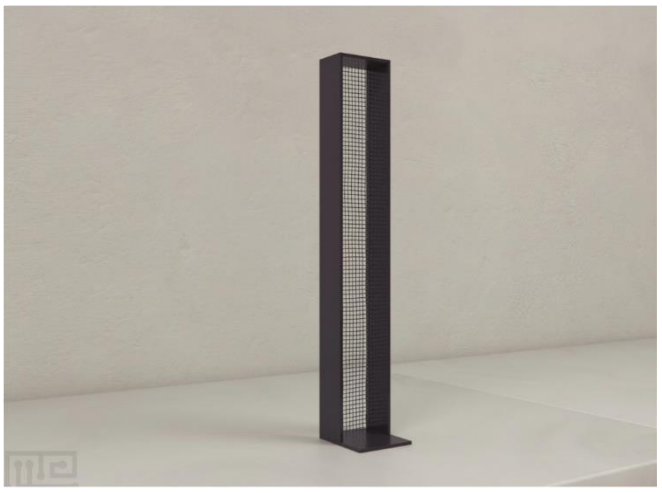
Available for mice and rats. Multiple colors available.

Suggested Color

Black and Clear

Available

Mouse **Rat**



Vertical Grid Test

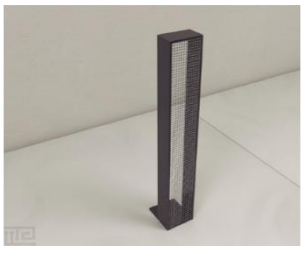
The vertical grid test is similar to the horizontal grid test first described by Kim et al (2010) to assess motor function. The apparatus is a vertically positioned grid box mounted with acrylic, and this allows the mouse to grab on the grids as it climbs down. The MazeEngineers vertical grid apparatus allows simple motor assessment, is lightweight, and available for mice and rats. Multiple colors available.

Suggested Color

Black

Available

Mouse **Rat**



Stairway Test

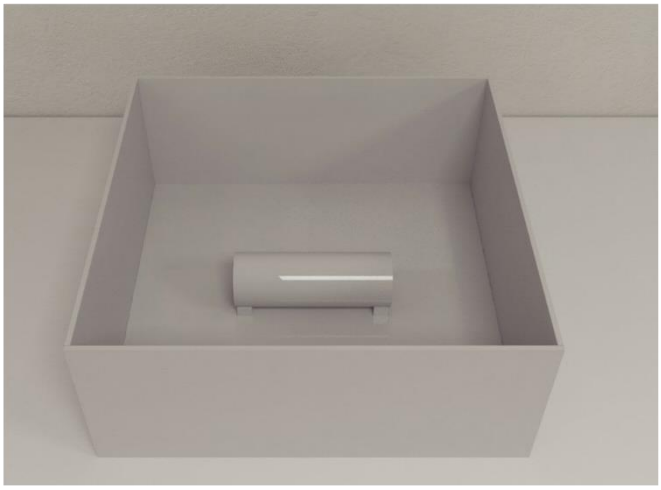
The Stairway Test Apparatus originally described in the literature for MCAO stroke models in rats by Boltze et al (2006) in Germany. It is a robust, cost-effective, and highly reproducible, test system for evaluating motor lesions. multiple ladder rungs lead to a home cage environment. It requires little pretraining and is a more sensitive test for subtle perturbations in motor function.

Suggested Color

Black, White, Grey, Blue

Available

Mouse **Rat**



Emergence Test

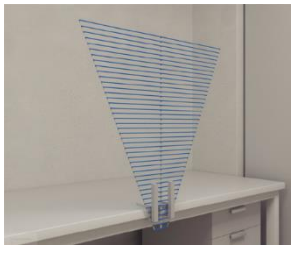
Rodents are placed in a closed opaque cylinder (21 cm x 7cm x 7 cm), that is set within an open field and secured to prevent rolling. The lid of the cylinder is removed and the latency for the rat to emerge completely from the cylinder is recorded by a human observer.

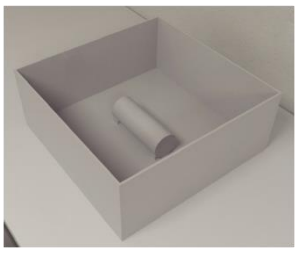
Suggested Color

Grey

Available

Mouse **Rat**





Tilt Ladder

The rodent tilt ladder was originally described in the literature in 1989 in physiologic saphenous vein experiments, where rodents were kept in a tilt state. The tilt ladder can additionally be used in many other motor function experiments as it is combined with a ladder like grounding and moved to any angle needed to obtain a reward.

Suggested Color

Clear

Available

Mouse **Rat**

FTIR Walkway

6 components:

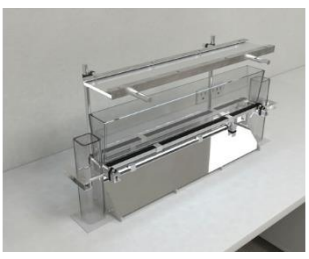
1. fTIR wwalkway
2. Support Post
3. Walkway wall
4. 45 degree mirror
5. Background backlight
6. Walkway wall/post clamp

Suggested Color

Metalic silver

Available

Mouse **Rat**



Water E Maze

Water E maze is a novel paradigm used to evaluate empathy and social behavior in rodents. The brain regions associated with empathetic behavior include the prefrontal cortex and subcortical emotion generating systems. Empathetic behavior has underlying cognitive functioning that varies depending on social, environmental, and temporal conditions. The Water E maze task utilizes pain sensitivity in response to conspecific distress and social factors in rodents to evaluate empathetic motivation (Schwartz, Silberberg, Casey, Kearns, and Slotnick, 2017). The use of rodent models helps advance the understanding of empathy impairments observed in neuropsychiatric disorders and the ontogeny of social behavior. In addition to emotional contagion and prosociality, the task permits the detection and demonstration of affective states of social responses and fear-induced behavior.

Suggested Color

Clear

Available

Mouse **Rat**

Double T Maze

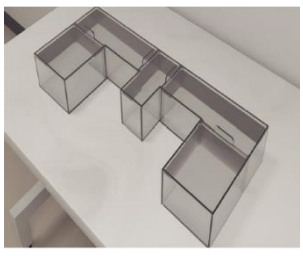
The double T maze apparatus consists of two T mazes with a start box. Through a sliding door, two compartments of each T maze are separated by a movable portioning wall. The partition wall between compartments are transparent and perforated, so rodents can smell and visualize cues. Custom sizing and coloration available.

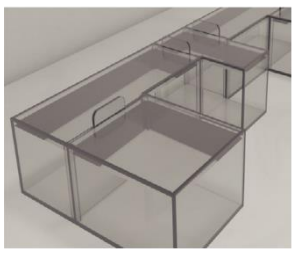
Suggested Color

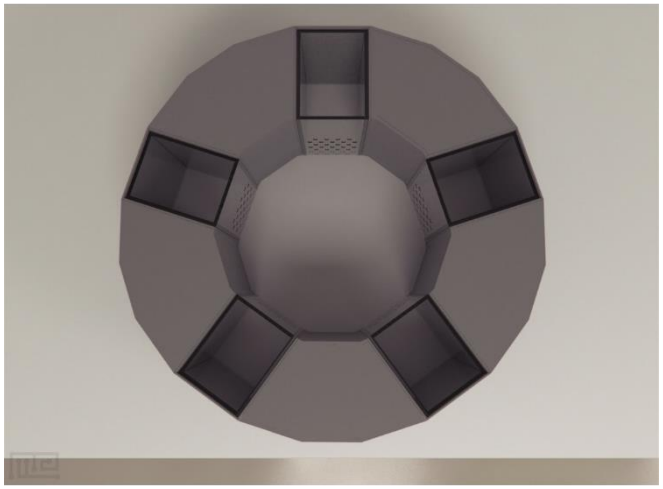
Black, Blue, White, Grey

Available

Mouse **Rat**







Sociobox

The sociobox consists of an acrylic apparatus with an outer ring of five rectangular removable boxes separated by fixed dividers surrounding a central open arena.

Experimental rodents are placed in the central arena, while stimulus mice are placed in the inserts in the outer ring. The sociobox allows for social interaction testing .

Suggested Color

Grey

Available

Mouse **Rat**

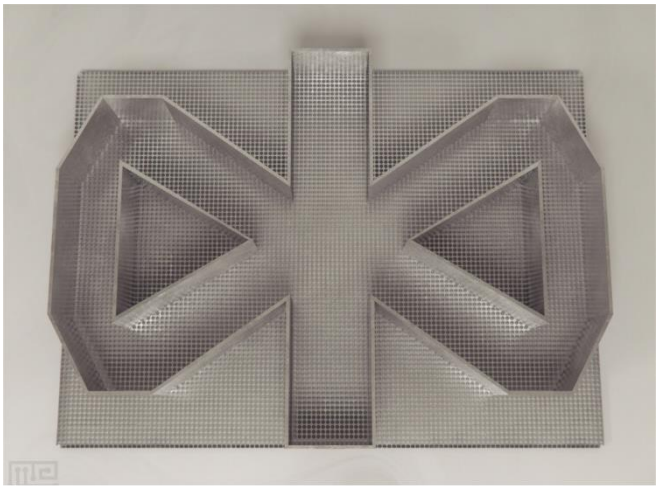


Figure 8 Maze

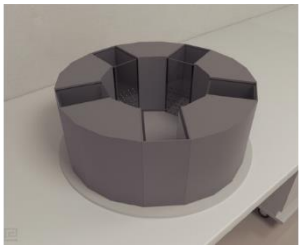
The Figure 8 maze is made of stainless steel along with clear polycarbonate. lids to prevent rodent escape. The first utilization of the figure 8 maze was used to demonstrate the social and experiential factors that influence the development of motor activity in rat pups. The device can be used as a generalized motor activity arena and has been sized for both mice and rats.

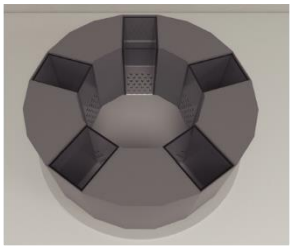
Suggested Color

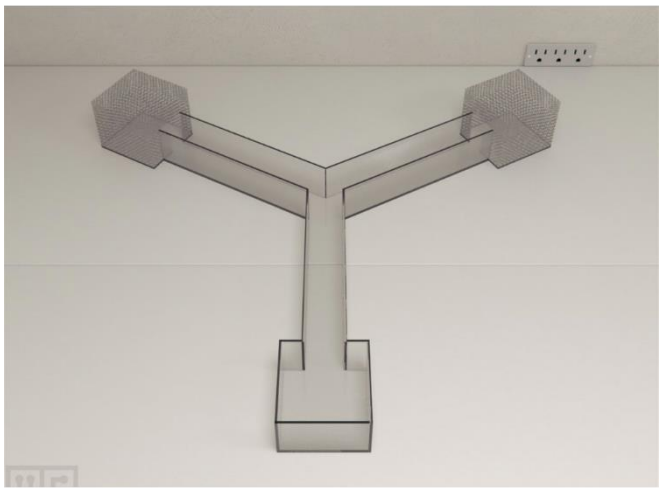
Grey

Available

Mouse **Rat**







Social Y Maze

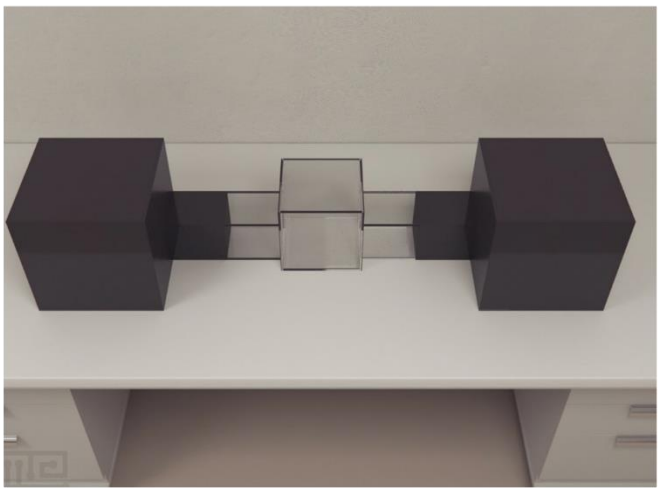
The Y maze with a social interaction cage was first described by Weber-Stadlbauer et al and replicated by Vuillermont in analyzing social interaction choices in rodents. Sizes are standard for mice and rats, but with the key modification being pair of rectangular wire grid cages. In the protocol, one wire cage contained an unfamiliar rodent (usually same sex as test mouse), and the other one contained a “dummy object.” The Mazeengineers modification of the Y maze includes two removable rectangular wire grid cages for social interaction. This modification is an add on to the regular Y maze and requires separate purchase of the Y maze.

Suggested Color

Black, White, Grey, Blue, Clear

Available

Mouse **Rat**



Marmoset Light Dark Box

This apparatus was first described by Wang et al (2014) for Marmosets, a non-human primate model. Priorr to this seminal study, little was known about light-dark preference in marmosets. The modified apparatus provided by Mazeengineers consists of three compartments:

Compartment 1: open transparent area

Compartments 2/3: two closed opaque compartments that can be light or dark

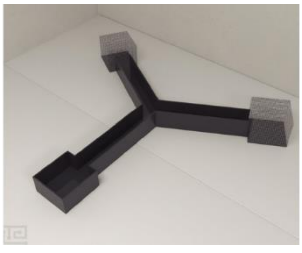
In the primary study, both adult and young marmosets explore the open area, with younger marmosets showing increased interest. When one of the closed compartments was light and the other dark, the adult marmosets showed a preference for the dark compartment. Young marmosets have no preference.

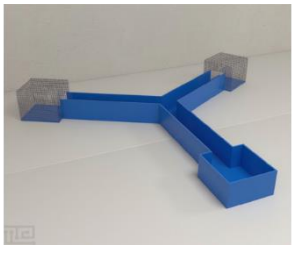
Suggested Color

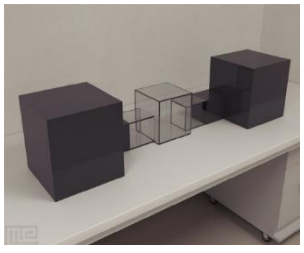
Black with Clear

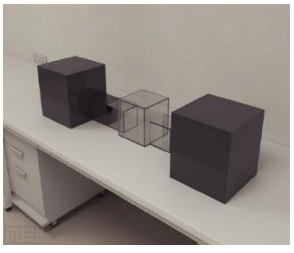
Available

Marmoset









Stress Alternatives Model Maze

The Stress Alternatives Model Maze is described in the literature for stressful social decision making experiments. The device utilizes opaque holding cylinder as well as escape cylinders with a small escape route on opposite ends.

Suggested Color

Black, Blue, White, Grey, Red, Clear

Available

Mouse **Rat**

Active Place Avoidance

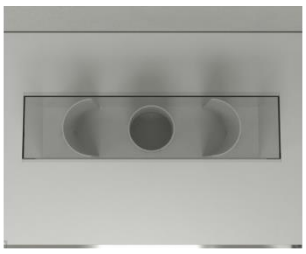
The APA is a circular metal arena shock grid underneath a rotating arena. The subjects are allowed to explore the arena while avoiding a prohibited sector using visual cues in and around the arena. Punishment in the form of shock is delivered to the subject if it enters the prohibited sector. Passive avoidance is observed when the arena is not rotating while active avoidance is observed when the arena is rotating.

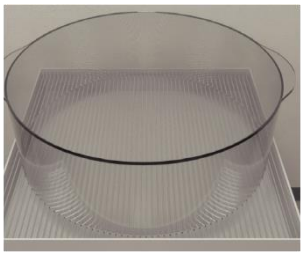
Suggested Color

Grey

Available

Mouse **Rat**





Automated Hole Board

The MazeEngineers automated hole board system allows for easy detection of nose poke behavior in the context of an open field environment. The apparatus that we provide allows for maximum flexibility including the ability to interchange acrylic walls for colored walls (both included in your order), nose pokes, and floor interfaces. Your order comes with the conductor software to allow for easy control of the hole board apparatus as well as logging of data during your automated experiment. Get the best results for maximum convenience.

Suggested Color

Clear, White, Black

Odor Box Accessory

Digging Odor kit comes with the following odors (500 Trials): Nutmeg, Rosemary, Cinnamon, Clove, Red thyme, Ginger, Vanilla, Lemon, Raffia, Foam

Available

Mouse **Rat**

AeroDeliver System

The AeroDelivertm system is a noninvasive, high-throughput, and valuable toolkit for the study of nicotine addiction, toxicology, teratogenicity and tobacco-related diseases in rodents. The system employs nose-only and free-moving nicotine exposure devices that deliver alveolar region-targeted aerosol to rodents. The system enables controlled drug delivery via nose-poke or lever pressing. The aerosol delivery system produces safe and stable levels of drug vapors in the air with minimum equipment requirements, enabling the researchers to model behaviors of drug dependency by noninvasively delivering the test substances in aerosol form to rodents.

The aerosol delivery chamber allows control over the amount of the aerosols entering the systemic circulation and the brain of the test animal. The AeroDelivertm system solves the problem of difficult administration routes for rodents by giving rodents access to substance vapors in individually controlled small chambers. Also, the system provides a flexible approach to accommodate multiple deliveries and dosage regimens in the same cohort of rodents. The AeroDelivertm system allows access to the animals while they are exposed to drug vapors, which also permits the administration of test compounds and sampling of biological fluids without disturbing the drug concentration and environment.

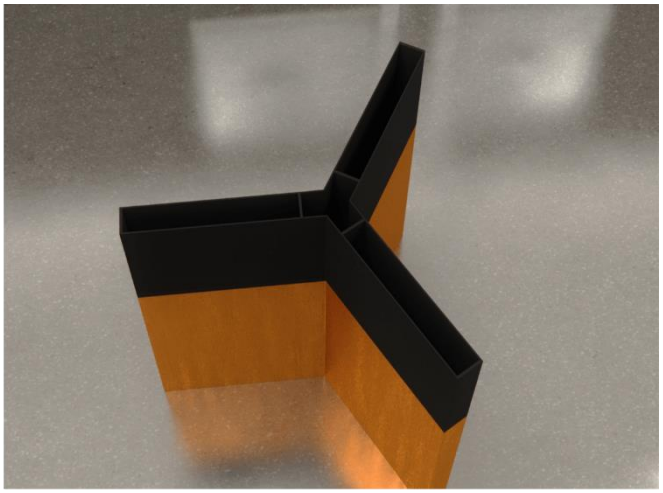
The size and easy handling of the vapor chambers allow them to be used in any laboratory space. The method is not labor-intensive for research personnel and only requires minimal training. It can also be used for longer experiments (weeks to months) without stressful manipulations (e.g., injections or pump implantation). This system is valuable for use in both rats and mice, with the only difference being the size of the chambers.

Suggested Color

Grey

Available

Mouse **Rat**



Automated Y Maze

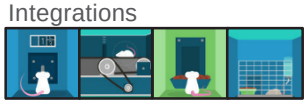
The Y maze is an enclosed apparatus in the form of a Y placed horizontally, similar to the T maze. Animals usually start from a stem of the Y Maze (arbitrarily chosen) and allowed to spotaneously alternate between the arms. The test relies on either spontaneous alternation or rewarded alternation(1). The Maze Engineers automated Y maze uses automated detection so that the mouse or rat can can be held in the center area with a freeze time, allowing for many trials without human intervention, maximizing ease of use and automated experiments.

Suggested Color

Blue, Grey, Black, White & Clear

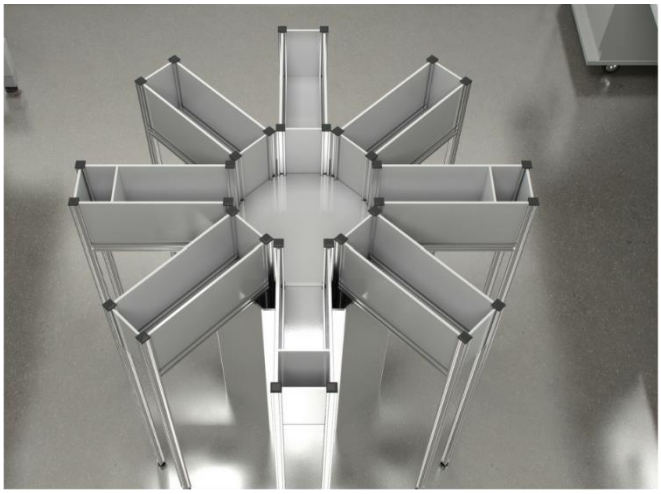
Features

Integrations



Available

Mouse **Rat**



Automated 8 Arm Radial Maze

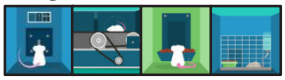
The 8 Arm Radial maze is an apparatus widely validated for spatial learning tasks. Using external cues outside of the maze, arms can be baited and the number of arm entries to collect all 8 rewards can be measured. Poor spatial working memory correlates well to increased return to arm choices and overall time to finish the task. The Maze Engineers automated 8 arm radial mazes create entirely automated environments to minimize anxiety and fear created by the human experimentor while collecting high volumes of data.

Suggested Color

Blue, Grey, Black, White & Clear

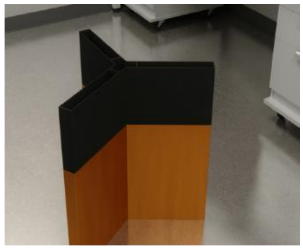
Features

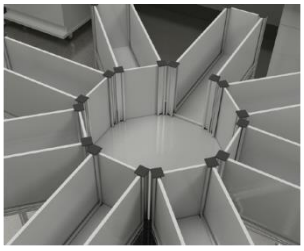
Integrations

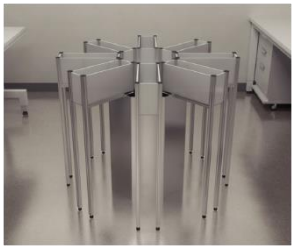


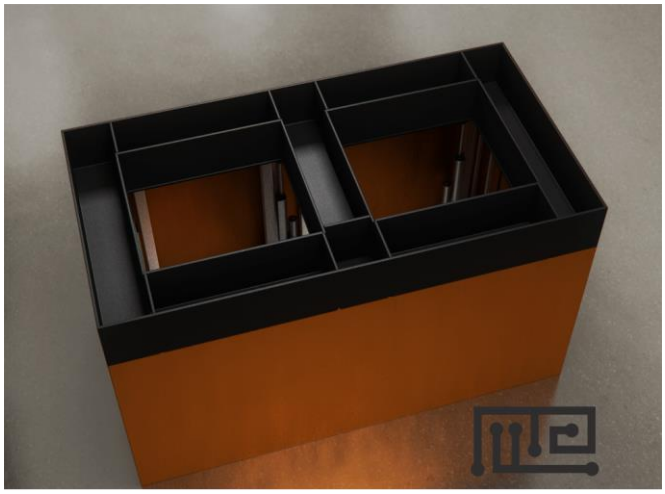
Available

Mouse **Rat**









Automated T Maze

The T maze is an enclosed apparatus in the form of a T placed horizontally, similar to the Y maze. Animals usually start from the base (long arm) of the T and allowed to choose one of the goal arms. The test relies on either spontaneous alternation or rewarded alternation(1). The Maze Engineers automated T maze uses a return to start module so that the mouse or rat can automatically return to the start area without human intervention, maximizing ease of use and automated experiments.

Suggested Color

Blue, Grey, Black, White & Clear

Features

Integrations

Available

Mouse **Rat**

SmartCage System

The SmartCageTM system is an automated non-invasive rodent behavioral monitoring system. The SmartCageTM system is a versatile, flexible, and user-friendly system that enables the biomedical researchers to conduct a variety of neurobehavioral assays for phenotypic analysis, in vivo drug screening, and assessment of neurobehavioral toxic compounds before testing in individual disease models through consistent and accurate monitoring of rodent home cage activity.

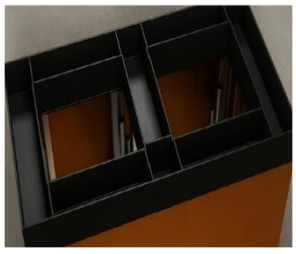
The SmartCage™ system is widely used for quantitative characterization of basic behavioral elements and their patterns in freely moving rodents. Each SmartCage™ system consists of a floor-vibration sensor, a motor control, an instrument amplifier, microcontroller units, an infrared (IR) matrix, and flexible modular devices. The system is non-invasive as it allows the animals to be tested and monitored in their home cages having bedding, food, and water, making the system valuable to conduct experimental manipulations and behavioral assessments for extended periods. The system automatically measures wake/active and sleep/inactive states. Locomotion (travel distance, travel time), rearing up counts, and animal movement patterns, for example, rotations (cycling) are the home cage activity variables that are recorded to develop the behavioral analysis.

Suggested Color

White

Available

Mouse **Rat**



Automated Elevated Plus Maze

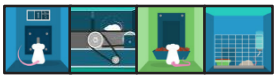
The Elevated Plus maze is an apparatus widely validated for anxiety and fear experiments. Using the natural aversion to open spaces, time between the closed arm and open arm is measured as a method to investigate unconditioned fear. The Maze Engineers automated elevated plus maze uses quiet automated doors in conjunction with infrared detection in 17 different zones to create an elevated plus maze that minimizes human investigator fear confounders and maximizes your data collection.

Suggested Color

Blue, Grey, Black, White & Clear

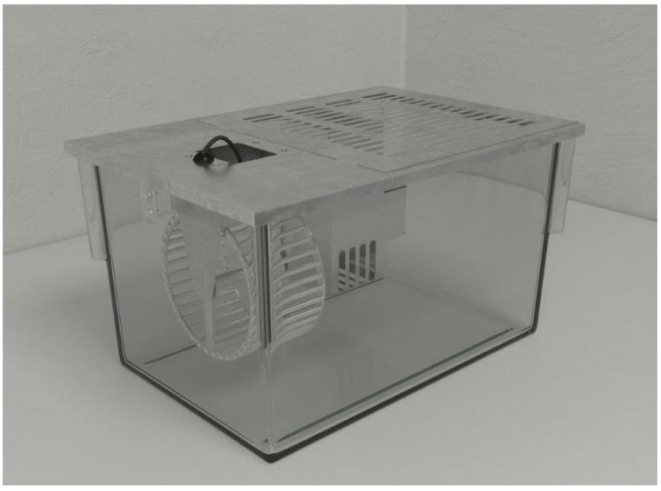
Features

Integrations



Available

Mouse **Rat**



Activity Cage

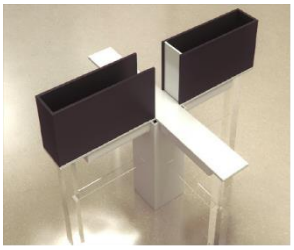
Activity wheels can be used in neuroscience to assess the activity of the circadian system. Circadian rhythms are important biological processes that allow the adaptation of physiological systems to cyclic environmental changes. Gene expression, hormone levels, and many behaviors are all known to be regulated in a circadian pattern. Although these rhythms are usually robust, there are a number of genetic, pathological and pharmacological factors that can affect them. The physiological consequences of these instabilities can potentially disturb many bodily functions and processes. A number of neurological, neurosensory, and neurobehavioral disorders have associated circadian rhythm disturbances (e.g. Roybal et al, 2007).

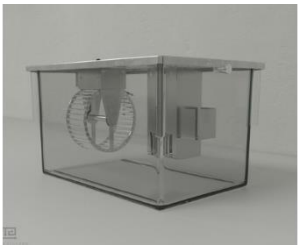
MazeEngineers offers activity wheels with home cages. Inquire for more information.

Suggested Color

Grey and Clear

Available





Sleep Deprivation Apparatus (Walking Model)

Sleep deprivation (SD) impairs spatial, emotional, and working memories, and augments anxiety like behaviors. The walking model of sleep deprivation apparatus from MazeEngineers is an automated device that provides movement at researcher programmed intervals to prevent REM sleep. Food and water apparatuses are available to allow long term experimentation. Please note that this is one of two possible sleep deprivation models, the other being the intracage sleep deprivation apparatus.

The software can freely add protocol , set the forward motion, reverse motion, and rest time
Sound stimulation frequency is adjustable
Safe for animals
Each apparatus can operate 8 mice or rat simultaneously
LCD screen + computer software control
Includes both water and food supply for long term sleep deprivation.
Running and rest time can be cycled.

Suggested Color

White and Clear

Available

Sleep Deprivation Apparatus (Cage Model)

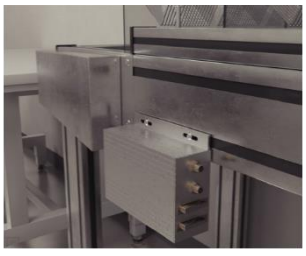
This sleep deprivation apparatus uses a cage model to provide a standard living environment that includes food and water support. It does not require the animal to be in a walking state unlike the walking sleep deprivation apparatus from MazeEngineers. It can scan the bottom of the cage with a deprivation rod with an adjustable cycle to achieve an experimental environment for animal deprivation.

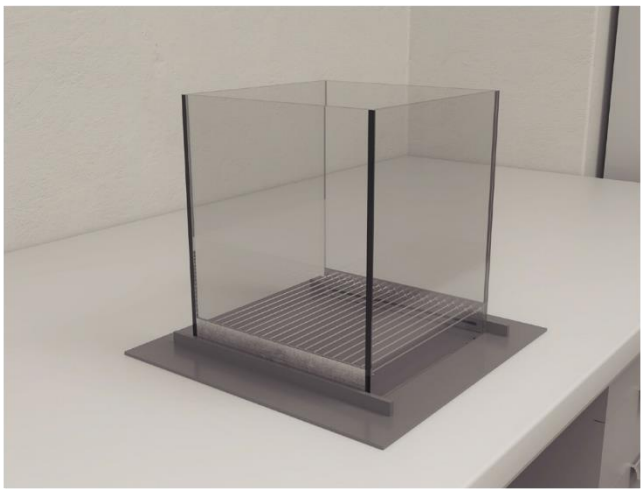
There are three modalities for sleep deprivation equipment: Rotating drum(not available through MazeEngineers), Cage model, and Walking Platform. This Cage model is driven by a motor to rotate a bar that moves along the cage continuously; the experimental animals passively follow the bar which prevents sleep.

Suggested Color

Grey with Black

Available





Parallel Rod Test

The parallel rod floor test was originally described in the literature by Kamans and Crabbe (2007) as a simple model of ataxia in mice. In the original protocol, both ataxia and locomotor activity can be measured. The test allows researchers to quantify differences in motor coordination MazeEngineers offers multiple manual versions of the Parallel rod test, including a more refined simple rod within an open field (without video grading), as well as a model to replicate the original Kamans and Crabbe paper.

Suggested Color

Clear

Modifications Available

• Kamans and Crabbe Model

Available

Mouse **Rat**

Mouse Set of 4 **Rat Set of 4**

Rotarod

The Rotarod is a widely used behavioral task to assess motor performance in rodents using the natural fear of falling as motivation. The MazeEngineers Rotarod comes with a touch screen device and can be customized for speed, acceleration, and is connected and controlled using the easy to integrate Conductor Software (Free with the order).
Dividers prevent mice from entering other lanes. Minimal height & soft landing prevents harm after fall from the bar. The rod itself has horizontal ridges to help the mouse hold onto the rod.

Suggested Color

Black

Features

•Precision Control
•Smart Fall
•Live Screen
•Data Control

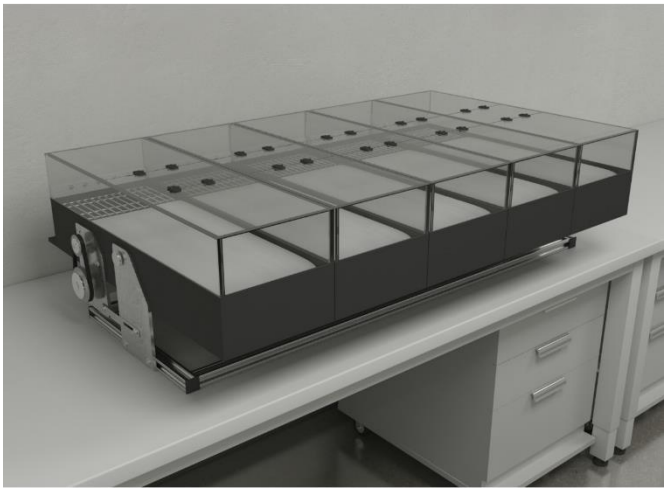
Available

3 Lane:

Mouse **Rat**

6 Lane:

Mouse **Rat**



Treadmill

The Maze Engineers automated Treadmill utilizes ultra quiet precision mechanical mechanisms to deliver the best possible treadmill on the market
Easily customizable: Can be combined with any maze for brand new activity protocols and unique habitat enclosures.

Suggested Color

Black, Clear

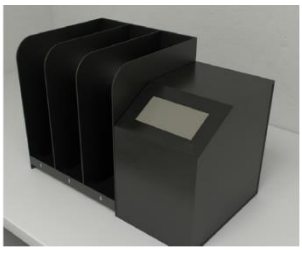
Available

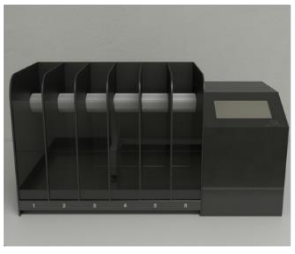
Mouse **Rat**

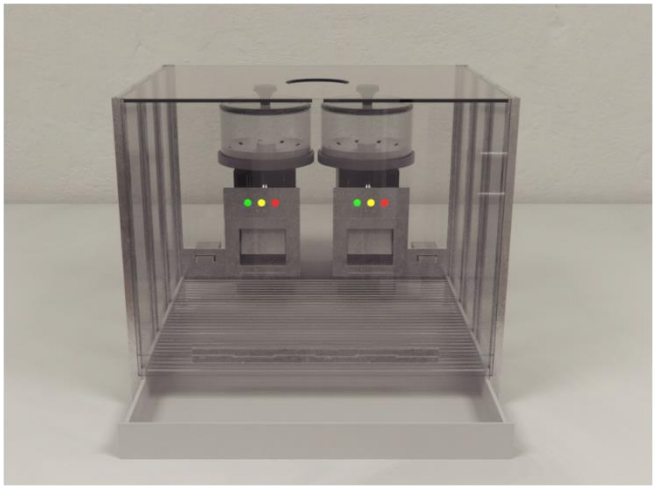
Mouse double **Rat double**

Mouse 5 Lane **Rat 5 Lane**

mazeengineers.com/portfolio/treadmill







Self Administration Chamber

The self administration chamber from MazeEngineers come with everything you need for operant lead self administration. The chamber comes with a Sound attenuating cubicle with light/fan, syringe pump system, cage with two port lights and retractable levers, shock floor grid, and two pellet receptacles.

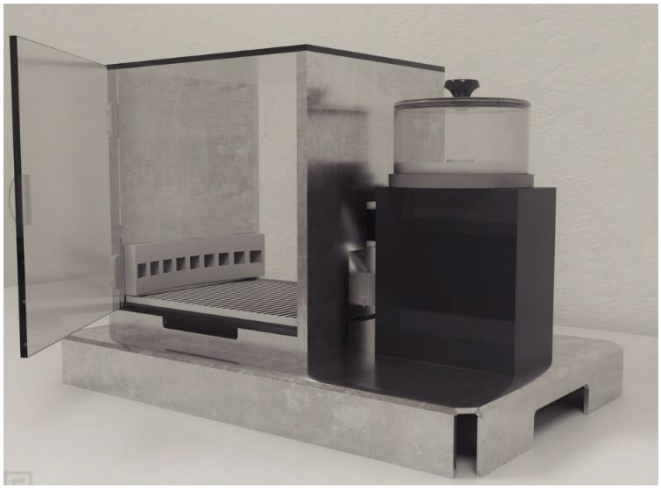
Suggested Color

Clear

Available

Mouse **Rat**

mazeengineers.com/portfolio/self-administration-chamber



Five Choice Serial Reaction Time Task (5CSRTT)

The 5CSRTT apparatus consists of an operant conditioning chamber with 2 Plexiglas sidewalls; the aluminum front wall is rounded and contains five nose poke apertures (2.5 x 2.2 x 2.2 cm each, 2 cm above the floor)

Each apparatus you purchase from MazeEngineers comes with a stimulus LED light as well as infrared nose poke sensor.

A stainless steel back wall has a food cachet installed which provides food pellets from the pellet dispenser. Infrared sensor and an LED signal light. included

Shocker floor grid allows for punishment in the experiment. Removable feces and urine tray below this grid allows for easy cleaning.

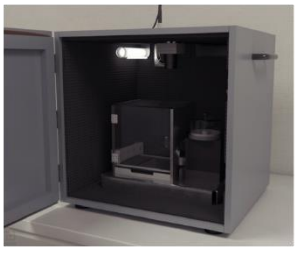
Suggested Color

Grey with Black

Available

Mouse **Rat**

mazeengineers.com/portfolio/five-choice-serial-reaction-time-task-5csrtt



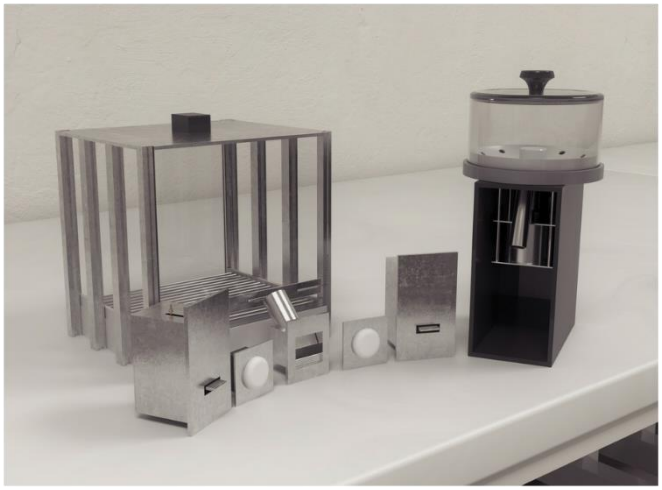
Tier 2 Lever Package

Base includes:
• Standard mouse/rat chamber
• House light, feces catcher, shocker
• Note house light is a standard operant light (white) on ceiling

Pellet dispensers (2)
LED lights (2)
Mouse/Rat levers (2)
Dual food receptacle
Sound

Available

Mouse **Rat**



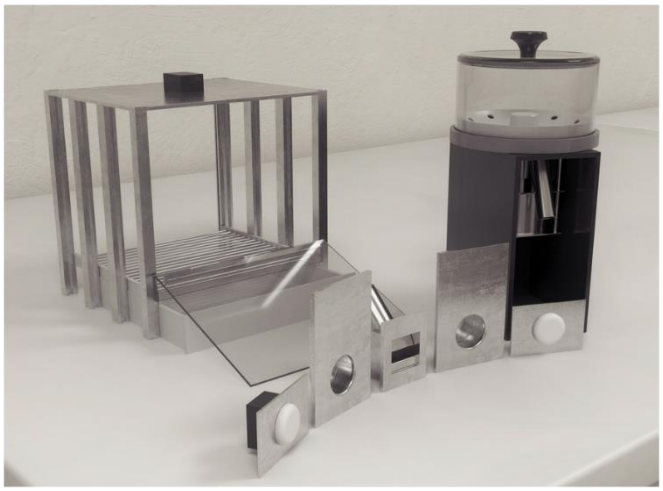
Tier 1 Lever Package

Base includes:
• Standard mouse/rat chamber
• House light, feces catcher, shocker
• Note house light is a standard operant light (white) on ceiling

Pellet dispenser
LED lights (2)
Mouse/Rat levers (2)
Trough receptacle

Available

Mouse **Rat**



Tier 1 NosePoke Package

Base includes:
• Standard mouse chamber
• House light, feces catcher, shocker
• Note house light is a standard operant light (white) on ceiling

Pellet dispenser
LED lights (2)
Mouse levers (2)
Trough receptacle

Available

Mouse **Rat**

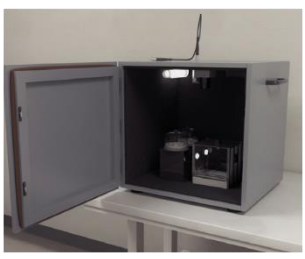
Tier 2 NosePoke Package

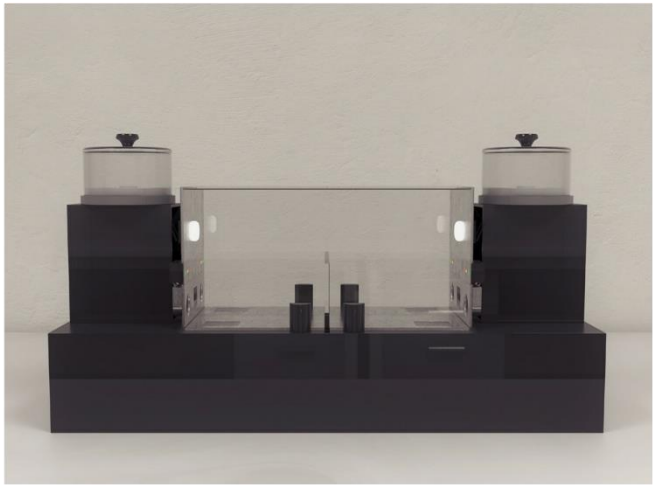
Base includes:
• Standard mouse/rat chamber
• House light, feces catcher, shocker
• Note house light is a standard operant light (white) on ceiling

Pellet dispensers (2)
LED lights (2)
Mouse/Rat nose poke (2)
Dual food receptacle
Sound

Available

Mouse **Rat**





IDED Operant Chamber

The Operant IDED set shifting task chamber from MazeEngineers includes the following parts per chamber as listed below. Controlled using the Conductor software, which comes free with your order. The software collects and logs data while simultaneously allowing you to control the operant chamber and set up easy to configure experiments. Easy save for each experimental module you set up in Conductor, with integration to Ethovision and Neuralynx, and Pulsepal. Easy to modify for all future scenarios as well.

- Visual stimuli (2 LED's)
- Food magazine
- Nose poke holes
- 2 Tactile stimuli
- Olfactory stimulus
- Automatic sliding door
- House light
- IR beam between the two chambers for door control

Suggested Color

Black

Available

Mouse **Rat**

Step Down Avoidance

The step-down apparatus consists of a contextual Acrylic chamber with an electrified grid floor, with an elevated vibrating platform in the center.
The platform is connected to an actuator that forces the platform to shake. When the animal steps off of the platform to the electrified grid, the platform stops its vibration, and the software counts the latency to step down.

Suggested Color

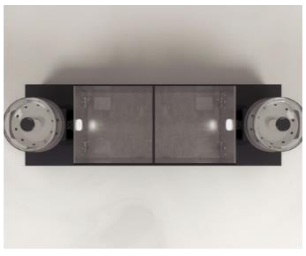
Clear

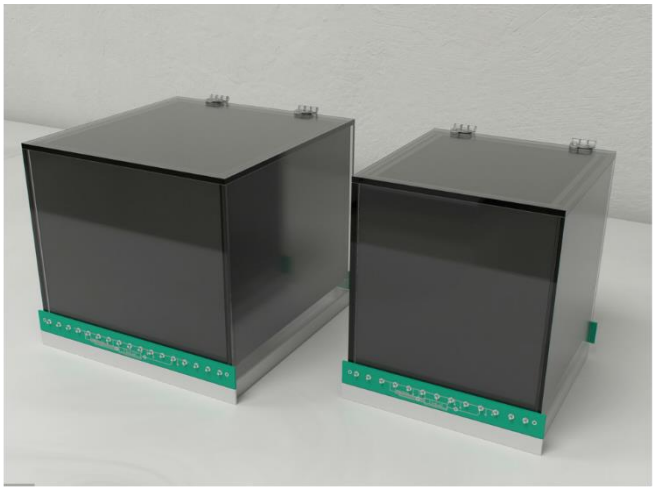
Features

- Vibration
- Shock
- Contextual Plates
- Conductor Integration

Available

Mouse **Rat**





Learned Helplessness

The learned helplessness paradigm is a widely used animal model of depression originally described by Overmier and Seligman (1967), who observed that exposure to inescapable shock resulted in dramatic deficits in emotional expression, associative learning and behavioral coping when presented to an aversive but escapable stimulus. The MazeEngineers learned helplessness apparatus is designed to maximize your time and grant dollars for data output. The device can be configured with multiple shock configurations and also flexible contexual cues means use of operant conditioning in the learned helplessness experiments. Integration with Conductor means Neuralynx and Ethovision seamless software integration without I/O boxes.

Suggested Color

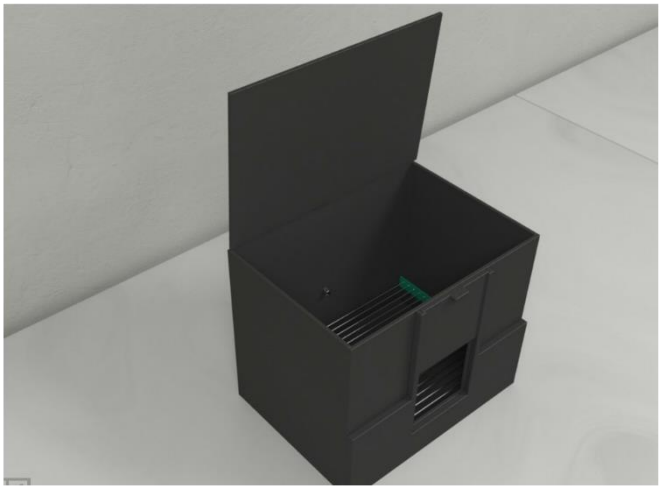
Grey, Black, Clear

Features

•Contextual Plates
•Shock

Available

Mouse **Rat**



Vogel's Test

The Vogel test is a classic protocol where rodent subjects are water deprived and then placed in the an apparatus while simultaneously exposed to punishment in the shape of a mild shock whenever fluid is retrieved. It is used for measurement of the ability of drugs to alter the drinking behavior in these water deprived rodents. The MazeEngineers Vogel's test apparatus includes the following key features to help your experiments succeed:

• Lickometer with ability to sense licks and log in Conductor.
• Configurable Shock plate
• Easy to clean and remove fecal & urine chamber.
• The Conductor Software records experiments up to 10 hours long. During this time many parameters can be controlled as discussed in the Features section.
• Interchangable colors and plates for video grading

Suggested Color

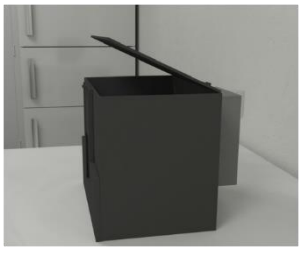
Black, Grey

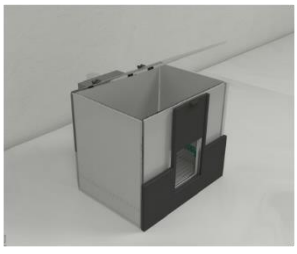
Features

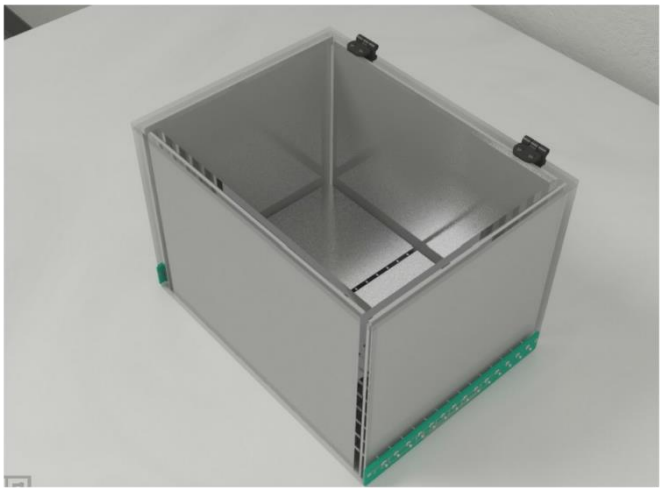
• Sturdy Chamber
• Lick
• Shock
• Easy Automation

Available

Mouse **Rat**







Aron's Test

Aron's test is an elegant yet simple and economical solution for testing the effect of anxiolytic drugs in mice and rats. Mild electric foot shocks cause punishment while rodents attempt to explore their novel environment. The MazeEngineers 4 Plate test allows for shock at highly discriminatory doses in 4 separate quadrants at your control. Data is collected with our Conductor Software. Your order comes with an easy to open lid. Interchangable walls can be included in your order.
A simple modification of plates can be made to interchange shock with heat plates. Please inquire for more details.

Suggested Color

Clear

Available

Mouse **Rat**

Active/Passive Avoidance Shuttle Box

The MazeEngineers Shuttle Box is a flexible system for both active and passive avoidance experiments. It comes with two independent grid floors that allow for flexible adverse stimuli. A top loading door allows an easy access inside the box. The cage contains a sound generator and a visual stimulus (light) that functions separately for each compartment.
Rodents in the cage are detected by two separate weight detection mechanisms that high sensitivity and specificity. Data can be combined with the Noldus Ethovision software and integrated with Neuralynx using the Conductor Software.

Suggested Color

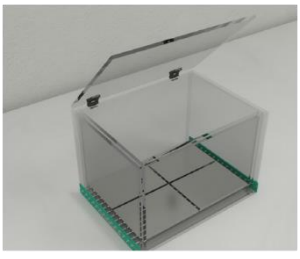
Black

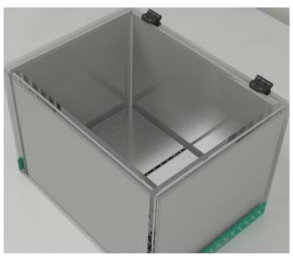
Features

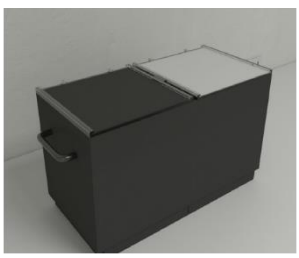
- Sound
- Weight Detection
- Contextual Plates
- Light Cues
- Shock

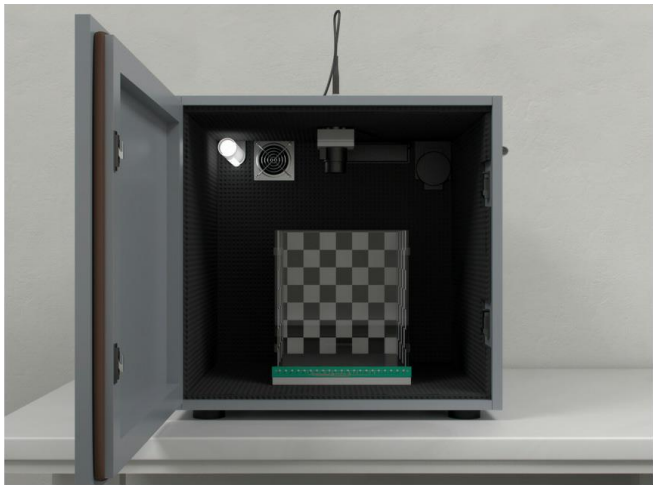
Available

Mouse **Rat**









Fear Conditioning

The MazeEngineers Fear Conditioning Chamber comes with an isolation chamber with speakers, dB detector, dual IR/visible light generation, Contexual cage with easy to replace acrylic plates, and smooth shock delivery. Key features include:
•Insert customized sound files for predator and maternal experiments
•Multiple shock delivery methods
•Integration with Neurolynx, Ethovision, Email & SMS
The Fear Conditioning Chamber is a behavioral task widely used in neuroscience to assess associative learning. We have carefully designed our chamber to allow new scientific avenues and to allow easy data collection and experimental execution.

Suggested Color

Grey, White, Black, Chessboard, Vertical Stripes

Features

•Sound
•Isolation Chamber
•Contextual Plates
•Light Cues
•Shock Grid

Available

Mouse **Rat**

Operant LED Light

Stimulus and signaling
Signal that is usually used above the receptacle for food or liquid to display reward, or used to signal availability for lever and nose poke.

White Light
Used for house light
IR Version available

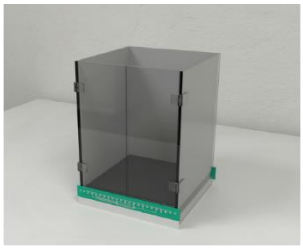
1 Point in the operant builder

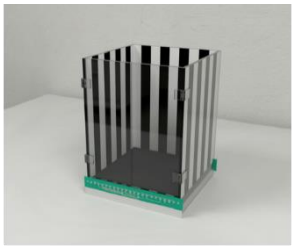
Suggested Color

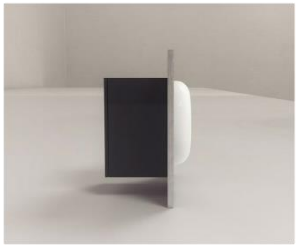
White

Available

Mouse **Rat**







Operant Wide Frame

Frame for operant chambers. Available for mice and rats. Provides 8 points in operant builder.

Suggested Color
Clear

Available

Mouse **Rat**

Operant Tall Frame

Frame for Operant Chambers. Tall frame for mice and rats. Provides 6 points in the operant builder.

Suggested Color
Clear

Available

Mouse **Rat**

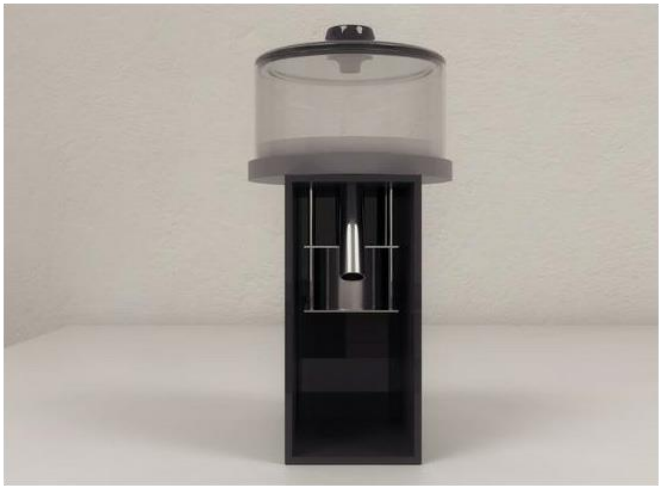
Operant Standard Frame

Frame for operant chambers. Standard 6 slot chamber for mice and rats Provides 6 points in operant builder.

Suggested Color
Clear

Available

Mouse **Rat**



Pellet Dispensor

Reward device for mice and rats with sensitive IR detection. Reward for operant experiments. 1 point in operant builder.

Suggested Color
Black

Available

Mouse **Rat**

Pellet Receptacle (Dual)

Receptacle for food pellets
• Receiving area for food pellets
• To be paired with 2 pellet dispensors

Available for mice and rats
Weight detection available for food pellet

1 point in operant builder

Suggested Color
Metalic silver

Available

Mouse **Rat**

Pellet Receptacle (Single)

Receptacle for food pellets
• Receiving area for food pellets
• To be paired with 1 pellet dispensors

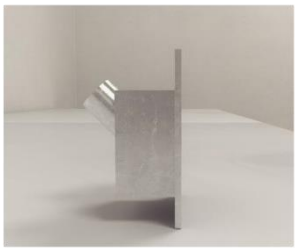
Available for mice and rats
Weight detection available for food pellet

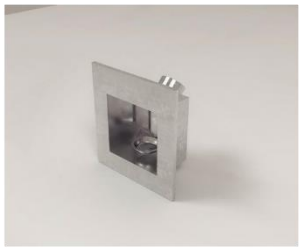
1 point in operant builder

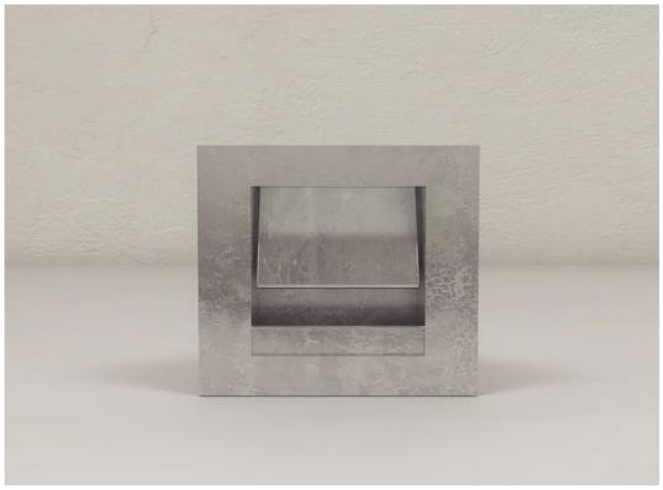
Suggested Color
Metalic silver

Available

Mouse **Rat**







Trough Receptacle

Receptacle for food or fluid
• Receiving area for pellets or fluid
• To be paired with 1 fluid or food dispensor

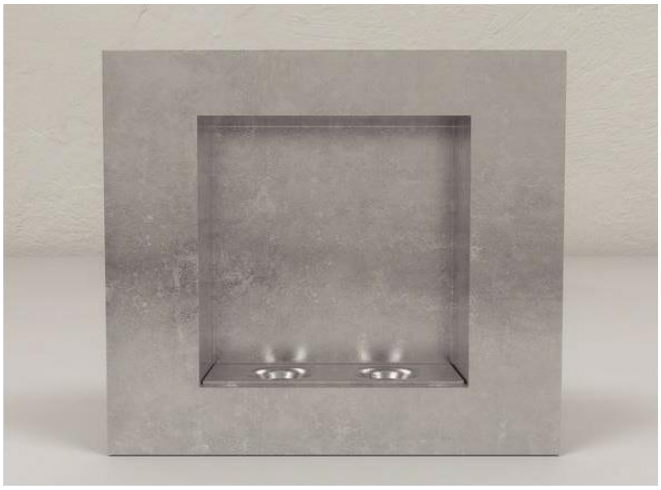
Available for mice and rats
Weight detection available for liquid or food
Vacuum removal of residual fluid available.

1 point in operant builder

Suggested Color
Metalic silver

Available

Mouse **Rat**



Fluid Receptacle (Dual)

Receptacle for fluid
• Receiving area for fluid.
• To be paired with 2 liquid dispensors

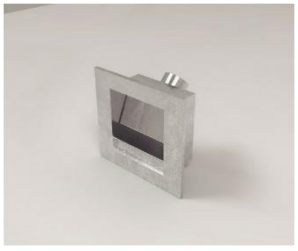
Available for mice and rats
Weight detection available for liquid dispen-
sement
Vacuum removal of residual fluid available.

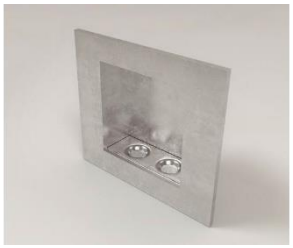
1 point in operant builder

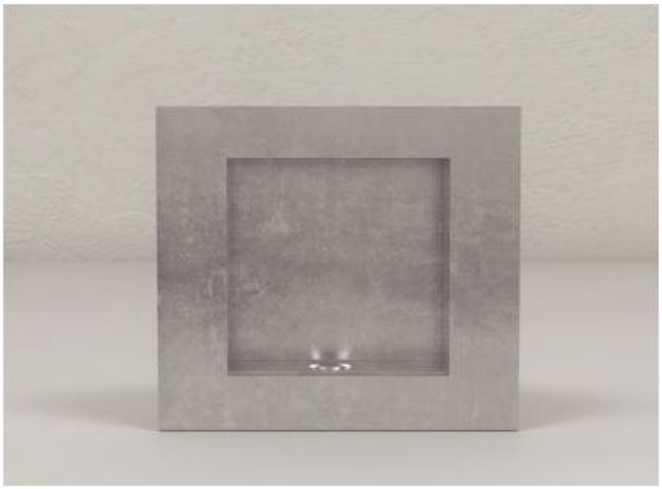
Suggested Color
Metalic silver

Available

Mouse **Rat**







Fluid Receptacle (Single)

Receptacle for fluid
• Receiving area for fluid.
• To be paired with 2 liquid dispensors

Available for mice and rats
Weight detection available for liquid dispensement
Vacuum removal of residual fluid available.

1 slot in operant builder

Suggested Color
Metalic silver

Available

Mouse **Rat**

Omnidirectional Levert

Signal for operant experiments.

• Input device for mice and rats in experiments.
• Uses roof spacing.

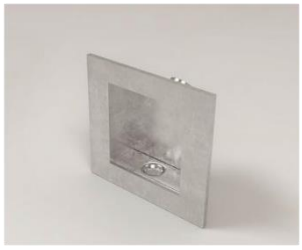
Available for mice and rats
Adjustable force

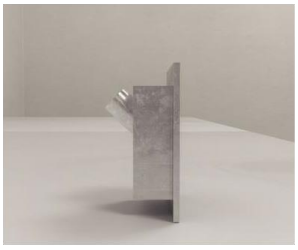
1 point in operant builder

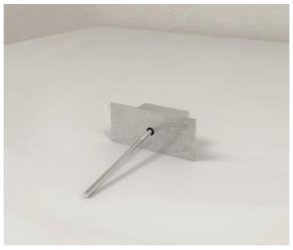
Suggested Color
Metalic silver

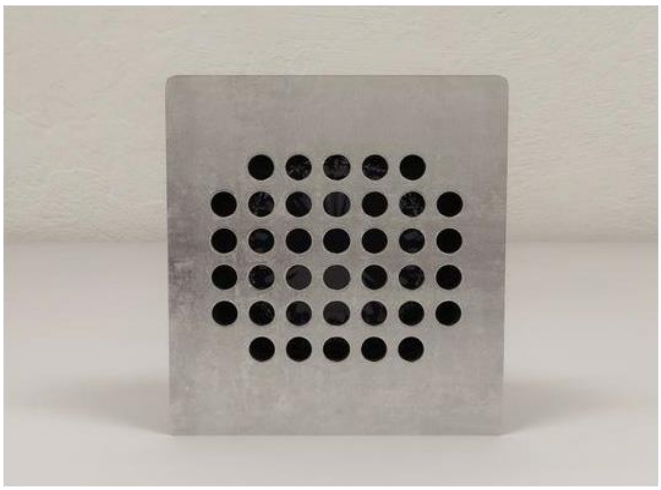
Available

Mouse **Rat**









Operant Speaker

Signal for operant experiments.
• Signaling for mice and rats in experiments.
• Maternal calls, predator, or tone signaling all possible.

Available for mice and rats
Custom audio file input controlled with Conductor Software
Paired with or without audio detection(Hz)

1 point in operant builder

Suggested Color
Metalic silver

Available

Mouse **Rat**

Liquid Dispensort

Reward for operant experiments
Reward device for mice and rats with sensitive IR detection.

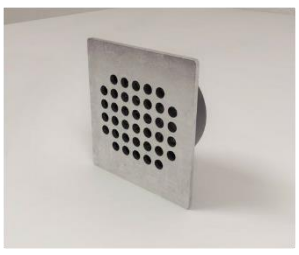
Available for mice and rats

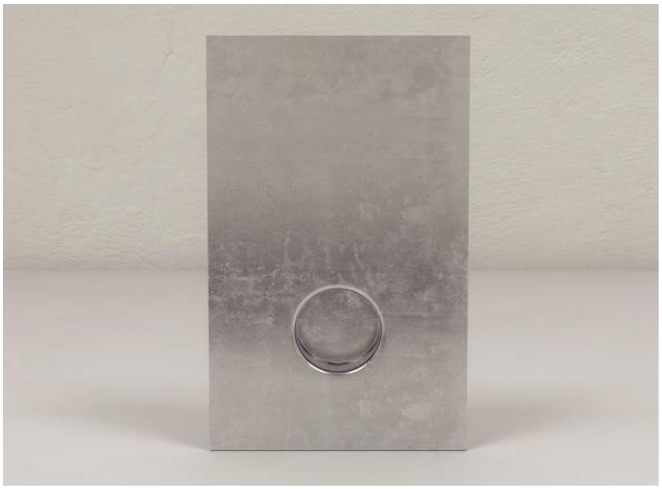
1 point in operant builder

Suggested Color
Metalic silver

Available

Mouse **Rat**





Nose Poke

Sensitive input device
Input device using a nose poke for mice and rats with sensitive IR detection.

Available for mice and rats

Multiple lighting options available

Suggested Color
Metalic silver

Available

Color: None

Mouse **Rat**

Color: Single

Mouse **Rat**

Color: Single

Mouse **Rat**

Response Wheel

Sensitive input device
Input device using a response wheel for mice and rats.

Available for mice and rats

1 point in operant builder

Suggested Color
Metalic silver

Available

Mouse **Rat**

Lever

Sensitive input device
Input device using a lever. Retractable and non retractable versions available.

Retractable model
Non retractable Model
Available for mice and rats

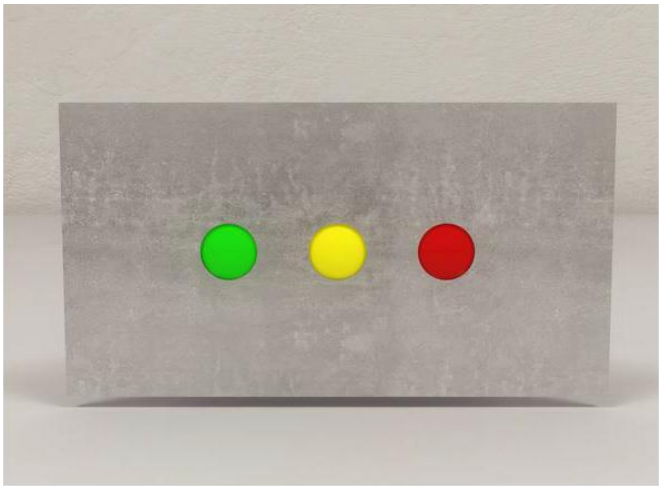
Suggested Color
Metalic silver

Available
Retraction: Yes

Mouse **Rat**

Retraction: No

Mouse **Rat**



LED Colored Lights

Stimulus and signaling
Signal that is usually used above the receptacle for food or liquid to display reward, or used to signal availability for lever and nose poke.

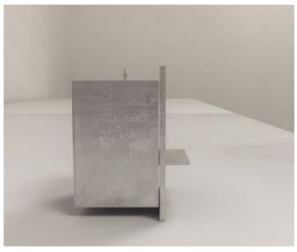
Red, Yellow, Green Light
Other bulbs available upon request

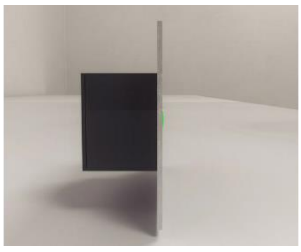
1 Point in the operant builder

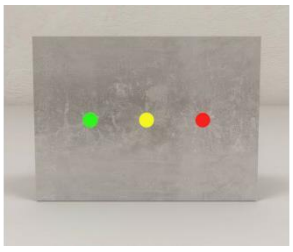
Suggested Color
Red, Yellow, Green

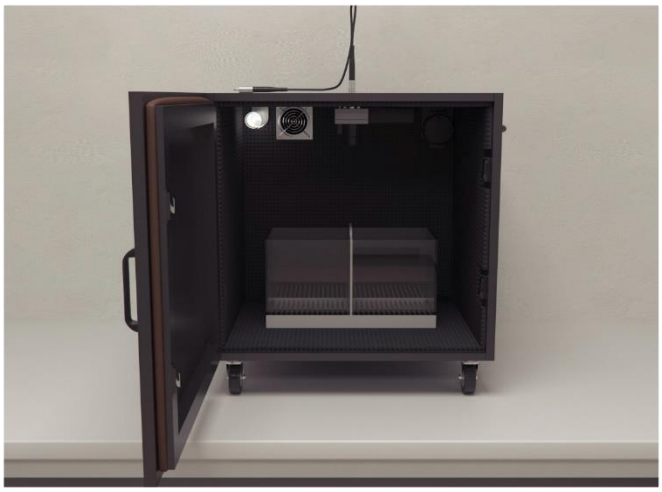
Available

Mouse **Rat**









Empathy Assay

The empathy assay was first described in the literature by Jeon et al (2011) and is an excellent tool to interrogate observational fear. The MazeEngineers apparatus comes with two key components: A double chambered acrylic chamber with two foot shock controlled grids, each of which can be controlled independently with our free Conductor Software. This apparatus is then placed inside of a standard, basic isolation chamber. Upgrades in this chamber to include sound and light cues can be done. Please inquire for more information.

Suggested Color

Clear

Available

Mouse **Rat**

OroFacial Pain Assessment Device (OPAD)

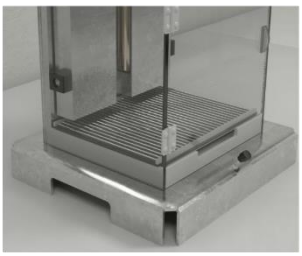
The Orofacial Pain Assessment Device (OPAD) was developed by Neubert and colleagues (2005) as an operant system of pain assessment that relies on voluntary behavior. Popular pain batteries offer a unidimensional assessment of pain. Pain responses involve executive functioning and other experiences, thus, relying simply on reflex and innate responses do not provide the complete picture. Further, pain management drugs can have sedative effects and may also affect psychomotor abilities in addition to providing pain relief. Therefore, a conflict-based paradigm proves to be a more sensitive method that enables in-depth analysis of pain.
The OPAD system is composed of Peltier-based thermode, and metal wires that allow assessment of thermal and mechanical pain sensitivity. The starved animal is placed in the operant chamber where it can access the food reward only when it contacts the thermal and mechanical stimuli. Essentially, the subject is tasked with choosing to tolerate the pain to gain the reward. Unlike traditional pain assays that are typically based on reflex behaviors, the OPAD allows the subject to choose its own pain threshold in order to attain the reward. This reward-conflict paradigm offers better face, content, and predictive validity. Additionally, the OPAD also encompasses psychological and affective dimensions of pain as observed in humans.

Other pain assessment devices include the Electric von Frey Filament, the Tail Flick Test, and the Hargreaves Plantar Test.

Suggested Color

Clear

Available



Tail Flick Test

Tail Flick test was first described by D'Amour and Smith in the year 1941. In their experiment, D'Amour and Smith investigated the analgesic effects of different substances and even cobra venom on pain response of rats. The test is similar to the Hargreaves Plantar test, but instead of directing heat to the center of the rodent's hind paw, heat stimulus is applied to the tail of the rodent. The Tail Flick test results may be dependent on the strains and species used, and their ability to acclimatize to being restrained.

The Tail Flick test has two variants; one variant uses dipping the tail into water that is maintained at a predetermined temperature, while the second variation uses the application of radiant heat stimulus to a part of the tail. For both variations, it is important that the subject is accustomed to handling. Assays similar to the Tail Flick test include the Hargreaves Plantar test, the Hot-Cold Plate test, and the Thermal Gradient test.

Suggested Color

White

Available

Electric Von Frey

The von Frey monofilament was designed by Maximilian von Frey as an esthesiometer in 1896. These filaments have been widely used in the assessment of mechanical nociception. The process of assessment of punctuating mechanical allodynia and hyperalgesia involves the application of von Frey filaments of forces ranging anywhere from 0.08 mN to 2940 mN and observing the withdrawal thresholds. The assay can be performed manually or by using an electric von Frey.

The most commonly used method is the up-down method, wherein the tips are smoothly applied perpendicularly to the skin of the plantar surface of the subject until they buckle. However, the technique tends to be time-consuming. The electronic von Frey (EvF) is used to overcome the disadvantages of the conventional von Frey assay. The former has many advantages over the manual von Frey assay, primarily, the use of a single filament to apply varying levels of pressure. Further, unlike other tests such as the Randall-Selitto test, the von Frey monofilament assay does not require restraining the subject. This approach minimizes handling and restraining anxiety which could otherwise potentially influence the performance of the subject.

Suggested Color

White

Available

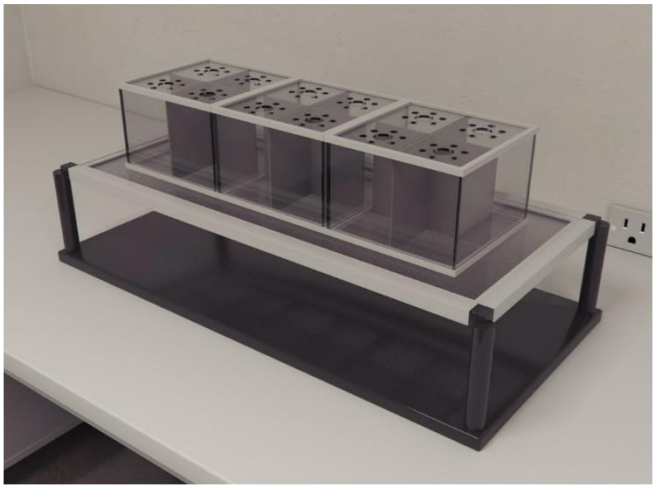
Hot Plate

The hot plate test is a gold standard thermal pain test in rodents and serves as a useful screening tool for interventions of analgesia. Placing a mouse or rat into a chamber with a heated floor with surrounding clear acrylic walls. Two key behaviors are measured: paw licking and jumping.

Suggested Color

White and Clear

Available



Plantar Test Hargreave's Apparatus

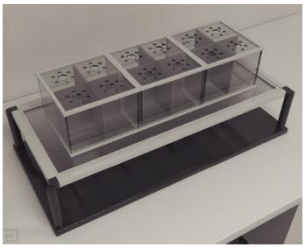
Thermal withdrawal latency was first described by Hargreaves et al (1988). It is a widely used test for thermal stimuli response. In this procedure, a rodent hindpaw is exposed to a beam of radiant heat through a transparent glass surface using the plantar analgesia meter. The latency to withdrawal to the heat stimulus is recorded as the time for paw withdrawal in both injured and uninjured hindpaws.

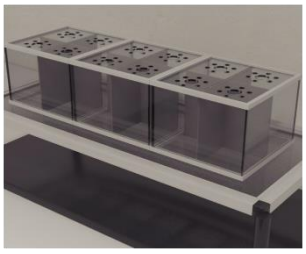
The infrared (I.R.) heat intensity of the plantar test instrument can be adjusted in increments as per specifications below, usually set at average paw withdrawal latency to approx 10 seconds in rats.

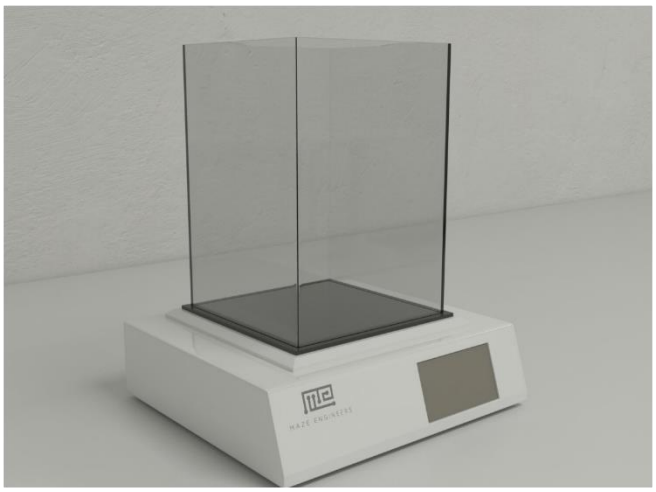
Suggested Color

Black and Clear

Available







Hot/Cold Plate

The hot plate test is a gold standard thermal pain test in rodents and serves as a useful screening tool for interventions of analgesia. Placing a mouse or rat into a chamber with a heated floor with surrounding clear acrylic walls. Two key behaviors are measured: paw licking and jumping.

Suggested Color

White and Clear

Available

Thermal Gradient

The Thermal Assay Test is a widely used behavioral task used for the study of nociception, the neural process of encoding actual or potential tissue damaging stimuli.

When given the choice to stay in areas with different temperatures, animals will show preference for the zone with the most comfortable temperature, as determined by their thermal sensitivity, influenced by their nociceptive state. By measuring the time spent in each temperature zone, differences in thermal sensitivity can be assessed and be used as an index of nociception.

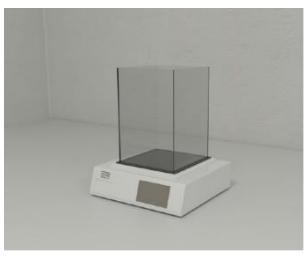
Key Features include:

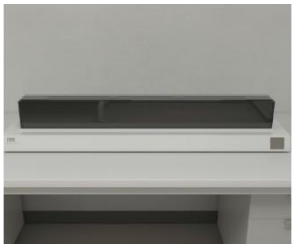
Eliminate run time data entry mistakes by defining entire study in advance
Programmable parameters include.

Suggested Color

Black and White

Available





Olfactory System

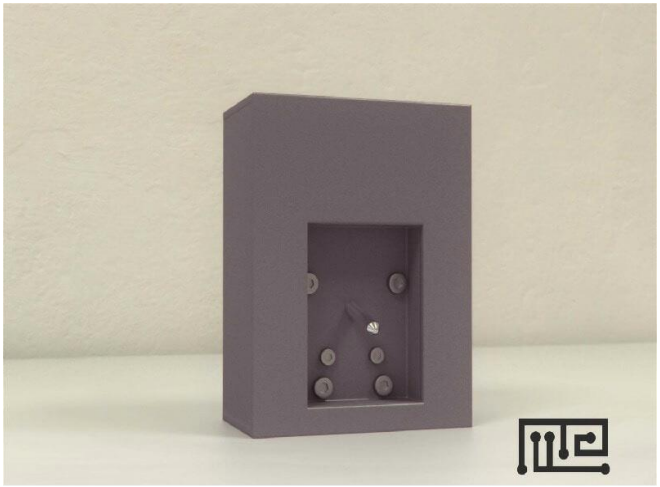
MazeEngineers offers an olfaction system that can be integrated into automated mazes, operant conditioning, and other systems. Please inquire for more details and a quote of your customized apparatus.

The ME olfactory stimuli delivery system converts odor liquid to vapor form and delivers the scents to integrated into operant conditioning units such as nose-poke holes or arm/chamber areas of mazes.

Suggested Color

Clear

Available



Lickometers

Maze Engineers lickmeters are a precision engineered apparatus with customization in mind. When you order, we create customized enclosures around the lickmeters including color & size. The default lickometer is adjustable in height and location so that you can change between trial runs. We can put these lickometers into any sort of other maze, thus creating entirely unique environmental enrichment chambers. You can create extraordinarily unique experiments with this capability, so let your creativity fly! Can be combined with any maze for brand new activity protocols and unique habitat enclosures. Many colors, sizes, and even multiple configurations of lickometers available.

Suggested Color

Any color available

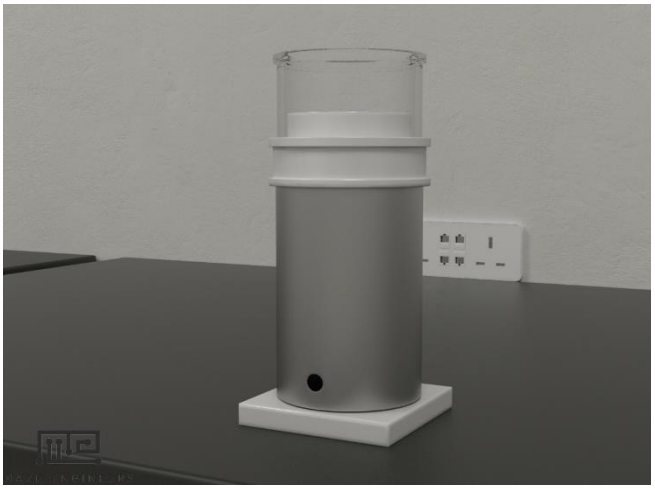
Modifications Available

•Adjustable Height

Available

Adjustable Height:

Fiber Optic Feedback Sensor



Pellet Dispenser

The Maze Engineers automated pellet dispenser utilizes precise optical detection to measure licks with a pellet reward. Adjustable port can move up, down, left and right and locked into place at any point. Acrylic boxes, containers, and lids are built customized to your needs when you order.
Can be combined with any maze for brand new activity protocols and unique habitat enclosures. Many colors, sizes, and even multiple configurations of feeders available.

Suggested Color

Any color available

Modifications Available

•Adjustable Height

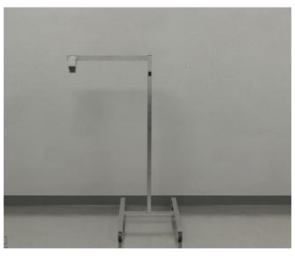
Available

Gantry

Gantries for multiple uses. Please inquire for more details, as we will need to ensure that the specifications meet your desired camera holder.

Suggested Color

Grey



Casters

Type A:
•Maximizes Weight Bearing
•Allows elevation for draining
•Ideal for Morris Water Maze

Type B:
•Solid Flooring with handle
•Maximizes storage and movement
•Ideal for Automated Mazes

Suggested Color
Grey

Available

Type A:
Mouse **Rat**

Type B:
Mouse **Rat**

Maze Backlight

MazeEngineers offers generic backlighting display cases for use with smaller mazes such as the open field, novel object recognition, and Y/T mazes. The sizing can be customized upon request for larger mazes as well. Please inquire for more information.

Suggested Color
Brown

Morris Water Maze Pretraining Chamber

Included in your order is an aluminum allow pretraining chamber that limits the mouse or rat to swim in the morris water maze. The pretraining chamber allows the researcher to gently introduce the rodent into a liquid/water/milk apparatus and learn to minimize anxiety and fear related responses, maximizing learning responses during trials. MazeEngineers offers multiple configurations for the pretraining chamber, most economically the 4 sided chamber fitting the 4 or 5 foot morris water maze.

Suggested Color

Metalic silver

Available

4 sided **5 sided**

6 sided

Morris Water Maze Round Arena

Included in your order is an aluminum allow pretraining chamber that limits the mouse or rat to swim in the morris water maze. The pretraining chamber allows the researcher to gently introduce the rodent into a liquid/water/milk apparatus and learn to minimize anxiety and fear related responses, maximizing learning responses during trials. MazeEngineers offers multiple configurations for the pretraining chamber, most economically the 4 sided chamber fitting the 4 or 5 foot morris water maze.

Suggested Color

Grey

Available

Mixed Reality Radial Arm Maze Add On

In Collaboration with Simian Labs, MazeEngineers is proud to offer a virtual reality Morris Water maze for researchers.

The real-world element of the mixed reality Elevated Plus Maze includes the wooden EPM. The maze is constructed using wood. The arms have a width of 30 cm and a height of 20 cm having a length of 175 cm. The arms are perpendicular to the central joining point. Overall the maze covered 350 x 350 cm area of the 550 x 550 cm room.

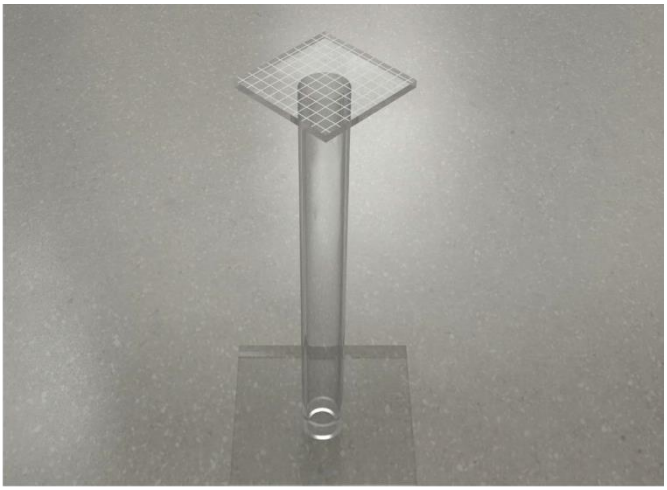
The wooden maze enhances the experience of the virtual Elevated Plus Maze, thus, allowing a more genuine response from the participants.

Suggested Color

Black

Available

Human



Adjustable Platform

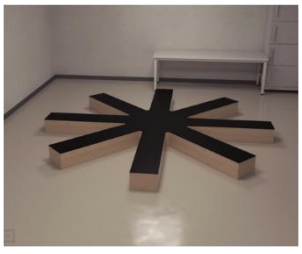
The MazeEngineers Morris Water Maze adjustable platform is designed for the perfect Morris Water Maze experiment. Clear acrylic means the mouse uses spatial cues, not intramazal cues. Adjustable height allows just the right depth in the water. Etched acrylic allows for easy grappling to the surface. Sturdy base lets you ensure that the platform will not move. This is the platform you need to make sure your experiment runs smoothly. Made for mice and rats.

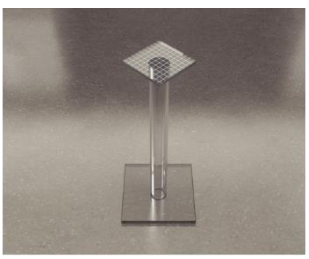
Suggested Color

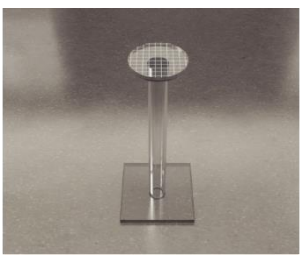
Clear

Available

Mouse **Rat**







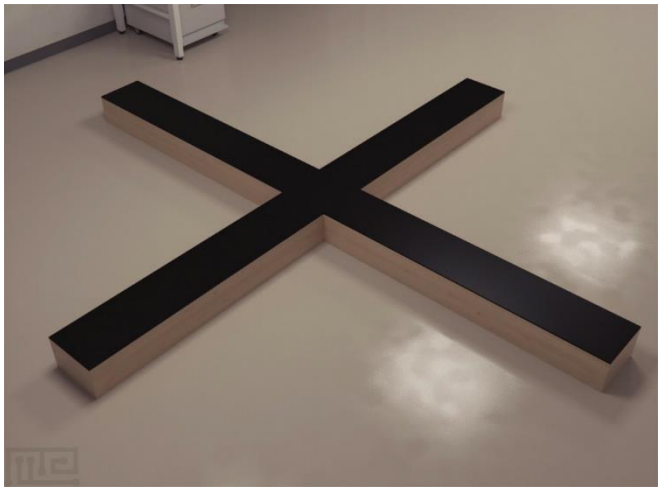
Sound Attenuating Chamber

Isolation chamber available for various conditioning related experimentation. Available with inserts including the following:

- Dual visible and IR light bulb.
- Sound (Hz) Detector
- Speaker Frequency: (100-40,000 Hz)
- Speaker Intensity: 1-150 dB
- Dimensions 50 cm(w) x 40 cm(d) x 50cm (h)

Suggested Color

Black



Mixed Reality Elevated Plus Add On

In Collaboration with Simian Labs, MazeEngineers is proud to offer a virtual reality Morris Water maze for researchers. This is open to select users only . Inquire for more details.

The real-world element of the mixed reality Elevated Plus Maze includes the wooden EPM. The maze is constructed using wood. The arms have a width of 30 cm and a height of 20 cm having a length of 175 cm. The arms are perpendicular to the central joining point. Overall the maze covered 350 x 350 cm area of the 550 x 550 cm room.

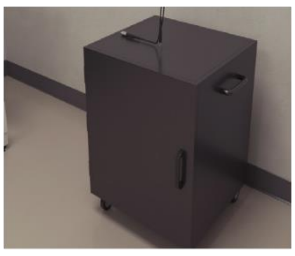
The wooden maze enhances the experience of the virtual Elevated Plus Maze, thus, allowing a more genuine response from the participants.

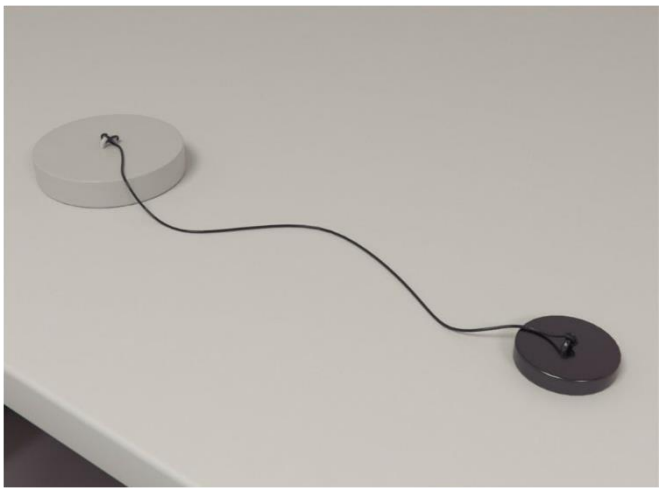
Suggested Color

Black

Available

Human





Morris Water Maze Float Platform

Included in your order is both a floating platform and a rigid platform with identical appearances for maximum evaluation of learning in the floating task.
The floating platform comes with a tether and counter weight so that it stays stationary in the tank. It is neutrally buoyant so that it will sink whenever an animal tries to climb aboard. The fixed rigid platform, however, does not sink upon weight bearing.
Multiple colors available. Please let us know your experimental age/strain weight so we can ensure sink upon weight placement.

Suggested Color

Black, Blue, White, Grey, Red, Clear, Yellow

Available

Mouse **Rat**

Morris Water Maze Heater

The titanium body means suitability for use in all Morris Water Maze fluids including milk, powdered water, and paints. The device has outstanding resistance to fatigue & erosion. All units come fully equipped with digital control panel that is installed exterior to the Morris Water Maze.
• 1.8kw (1800 Watts), 16A
• 120 Volts AC w/15ft Power Cord with 20 AMP NEMA Plug
• Titanium construction (Suitable for Multiple Fluids)
• Digital Temperature Display & Control
• High Limiting Safety Thermostat
• Control thermostat 0ºF to 90ºF with 1ºF differential
• Approximate dimensions: 19' L x 2-3/4' diameter
• Temperature sensor wire: 15ft
• Power Cord: 15ft
• Note: Heater should be fully submerged at all times if turned on.

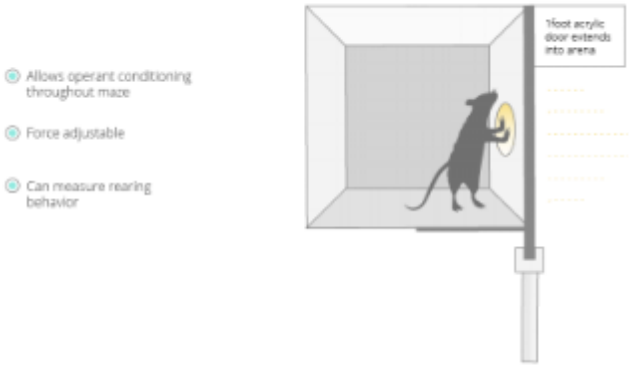
Available

120 V

Floor Insert

Small **Medium** **Large**

Labyrinth



Touch Sensitive

•The TILT feature allows all acrylic or interchangeable inserts to be touch sensitive, creating touchscreen like capabilities throughout the entire maze.
•This allows for operant conditioning mazes with simple exchangeable inserts

Novel Features

- Doors vs Pseudodoors

Doors create openings that allow a mouse to pass when they are approached. Pseudodoors rise to prevent a mouse from passing when they are approached.

- Walls vs Pseudowalls

Walls are in the upright position and stay in that position when approached. Pseudowalls are in the upright position until a specified action turns it into another object.

- Hold

When you want to reconfigure, you can put the maze on “hold” which finds and surrounds the mouse with walls so you are free to do another action.

- Move sequence

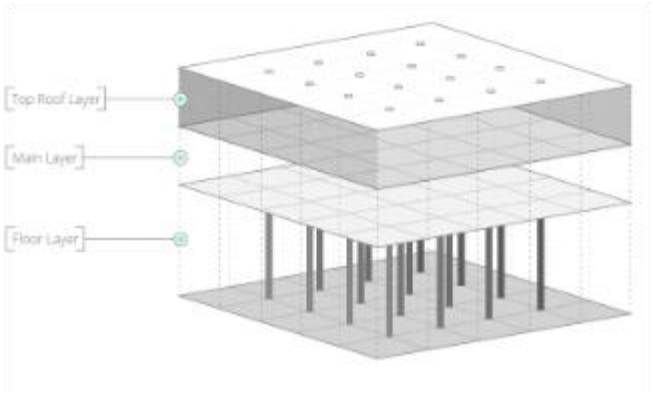
Sequences allow quick turnaround between trials.

- Conditional mazes

Mazes that reconfigure if the mouse does not succeed at a certain time interval or task. Mazes start on the hardest level and get progressively easier until the mouse succeeds.

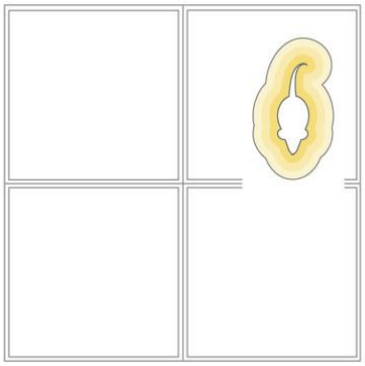
- Obstacle

Walls can become obstacles of any height.



Modal

•The Labyrinth core is composed of adjustable inserts
•3 Layers: Top (Roof) Layer, Main (Arena) Layer, and Bottom (Mechanical) layer.
•Inserts allow modifications of the core into an automated version of over 20 modern behavioral apparatuses.
•This same machinery allows for entirely new types of automated tests, which is the true strength of the Labyrinth.



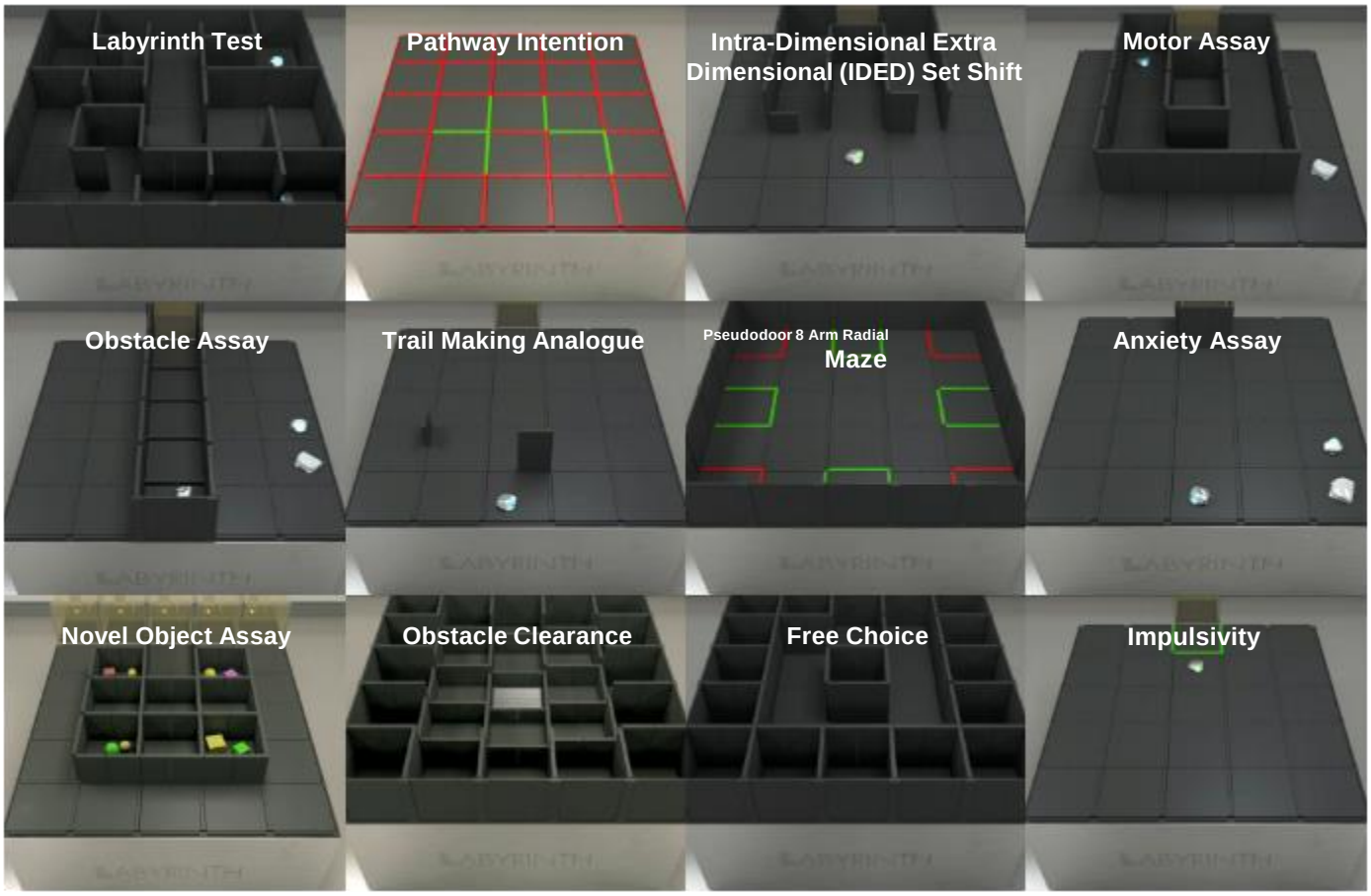
Active Safety

The Labyrinth continuously scans the interior arena to track animals, providing real-time feedback to help avoid injury to animals even for long term living. The Labyrinth is designed to minimize injury to rodents during protocols.

Variations

De Novo Methodologies

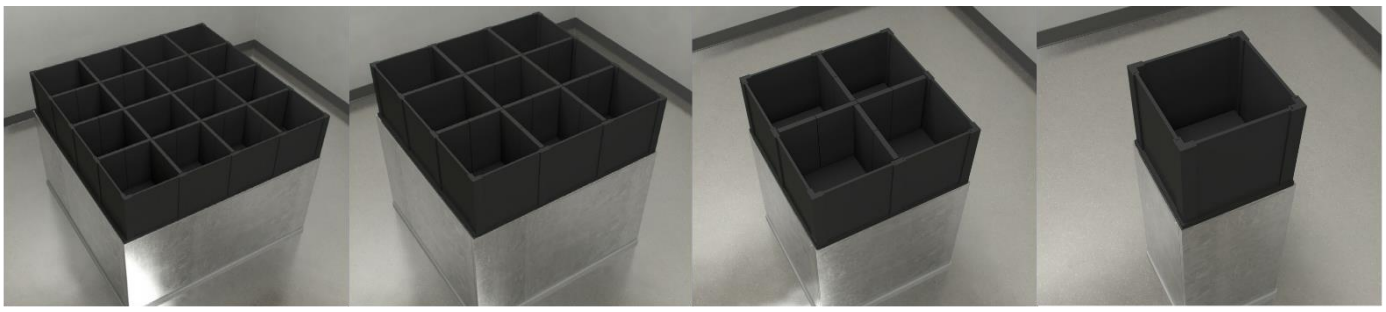
Establish novel preclinical science standards



Sizing for Every Behavior Core

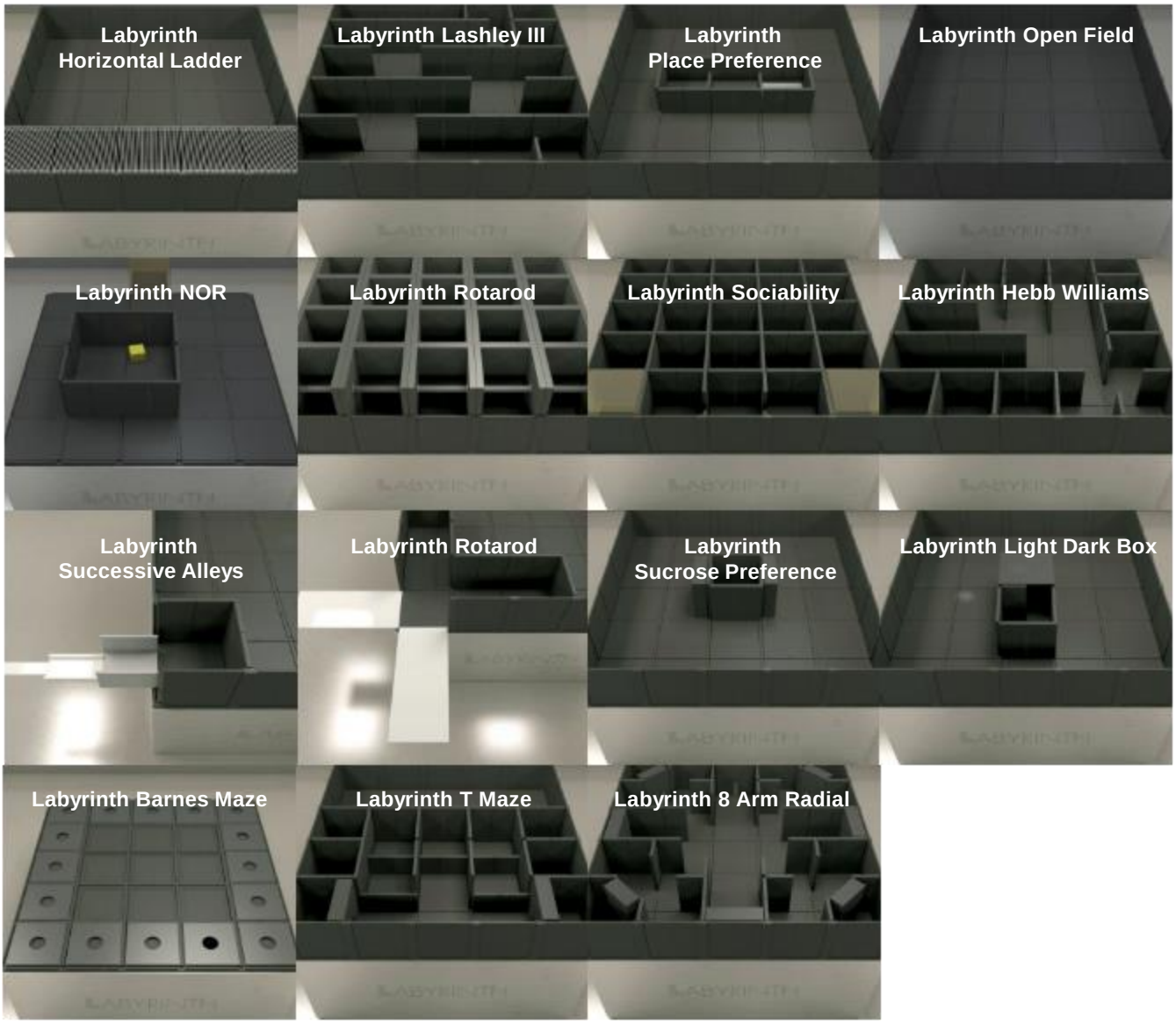
Labyrinth Labyrinth Labyrinth Labyrinth

4 3 2 1



Replicate

Established methodologies. Labyrinth is a Behavior Core in one machine



Specifications

Mouse
2.04 m2
/ Total Footprint
Maximum Height: 92 cm
Minimum Height: 64 cm
Width: 143 cm
Length: 143 cm

Mouse with Crete
4.12 m2
/ Total Footprint
Maximum Height: 122 cm
Minimum Height: 64 cm
Width: 203 cm
Length: 203 cm

Rat
2.82 m2
/ Total Footprint
Maximum Height: 127 cm
Minimum Height: 92 cm
Width: 168 cm
Length: 168 cm

Rat with Crete
5.29 m2
/ Total Footprint
Maximum Height: 163 cm
Minimum Height: 92 cm
Width: 230 cm
Length: 230 cm

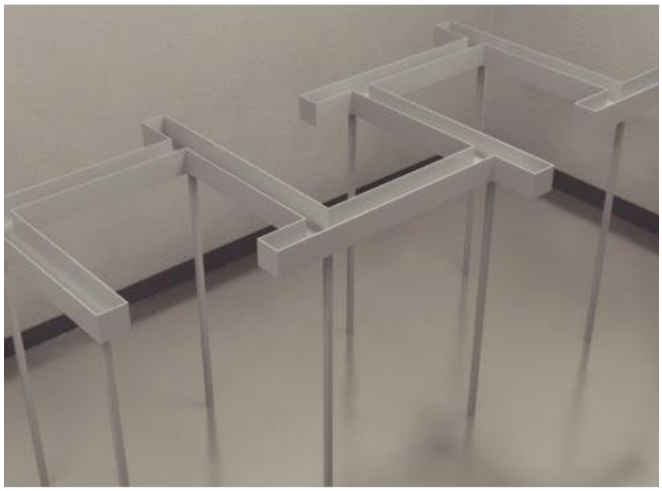
mazeengineers.com/labyrinth

Cincinnati Water Maze

Cincinnati Water Maze (CWM) is a labyrinthine maze used to study egocentric navigation, learning, and memory. Egocentric navigation is one of the two types of local navigation described as the ability to locate places using proximal or internal cues close to the organism. The other type of navigation is called allocentric or spatial navigation that uses distal cues like visual or auditory, to locate places. Egocentric navigation involves route-based integration where an organism follows a specific set route and path integration where an organism takes a more direct route back to the starting position after exploring different locations. Egocentric navigation of particular route overtime eventually leads to the formation of an automated habit that is stored in the prefrontal cortex as a long-term memory of skilled behavior. There is an overlap between the neural networks in the brain that are involved in mediating egocentric and allocentric navigation, so a lesion or a treatment targeted to one type can cause changes in the other type of navigation.
In water mazes, water itself acts as a motivator for the subject to escape which is an advantage when compared to appetitive tasks in which motivation can differ between subjects. The reason for the difference in motivation between subjects is because, in appetitive tasks, condition or treatment under study can cause changes in body mass or produce motor deficits causing problems with palatability of the reinforcer. Water continues to act as a motivator from the first to the last trial as opposed to in appetitive tasks where motivation can decline as more rewards are gained. In most of the water maze tasks, training trials are given in a straight swim channel just to introduce the idea that escape is possible before testing in the maze. Without such trials, subjects can feel frustrated and are likely to give up searching as seen in Forced Swim Test (FST). In comparison to appetitive tasks, water maze tasks have few trail days with few limited-time trials per day as the subjects do not show off-task behaviors seen in appetitive tasks like sniffing, grooming, etc.
There are many water maze tasks for testing allocentric navigation. One of them is Morris Water Maze (MWM) developed by Morris et al., where a hidden platform submerged in a pool of water at a specific position needs to be reached by the subject during the test from different start locations. Another test used is the Radial-arm Maze (RAM) where either all the arms are baited, or some of them are baited to test spatial navigation and memory. RAM is an appetitive task that uses positive reinforcement and relies on food deprivation. A modified swimming version of RAM called Radial-arm Water Maze (RWM) was developed that uses negative reinforcement. There are a lot of different versions and protocols used for both RAM and RWM.
Cincinnati Water Maze (CWM) is one of the most compelling tests used to study egocentric learning and memory when conducted in darkness to avoid distal cues. In comparison, land-based mazes can also be used with blindfolds to study egocentric learning and memory which is not possible with water mazes

Suggested Color

White, Black, Grey, Brown

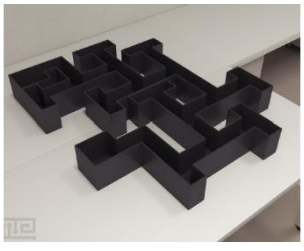


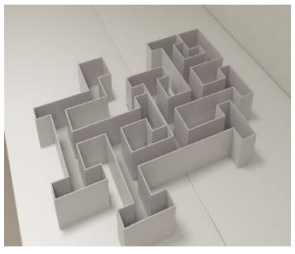
Double Alternation Spatial Maze

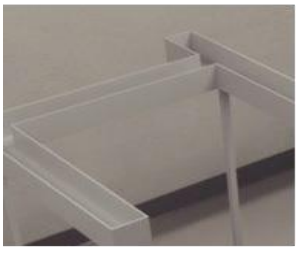
The maze was of the elevated type. Each unit was 35.5 inches long. Of this distance, 10 inches were cul-de-sac and 24 inches were true pathway. In the experiments to be described in this classic paper by Walter S Hunter (1929), Dr. Hunter described the sensory control of behavior in the maze by controlling the stimuli presented to the animal. All of the mazes were constructed so that the distances between turns were exactly equal and consequently would yield equal proprioceptive stimuli. All turns were right angle turns. As a result, all proprioceptive stimuli from right turns should be alike and all stimuli resulting from left turns should be alike. Furthermore, the pathways were carefully machined in order to eliminate cutaneous differences The rats were carried one at a time from the living room to the
experimental room. One trial daily was given. No food was placed
on the maze. When the rat reached the end of the maze, he was
lifted to a chair six feet away where he ate his ration of bread.

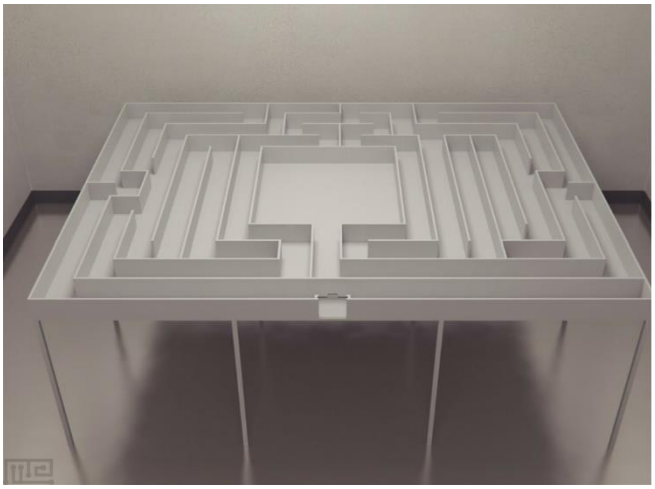
Suggested Color

Grey









Hampton Court Maze

The dimensions are 6 feet x 8 feet constructed of modern acrylic (the classical version was made of wood). All the rest: top, sides, and partitions between galleries were of wire netting. Wall height is 4 inches and alleyway width 4 inches. In the center is a large open space. The original description by Dr. Small was the following: “The aim in these experiments, as indicated above, was to make observations upon the free expression of the animal’s mental processes.”

Suggested Color

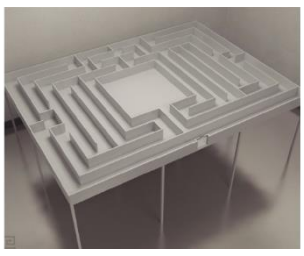
Grey

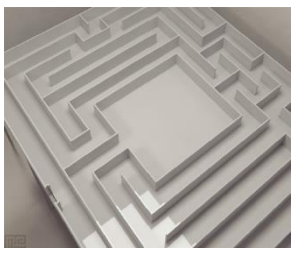
Tridimensional Maze

Walter S Hunter’s (1929) classic double alternation spatial maze, in which the true path lies in two dimensions, can be mastered by rats. Essential cues either came from the environment of the maze or from some neural engram or trace left by the stimuli from each unit of the maze.
In this page we show both the simple alternation and a double alternation tridimensional maze, respectively.
In these mazes, the exits are directly above the entrances. Furthermore, as the rat runs from the entrance to exit, he passes through a cross-section rather than through a longitudinal section of the environment.
If directional stimuli are to function, they must be to some degree vertical.
The tridimensional maze is like the bidimensional maze in that the correct pathway leads constantly into new portions both of the maze and the environment.

Suggested Color

Grey





LaDage, L. D., Cobb Irvin, T. E., Gould, V. A.
Assessing Spatial Learning and Memory in Small Squamate Reptiles

Components:
- Reptile barnes maze - 10 holes
- Heater - 10 holes
- Reptile target box - 10 holes
- Heater -10 holes.

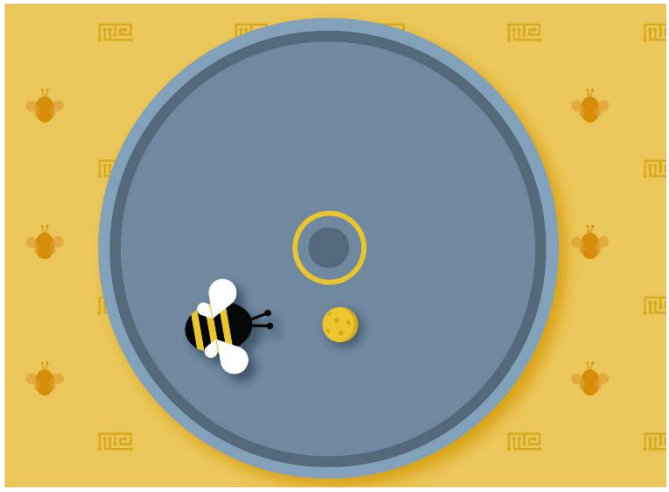
Full Package:
- Barnes maze for the reptile
- Heater (1)
- Reptile box (1)
- Gantry (1)

A la Carte:
- Barnes maze for the reptile
- Heater (1) :
- Reptile box (1) :
- Gantry (1)

Suggested Color

Grey

Full Package **A la carte**



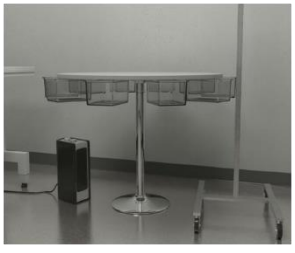
Bumblebees show cognitive flexibility by improving on an observed complex behavior
Loukola, O. J., & Chittka, L. (2017)

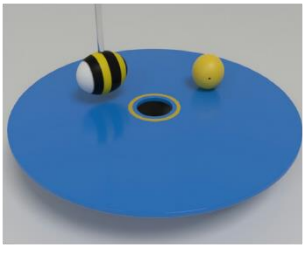
Components #1:
- Home, corridor and test arena
- Test platforms (2)
- Square platform (1)
- Yellow balls

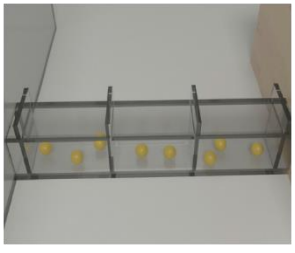
Components #2:
- Plastic model bumblebee (1)
- Full platform (1)
- Full walled platform (1)

Suggested Color

Blue, Clear







Burrowing Tube

Burrowing is a sensitive behavioural assay in which mice or rats spontaneously empty a tube filled with food pellets, gravel or other substances and is a sensitive test to various pathologies including prion diseases and inflammatory conditions,

Acrylic tubing with a 1cm fiberboard backing is included and sealed with a waterproof adhesive. Each tube comes legging on the proximal side for elevation off of the floor

The apparatus comes in sizing for mice and rats. Discount for sets of 4 included.

Colors available: White, Black, Blue non reflective. 3/8 inch thickness

Suggested Color

Grey, Clear, Blue

Available

Mouse Single

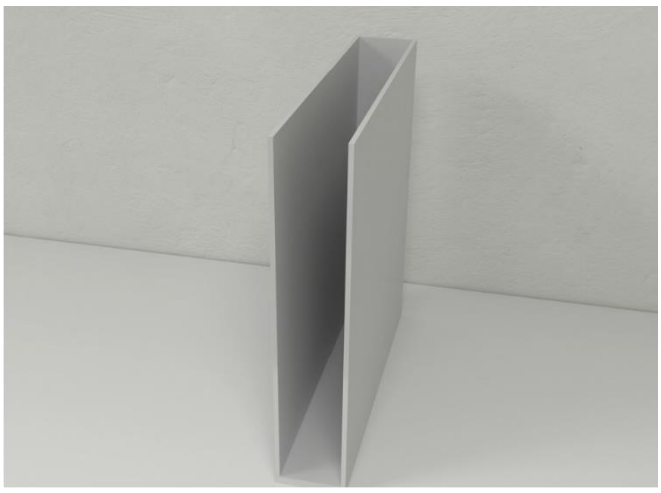
Small Mammal

Rat 4 Pack

Rat Single

Mouse 4 Pack

Small Mammal 4 Pack



Body Turning Test

The body reversal test is a narrow alleyway for turning for mice and rats. A narrow corridor open at one end and closed at the other (three walls), all resting on a removable base.
Removable walls for easy cleaning and storage. Materials for walls and base: opaque acrylic (plexiglass). 3/8 inch thickness.

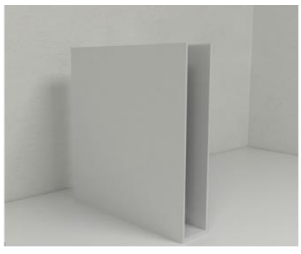
Suggested Color

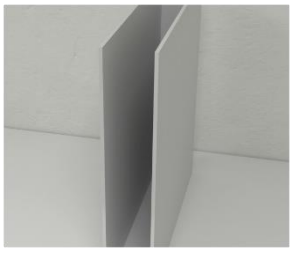
White, Black, Blue non reflective

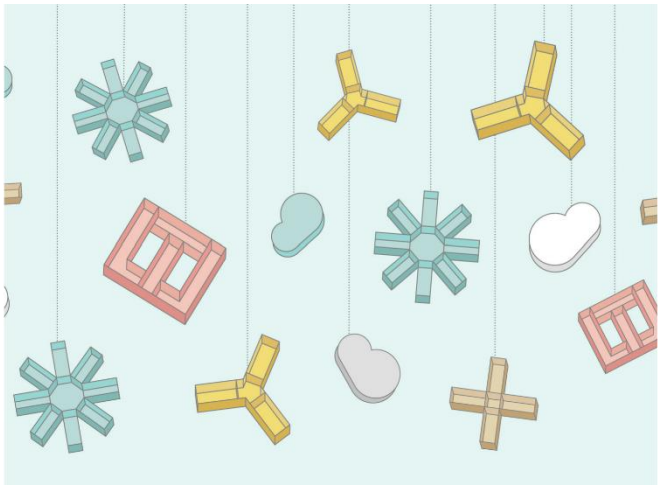
Available

Mouse

Rat







BehaviorCloud

BehaviorCloud allows the collection, analysis, and sharing of research data on a unified cloud platform. As opposed to traditional mediums of collection and analysis that is usually limited to a single device/system, BehaviorCloud allows the opportunity of remote connectivity to the experiments and the data. By using a secured cloud-based system, researchers can collaborate and share data anytime and anywhere without the worry of security. Furthermore, BehaviorCloud is compatible with Android and iOS mobile devices and can be used on multiple devices. Apart from the shareability and connectivity features, the platform allows researchers to take full advantage of cloud data streaming and storage.

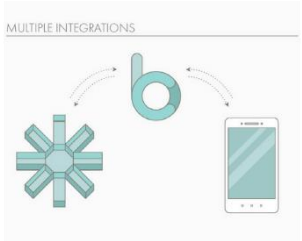
In addition to allowing live streaming of the experiments, BehaviorCloud also offers the option of automated tracking of animal movements. Tracked behaviors of tasks such as Elevated Plus Maze and Open-Field Test can then be used to generate a range of data such as average velocity, number of visits and latencies. For more complex behaviors such as nesting and walking, the platform comes equipped with the augmented manual scoring feature. In many cases, no additional equipment is required in order to use BehaviorCloud and you can get started in minutes.

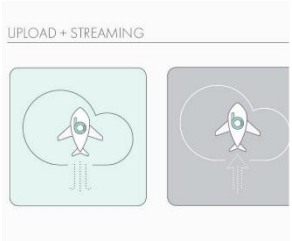
Noldus EthoVision XT

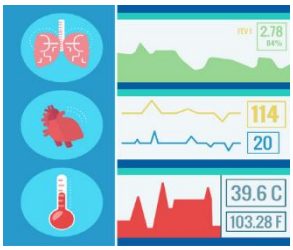
EthoVision® XT is a state-of-the-art video tracking system for automatically recording animal activity and movement. EthoVision XT offers far more than just tracking your animal. Its functionality includes:
-Ability to track the nose, body center, and tail base point of rats and mice.
-Measure the elongation and mobility of their body.
-Synchronize and visualize external data co-acquired with other data acquisition (DAQ) systems.

Modifications Available

- Maze Engineers Integration
- Multiple Arenas Module
- Multiple Arenas Module
- Physiology
- Social Interaction
- Mouse Behavior Recognition
- Rat Behavior Recognition
- Multiple Arenas Module







Drosophila

Drosophila Maze Array

The MazeEngineers Drosophila Array allows for one of a kind Drosophila experiments. Based on the work done by De Bivort et al, the arrays allow for a few key features:
Multiple arrays with a backlight allow for precise video tracking of multiple Drosophila at once
Precision made arrays allow individual drosophila to run unique experiments. Each array is well lit using this configuration
Multiple arrays possible including Y, T, +, and -.
Customized array shapes possible as well.

Suggested Color

Black

4 key layers for the Array

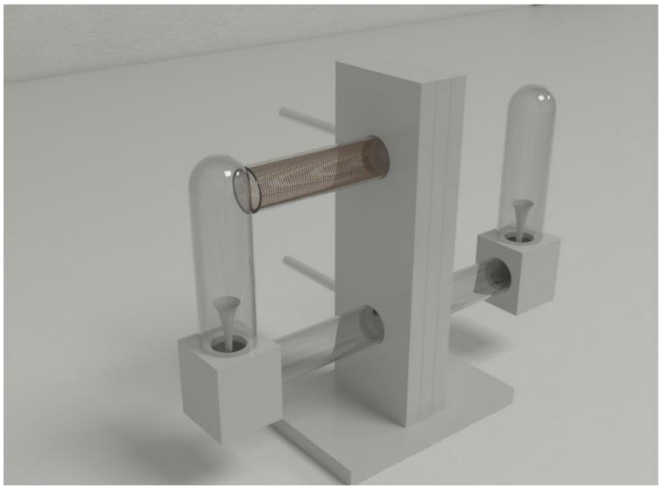
•Layer 1: The bottom, which is translucent with a light backdrop
• Layer 2: The walls of the individual maze. (Height: 1/16 in)
• Layer 3: Infrastructure around the maze to allow for robust strength to each array
• Layer 4: A clear non reflective acrylic lid.

Available

25 Units:

T **Y**

+ **-**

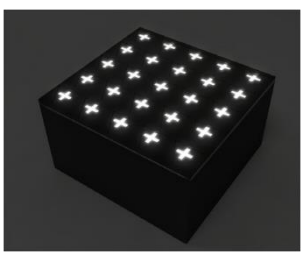


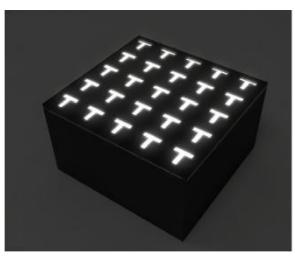
Drosophila Olfactory Operant Conditioning

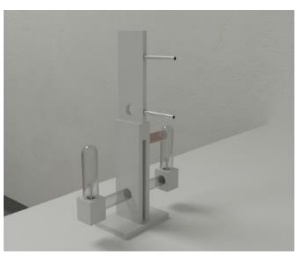
Odor-aversion learning in Drosophila, using electric-shock reinforcement in a copper wire grid. The MazeEngineers apparatus includes a clear , robust apparatus that includes a holding area and T maze choice areas leading into odor compartments. Two tight vacuum seal lines help create negative pressure for odor diffusion. Copper training tube can be easily electrified using a simply included plug. Included in your order is a clamp to ensure minimal odor releas in the testing phase.
Odors not included

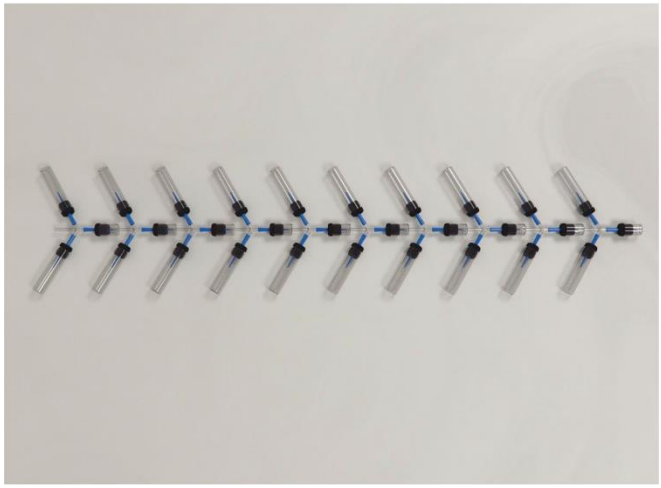
Suggested Color

White





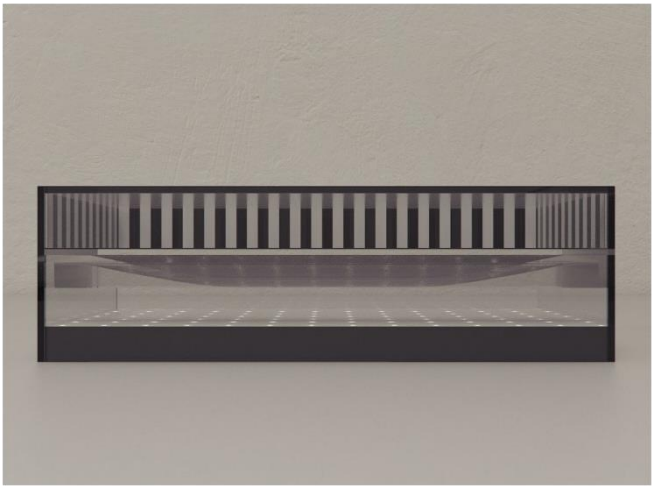




Drosophila Y Maze

Drosophila Y Maze was originally described by Simonnet et al 2014 as a method to efficiently evaluate chemosensory responses in Drosophila. This methodology minimizes stress on the flies (from air flow, manipulation of the flies during the loading step, etc.) which potentially influences olfactory responses.
narrow pipette tips are assembled to prevent flies from returning once they make the vial choice as well as limit odorant diffusion in the Y Maze.
Small loading vials encourage choice making in the Y-maze to maximize participation of Drosophila.
The MazeEngineers apparatus is a Y-shape connector that connects to two glass vials and to a smaller plastic vial (loading vial). 1 ml pipette tips are assembled through the foam stoppers to link the connector to the three vials, creating a tightly sealed Y-maze.
The MazeEngineers apparatus comes with 10 units of 10 connected Y mazes for a total of 100 Y Maze units.

Suggested Color
Clear

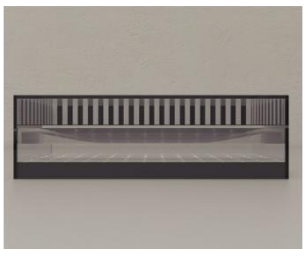


Drosophila Shallow Chamber

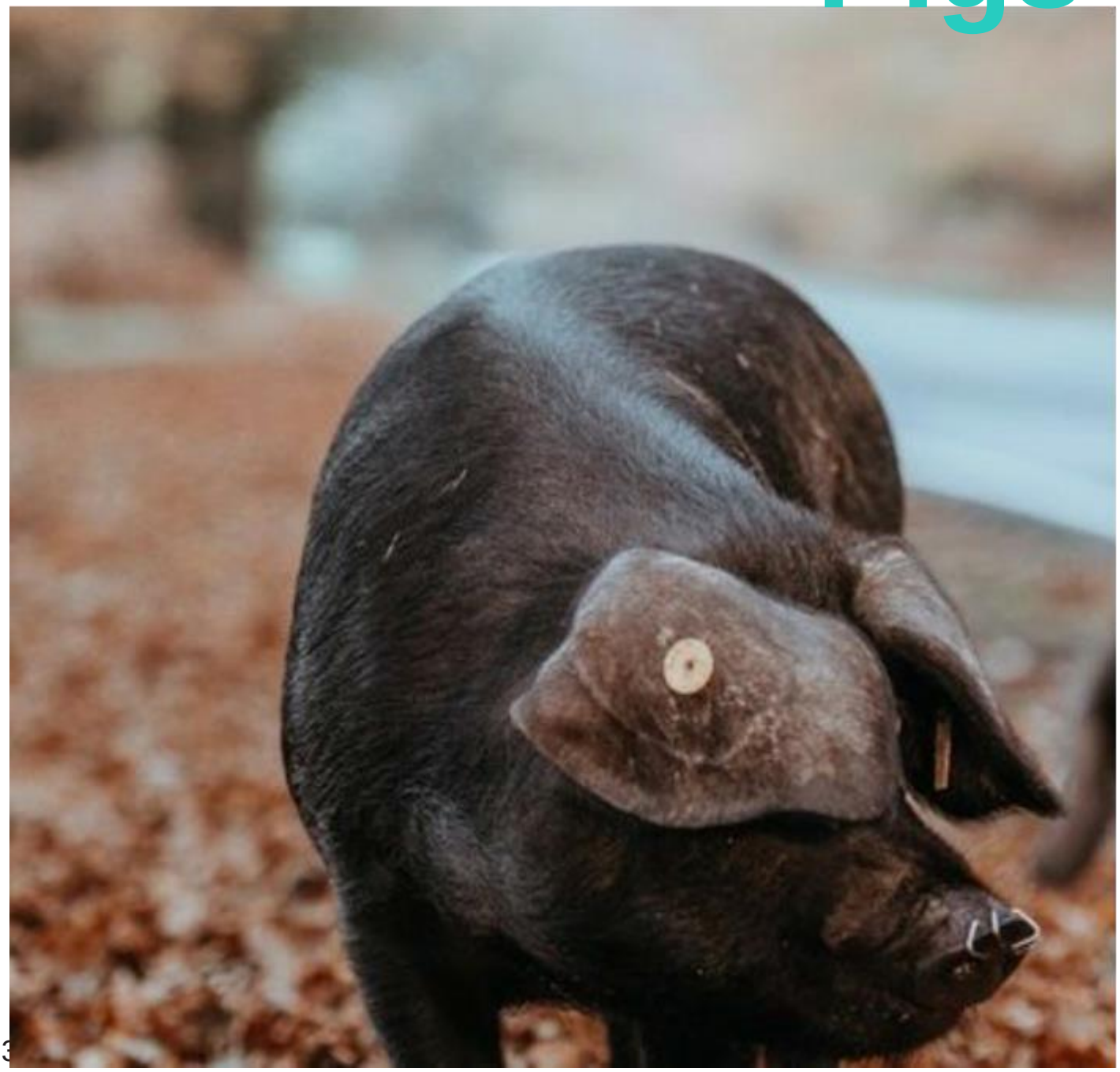
The shallow drosophila chamber was first described by Simon et al (2010) as an innovative design to restrict flies to a shallow volume of space, forcing all behavioral interactions to take place within a monolayer of individuals.
The design minimizes the frequency that flies occlude or obscure each other, and promotes a greater number of flies to move throughout the center of the chamber, thereby increasing the frequency of their interaction and improves the quality of data collected by digital video.
• A slippery glass ceiling limits the duration flies may cling to the ceiling before falling to the floor.
• Groups of 50 flies can be studied within a single chamber.
• Visual stimulus of a 12×12-inch array of 850 nm IR LED mounted underneath the chambers for backlighting.
• 12.7cm diameter chamber for large groups of drosophila.
• 7cm model available for courtship and aggression.

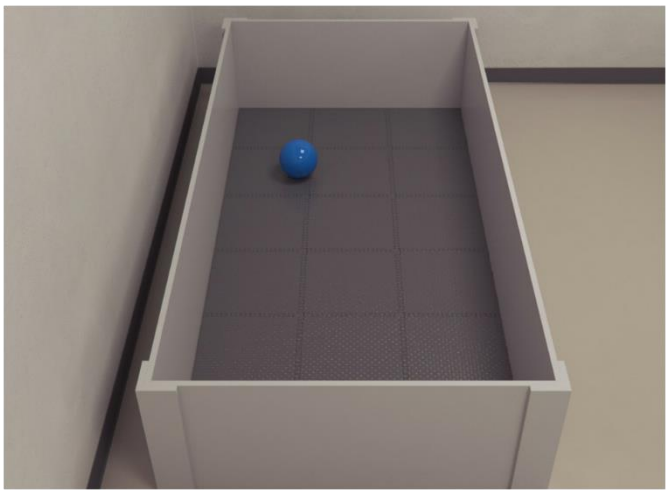
Suggested Color
Clear

d=7cm d=13cm



Pigs





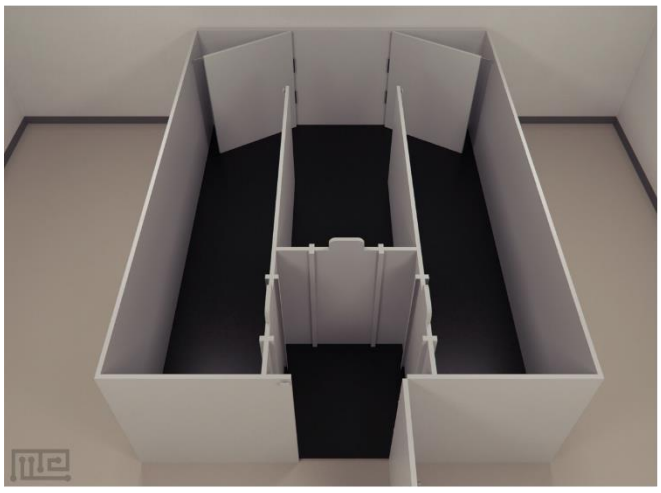
Pig Open Field

Pig are an important tool in the research for TBI given their similarity to humans. Open field behavior to detect a wide spectrum of clinically relevant behaviors in the piglet was first described by Sullivan et al (2013) and relevant behaviors such as sniffing floor, walls, or toy; running, walking, standing still for > 1 sec, lying down, moving the toy, and attempting to escape the test space are assessed.

The field is divided into nine zones and the position of the piglet's snout within the open field was marked at 2 sec time intervals. The MazeEngineers open field includes a ball and acrylic walls to ensure the pen inside the space (1.2 m · 2.4 m pen) with a single toy (19 cm diameter blue ball).

Suggested Color

Grey



Pig Delayed Non-Match To Sample (DNMS) Task

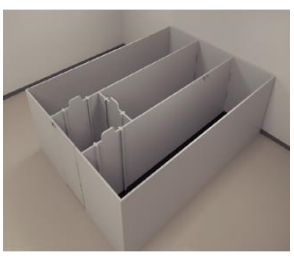
The delayed non-match to sample (DNMS) task is used to analyze the role of the hippo-campal system in spatial learning.

The maze is constructed of dark brown painted acrylic boards. It has arms and a start box. The pigs entered the maze through a door in the back of the start box. The start box also has three guillotine doors, which could be opened by pulling ropes. Two swing doors can close off the arms of the maze.

The task demands the subjects to learn a specific path in the sample phase, remember it during the delay period and choose the novel path during the test phase. The delay period between path learning and test period challenges memory retention. The subjects are motivated with food reward for selecting the novel route.

Suggested Color

Grey with Black



Pig Conditioned Place Preference

The Pig Conditioned Place Preference is used in experiments to investigate pigs' preferences for rooting materials. It is shaped like a capital T.

Eighteen materials are allocated to six categories, each of which consists of three similar materials based on characteristics such as structure, size of particles, complexity, destructibility, and digestibility. Twelve pairs of pigs choose among the three materials of each of the six categories in a balanced design.

Within each category, each pair is given four instantaneous choices among the three materials in a three-armed maze. 'No choice' is scored if the pigs do not enter one of the maze-arms within 90 s.

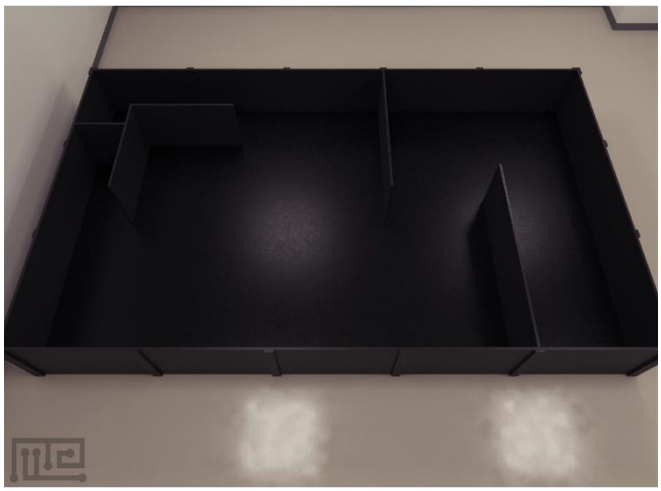
Maze Engineers offer Pig CPP Maze. Custom coloring and customization are available upon request.

Suggested Color

Black

Available

mazeengineers.com/portfolio/pig-conditioned-place-preference



Pig Hebb-Williams Maze

The Pig Hebb Williams maze was used in an experiment by Ingrid C. de Jong et al. (1999) to study learning and memory in pigs. It consisted of a square area with moveable internal walls, allowing the maze to be configured differently for trial. The maze configurations were developed using the concept of the Hebb–Williams maze.

In the experiment, the maze was located in a separate room without olfactory, auditory, and visual contact with other pigs.

Pigs were food deprived for 12hr and were trained to find a food reward (30 g of standard pelleted pig food) at the end of the maze.

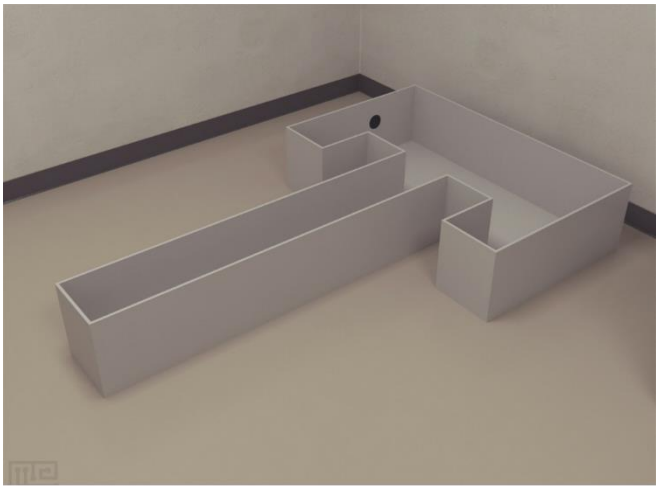
Maze Engineers offer the Pig Hebb William Maze. Custom coloring and customization are available upon request.

Suggested Color

Black

Available

mazeengineers.com/portfolio/pig-hebb-williams-maze



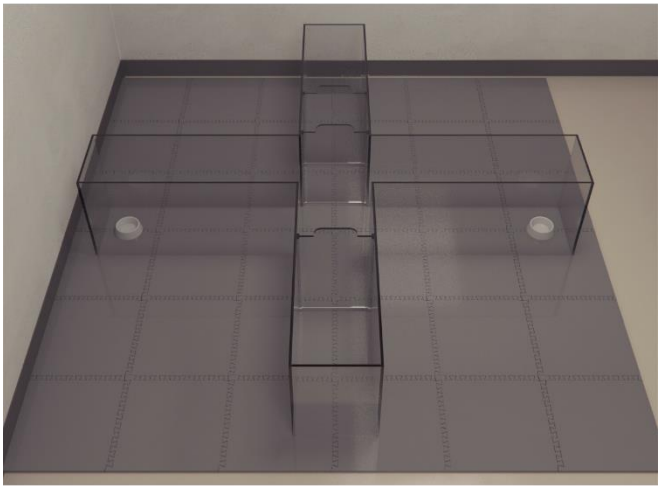
Piglet T Maze

The Piglet T-Maze is used in the assessment of spatial learning and memory of piglets. The maze is based on the conventional T-Maze that is commonly used to evaluate learning and memory performances of rodents. Although, rodents have been a popular animal model in research, a shift towards using piglet animal models is on the rise.

Suggested Color

Grey

Available



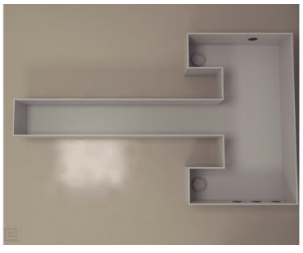
Pig T Maze

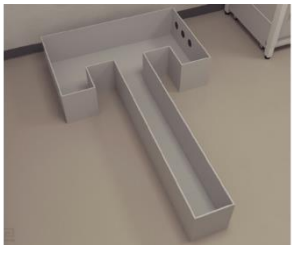
Pigs are an important tool in the research for TBI given their similarity to humans and the 8 arm radial maze is used widely in learning and memory. This maze is based on specifications by Elmore et al (2012) as the first described use in piglets at 2 weeks of age. The Pig T Maze is a clear plastic plus-shaped maze (essentially a double T-maze), positioned over textured black rubber mats. Using a removable barrier, one arm could be blocked off to create a standard T-maze. The plus-shaped design of the maze allowed for the alternation of the start arm during testing. Acrylic walls are designed to hold 2 week old piglets for the novel place and direction learning spatial T maze task. 4 PVC bowls are included in your order.

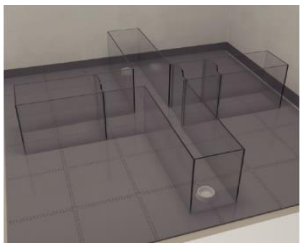
Suggested Color

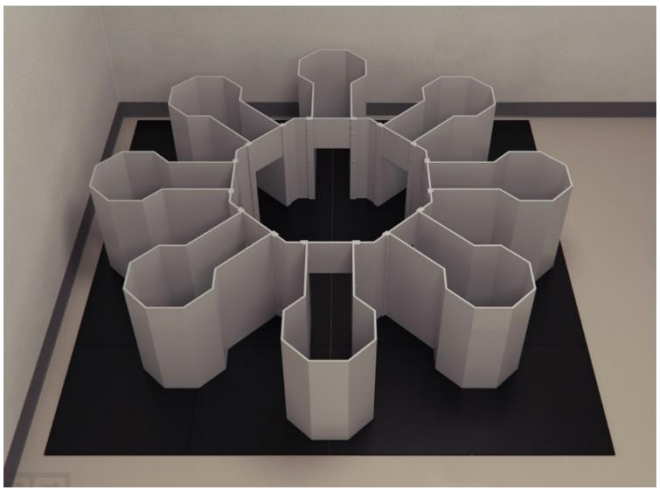
Clear

Available









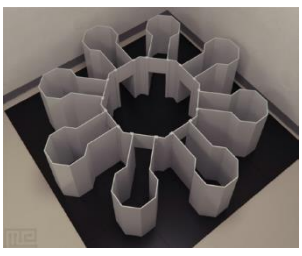
Pig 8 Arm Radial

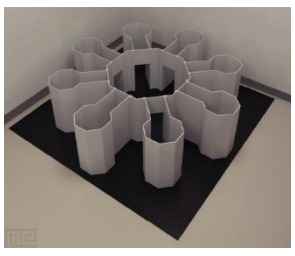
Pig are an important tool in the research for TBI given their similarity to humans and the 8 arm radial maze is used widely in learning and memory. This maze is based on specifications by Dilger et al (2010) as the first described use in piglets at 2 weeks of age. They are trained for a milk reward in 8 PVC bowls with covered lids (included in your order). Intramaze cues are placed with surrounding curtains, and piglets have demonstrated the ability to learn the simple associative acquisition task.

Suggested Color

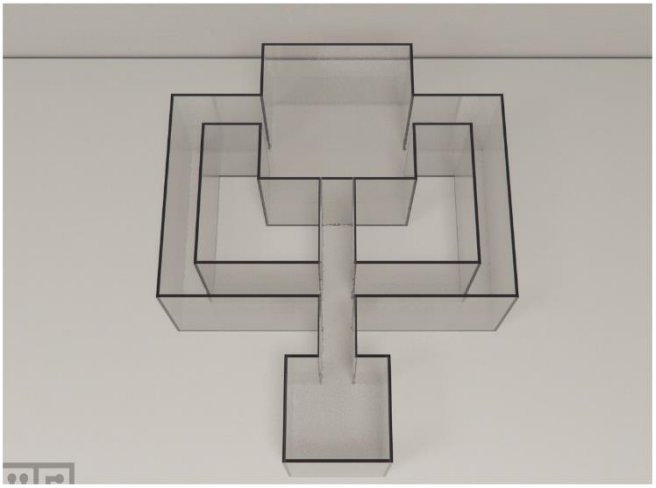
Black with Grey

Available





Zebrafish



Latent Learning Apparatus

The latent learning apparatus is used to analyze the learning and memory function in zebrafish. The apparatus contains a start box and a goal box connected via tunnels. The goal box is provided with stimuli to attract the subjects.

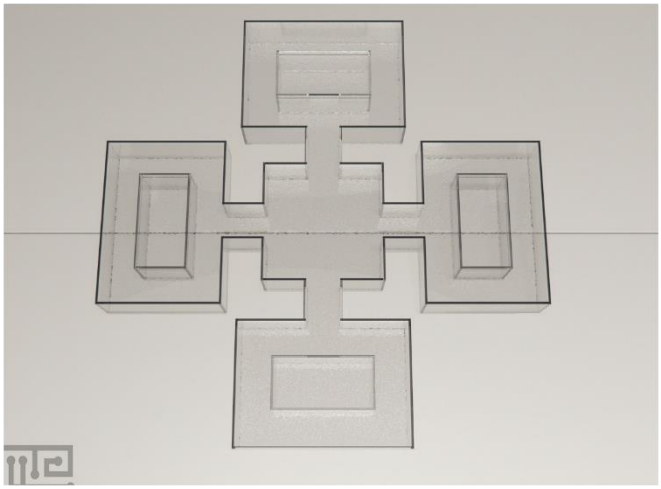
The movement of the fish in and out of the goal box is controlled by modifiable guillotine doors. The walls of the maze are made of acrylic to ensure that subject can have clear visual access to the goal box from all locations.

Mazeengineers offers the Latent Learning Apparatus

Suggested Color

Clear

Available



Zebrafish Plus Maze

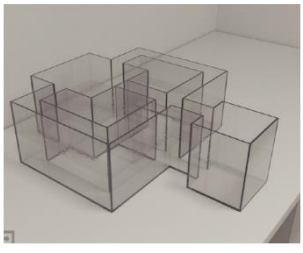
The zebrafish plus maze is a “+” shaped maze that contains four end compartments and one central compartment. It is used to analyze associative learning behavior in zebrafish.
The maze resembles the non-spatial version of the Radial arm maze which is used for rodents.
The subjects are tested for their ability to associate the visual cue with the rewarding unconditioned stimuli while swimming in the maze.
Mazeengineers offers the Zebrafish Plus Maze for both mice and rats. Custom coloring and customization are available upon request.

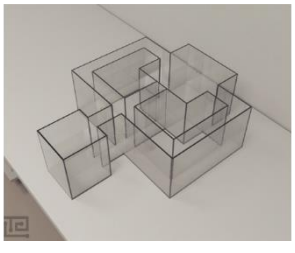
Suggested Color

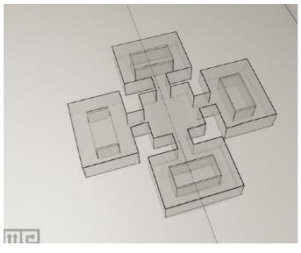
Clear

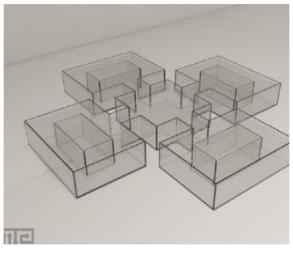
Available

Mouse









Zebrafish Shuttle Box

The Zebrafish Shuttlebox presents an automated method for high throughput learning paradigm testing. In this protocol, two screens are used from an automated computer screen to create computer animated zebrafish images, or any image in which the researcher specifies. This simple paradigm between binary choices makes this a useful high throughput assay for zebrafish.

Suggested Color

Clear

Available

Zebrafish Light Dark

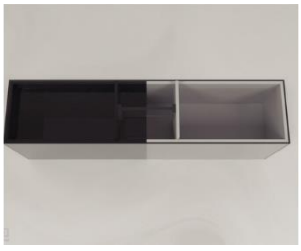
The MazeEngineers Light Dark Tank for Zebrafish is an acrylic tank (15 cm × 10 cm × 45 cm height × width × length) that is divided equally into one-half black and one-half white. Walls and bottom are either black or white, so as to create a similar experimental paradigm to the rodent light dark box.

The tank contains central sliding doors, colored with the same color
of the aquarium side, thereby defining an uncolored central
compartment measuring 15 cm × 10 cm × 10 cm.

Suggested Color

Black and Grey

Available



Zebrafish Black White Preference

The Black white preference tank assesses for wall color stimuli on diving, and the effects of depth stimuli on scototaxis. The Black White preference tank from MazeEngineers allows for three separate configurations

The split-depth tank configuration is composed of one side of the tank that is set to a depth of 10cm using a partition while the other side is set to a depth of 15cm.
In the shallow configuration, both sides can be set to a depth of 5cm.
In the deep configuration, both sides of the tank can be set to 15cm.
Gravel substrate is placed on a floor 5 cm below the plexiglas partition on each side.
The sides of the tank are either left uncovered (transparent), covered in black paper (black), covered in white paper (white), or covered in black on one side, and white on the other.

Suggested Color

Black, Grey, Clear

Available

Zebrafish Sociability

The zebrafish sociability chamber is used for studying the exploration and socialization behaviors in zebrafish. The concept of zebrafish sociability chamber derives from the 3 chamber sociability device used for socialization testing in rodents. The 5-chamber sociability tank analyzes the socialization behavior in fish by allowing them to interact with the social stimuli and explore the tank.

Suggested Color

Clear

Available

Mirror Biting Cattelan

Mirror tests are a popular method used in studies of agonistic interaction, especially in fish aggression studies as they require fewer participants and avoid pseudo-replication. Mirrors also provoke a strong, aggressive response in the subject without endangering them. MazeEngineers offers multiple models of the mirror biting test , as not clear standard has emerged from the literature.

Suggested Color

Clear

Zebrafish Environmental Enrichment Chamber

The three-chamber paradigm is a widely used task to evaluate spatial and non-spatial learning as well as memory in zebrafish. The watertight apparatus from MazeEngineers is outlined by a dark panel; covering one side of each compartment as a visual cue to provide an axis of orientation for right/left discrimination. The apparatus is primarily used for learning and memory but can also be used for various toxicity experiments.

Suggested Color

Clear

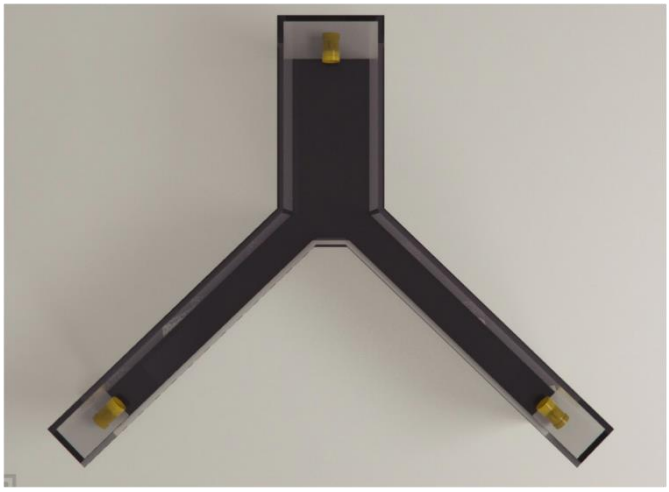
Available

Mirror Biting Pham

Mirror tests are a popular method used in studies of agonistic interaction, especially in fish aggression studies as they require fewer participants and avoid pseudo-replication. Mirrors also provoke a strong, aggressive response in the subject without endangering them. MazeEngineers offers multiple models of the mirror biting test , as not clear standard has emerged from the literature.

Suggested Color

Clear



Zebrafish Y Maze Flow Modification

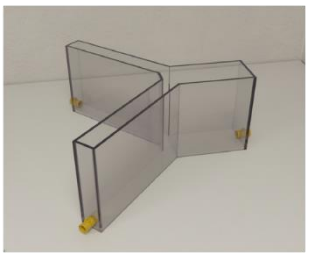
The flow-through Y-Maze is a modification of the Zebrafish Y-Maze. The flow-through Y-Maze apparatus consists of an aquatic tank shaped like a capital ‘Y.’ Two of the arms serve as the goal arms. The modification of the conventional aquatic Y-Maze involves the addition of the pressure controlling flow meters at each intake valve of the goal arms to control and measure the rate of flow of the fluids into the arms.

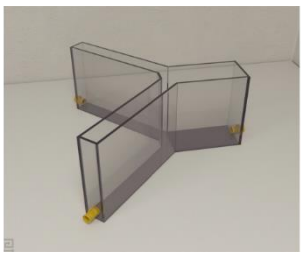
The Zebrafish Y-Maze is an adaptation of the rodent Y-Maze (also see T-Maze). The ‘Y’ design is preferred over the ‘T’ design due to its natural turns. Other Zebrafish based assays include the Zebrafish T-Maze, Zebrafish Three Chamber Choice, and Zebrafish Place Preference Test.

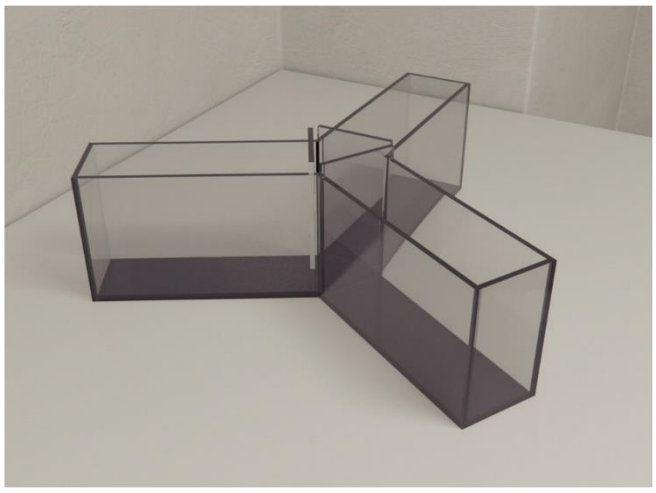
Suggested Color

Clear

Available







Zebrafish Y Maze

The Zebrafish Y Maze was originally validated in the literature by Cognato et al (2012). The Y-Maze memory task uses a simple and rapid training session for novelty exploration. Zebrafish spend more time in the novel arm than in the other arms of the Y-Maze, both in response to novelty and spatial memory training-test intervals.

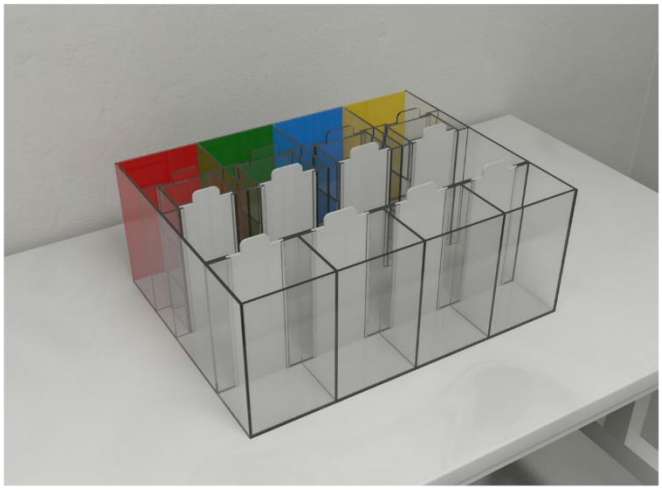
Suggested Color

Clear, Clear with black base, Clear with blue base

Modifications Available

- Zebrafish Outflow
- Zebrafish Y Maze Avoidance

Available



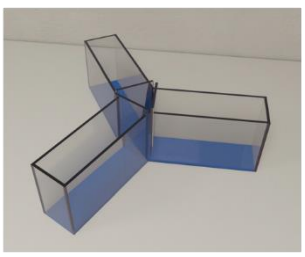
Zebrafish Associative Learning

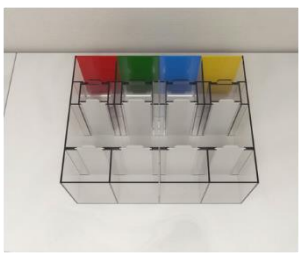
The Zebrafish associative learning chamber is a simple test for evaluating visual discrimination with an associative learning task. The MazeEngineers test allows for simple insertion of color cues for zebrafish to navigate between the Start chamber to the target chamber, and includes the entire package including insertable doors and color cues for your experiment.

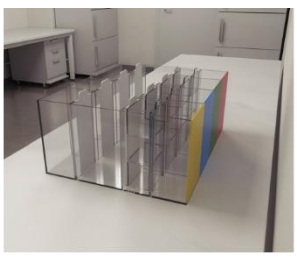
Suggested Color

Clear

Available







Zebrafish Place Preference Test

The MazeEngineers Place preference chamber is created to allow for maximum flexibility for your experiments. The chamber comes with 2 divider slots that allow the zebrafish to choose a chamber or retain the zebrafish in the center area. Floor is clear to allow for location preference. Customized floor patterns can be included in your order upon request. Sizing modifications can be requested within 50% of the original sizing.

Suggested Color

Clear

Available

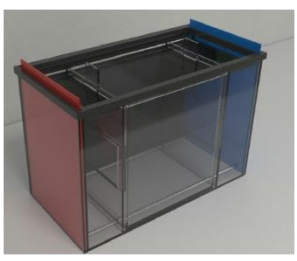
Zebrafish 3 Chamber Choice

The three-chamber paradigm is a widely used task to evaluate spatial and non-spatial learning as well as memory in zebrafish. The watertight apparatus from MazeEngineers is outlined by a dark panel; covering one side of each compartment as a visual cue to provide an axis of orientation for right/left discrimination. The apparatus is primarily used for learning and memory but can also be used for various toxicity experiments.

Suggested Color

Dark clear

Available



Zebrafish Vertical Tank Array

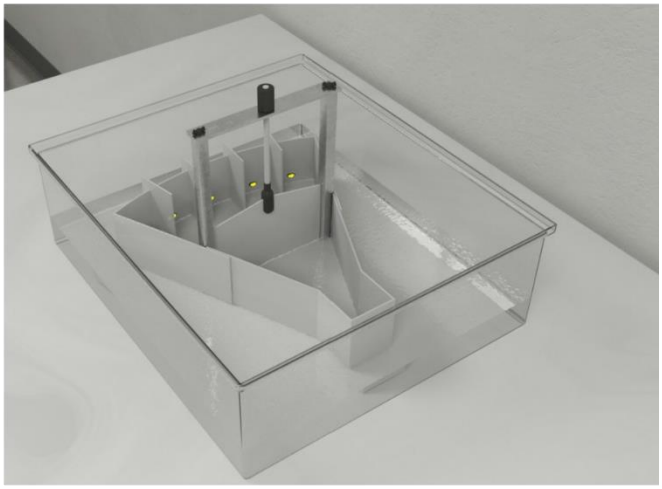
The MazeEngineers Vertical Tank Array is used for anxiety experiments for Zebrafish. Vertical diving behavior is used to assess anxiety in zebrafish. Narrow tanks minimize horizontal movement to maximize the behavior assessment.Each tank holds 1.5L in a trapezoid pattern. Set of 6 arrays come together with a housing apparatus for easy video grading.

Suggested Color

Clear

Available

3 Tank Array **6 Tank Arra**



Zebrafish 5 Choice

The MazeEngineers Zebrafish choice chamber allows for experiments similar to the commonly used five-choice serial reaction time task (5-CSRTT). During testing, lights are illuminated and the gate is raised. A food deliver apparatus delivers reward at a fixed time schedule. The proper light is illuminated in the interval or until the correct entry is chosen. Number of trials, accuracy, omissions, latency, are usually recorded. The MazeEngineers choice chamber includes an automated gate, lights on the proximal and distal ends, and control of lights and gate using the Conductor Software, free with your order.

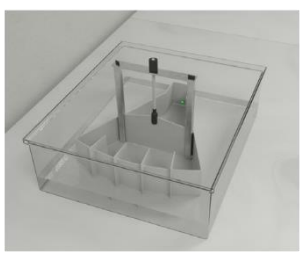
Suggested Color

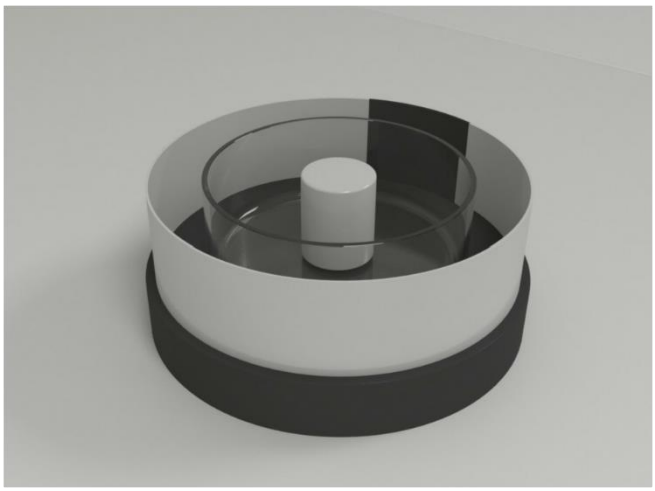
Clear

Available

5 Choice Chamber **Automated Feeder**

External Tank





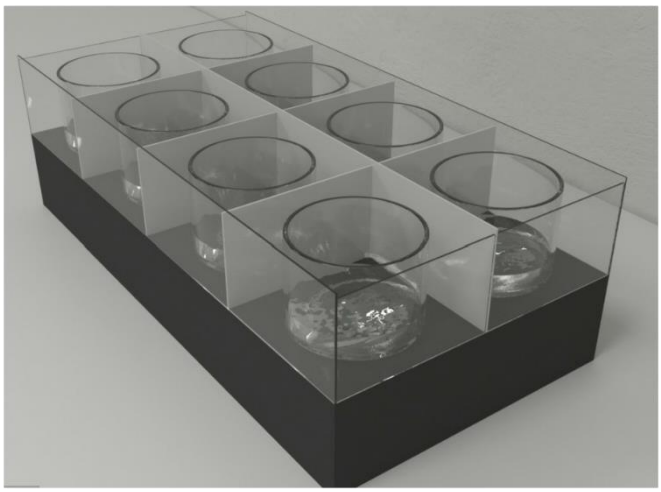
Zebrafish Rotation Test

The Zebrafish Rotation test apparatus is a circular container with transparent walls surrounded by a rotating acrylic drum. This drum can be tagged with cues for zebrafish retinal degeneration experiments. Typically, a black segment is marked on the acrylic. A central post is placed to prevent the zebrafish from swimming across the midline of the innter chamber.
Optional add ons include:
• Backlight underneath the apparatus
• Multi colored outer chamber. For custom pattern requests let us know.

Suggested Color

White with black base

Available



Zebrafish Tap Test

The MazeEngineers tap-elicited swim test is used in free swimming zebrafish to evaluate the effects of EtOH, drugs and toxins on the learning process (non associative). Frequently measured behaviors include the “C-start” response, which increases in latency in early alcohol exposure. The MazeEngineers Tap Swim apparatus comes with 8 easy to use arrays that attaches to an automated tap array underneath. This array is controlled with the Conductor software (free of charge) to control interval taps and timing between interval taps.

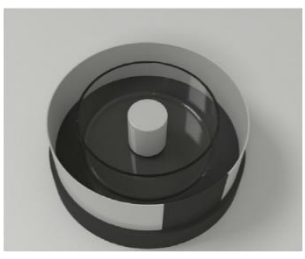
Suggested Color

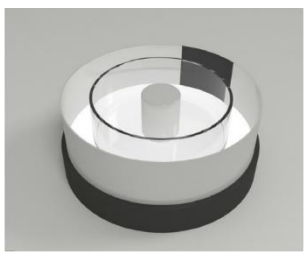
Clear, White

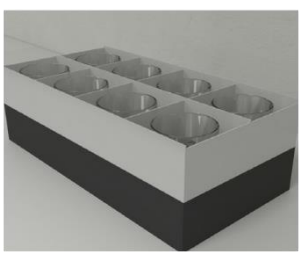
Features

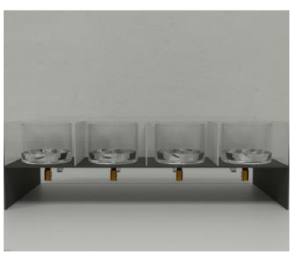
Control Key variables that can be controlled include:
• Stimulus pattern: Number of taps within interval time
• Interstimulus interval
Integrated Integration with Conductor allows for access to Noldus Ethovision control of taps with the Noldus Baton. Set taps depending on zebrafish behavior.

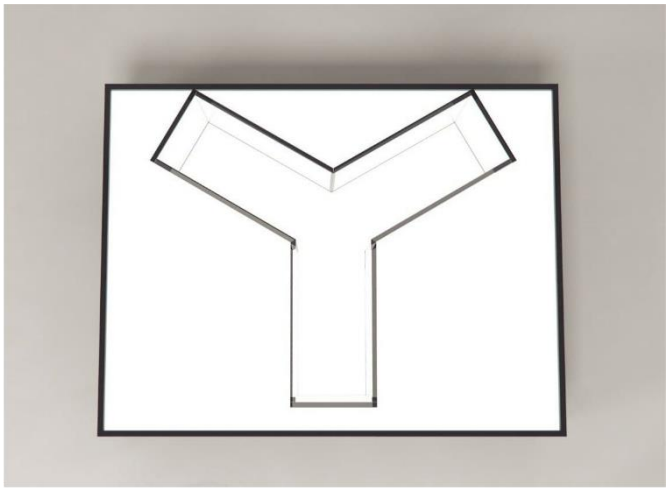
Available











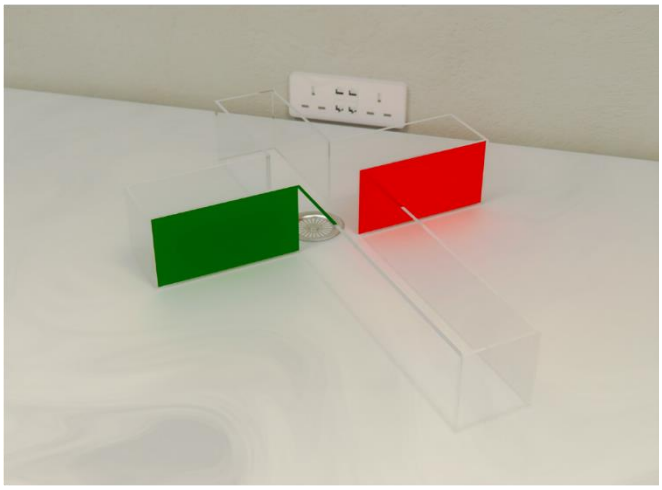
Zebrafish Y Maze Avoidance

The Zebrafish Y maze combines an LCD screen underneath the main Y maze apparatus as described by Aoki et al (2014).
The original apparatus combined a new method by which zebrafish can be trained to avoid one arm of a Y-shaped tank by presenting a specific color on the floor paired with an electric shock.
The MazeEngineers apparatus only includes the LCD screen and Zebrafish apparatus. We DO NOT include software for programming or electric shock. This should be provided by the user.

Suggested Color

Clear

Available



Zebrafish T Maze

The T maze is an enclosed apparatus in the form of a T placed horizontally, similar to the Y maze. The T-Maze is a widely used behavioral task in neuroscience for studying spatial learning and memory. This test is based on the fact that rodents are motivated to explore their environment and locate food quickly and efficiently. This maze gives the animal only two options: the left arm or the right arm, each containing a food reward. Once a food reward is retrieved from one arm, the animals' natural tendency is to alternate their choice and obtain the food reward from the opposite arm. This ability to remember spatial locations has been adapted into a simple behavioral task used to test cognitive function.

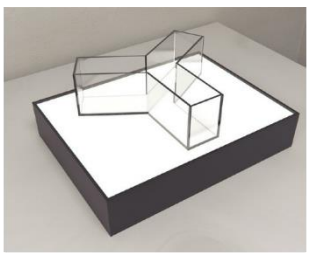
Suggested Color

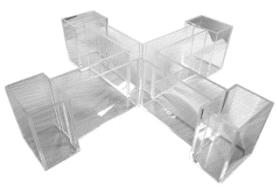
Clear

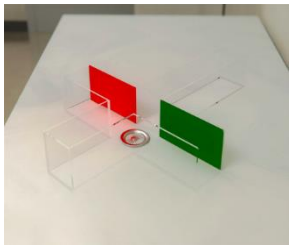
Modifications Available

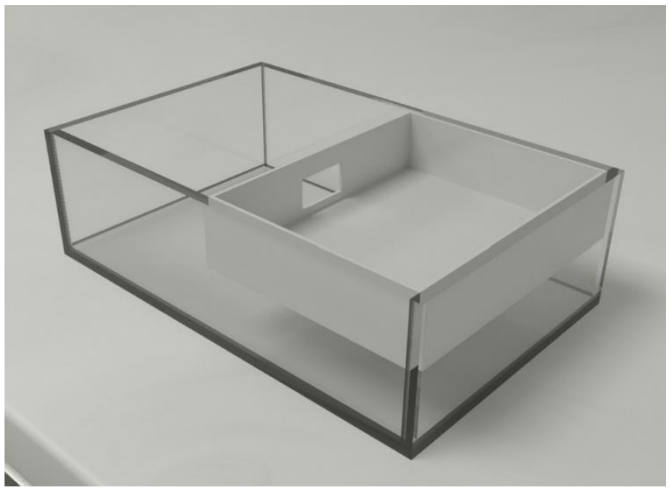
- T Maze Enrichment Chamber
- Food Wells
- Doors (Guillotine)

Available









Zebrafish Bite Test

The MazeEngineers Bite test comes with a plastic apparatus that can be placed inside of the home tank, or a built in apparatus that is continuous with the home cage. The Bite test apparatus (15×12×3.5 cm) is placed inside the home tank, so that it was filled with water to a depth of 3 cm.
It is connected to the main part of the tank by a small opening (3 cm wide) through which the fish can enter the box.
The bite apparatus can be removed for easy cleaning.

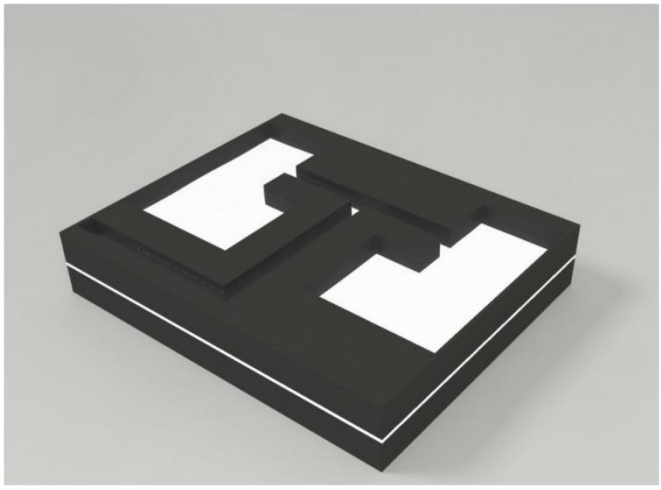
Suggested Color

Clear

Available

BITE TEST CHAMBER

BITE TEST CHAMBER WITH HOME CHAMBER



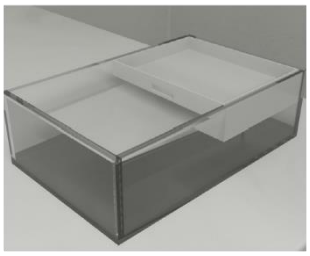
Zebrafish Larvae T Maze

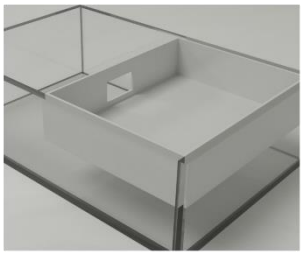
The MazeEngineers Zebrafish larvae T Maze takes advantage of a unique backlighting to allow for fine behavior tasks in larvae. Similar to the Drosophila mazes, this apparatus comes with a start lane, bidirectional swimming pools, and a unique backlight for easy video tracking. An easy to use cover seals the pools and watertight chambers ensures that you'll be able to use this apparatus for years to come. The apparatus comes with:
• Lid
• Chambers
• Backlight
Special Requests can include
• IR Backlight. Please inquire for more details
• Modifications in size up to 50% for older stage larvae

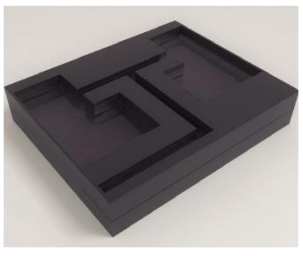
Suggested Color

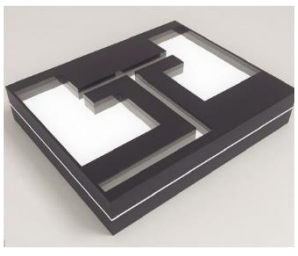
Black, Black and White

Available



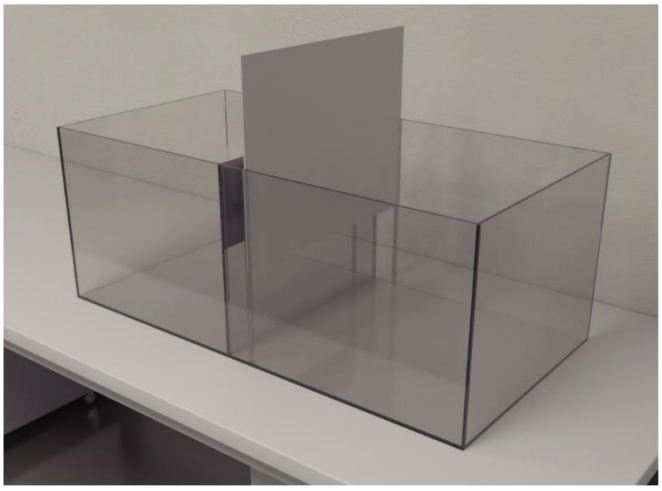






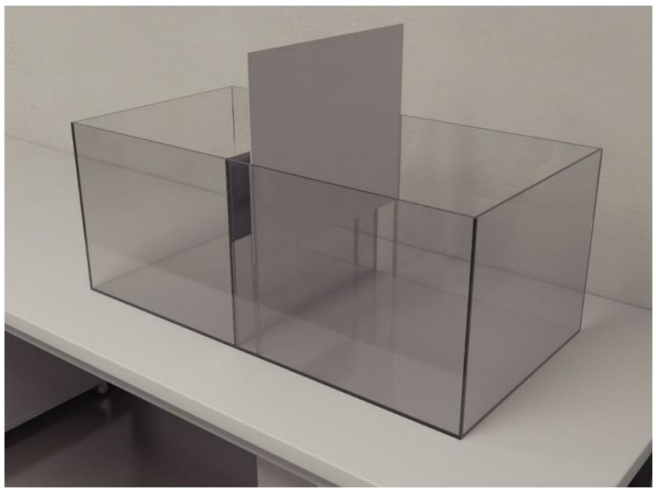
Mirror Biting Elwood

Mirror tests are a popular method used in studies of agonistic interaction, especially in fish aggression studies as they require fewer participants and avoid pseudo-replication. Mirrors also provoke a strong, aggressive response in the subject without endangering them. MazeEngineers offers multiple models of the mirror biting test , as not clear standard has emerged from the literature.



Mirror Biting Balzarini

Mirror tests are a popular method used in studies of agonistic interaction, especially in fish aggression studies as they require fewer participants and avoid pseudo-replication. Mirrors also provoke a strong, aggressive response in the subject without endangering them. MazeEngineers offers multiple models of the mirror biting test , as not clear standard has emerged from the literature.

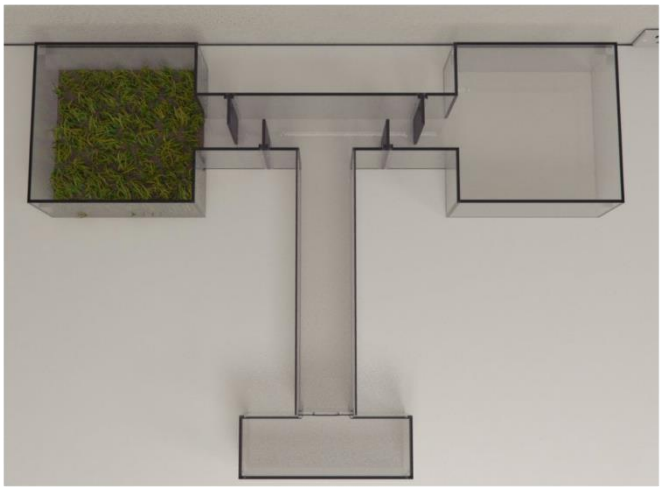


Mirror Biting

Mirror tests are a popular method used in studies of agonistic interaction, especially in fish aggression studies as they require fewer participants and avoid pseudo-replication. Mirrors also provoke a strong, aggressive response in the subject without endangering them. MazeEngineers offers multiple models of the mirror biting test , as not clear standard has emerged from the literature. Click the variants below for more information.

Variants

Elwood, Pham et al, Balzarini et al, Catellan et al



Zebrafish Bifurcating T Maze

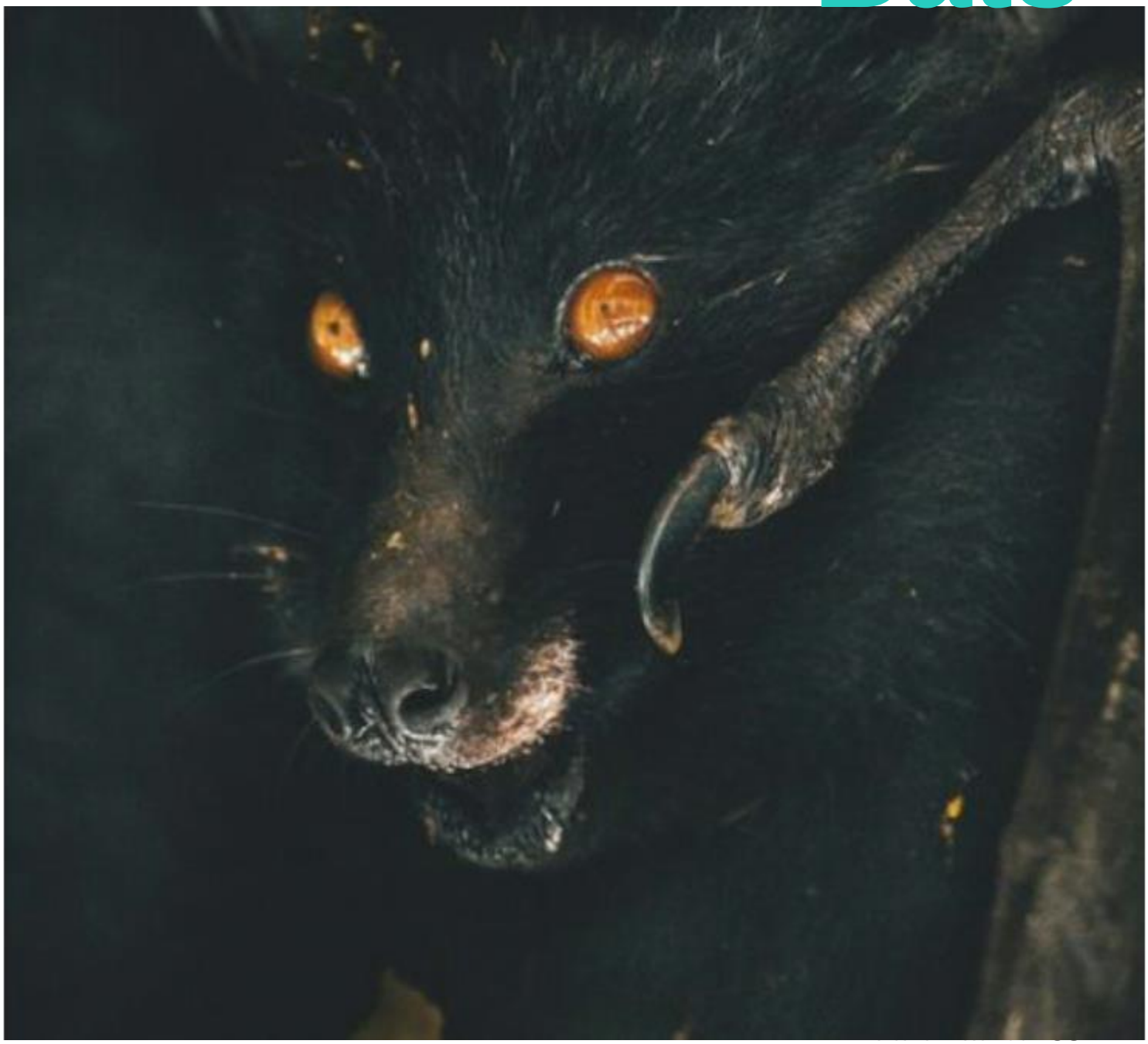
The Zebrafish bifurcating T maze has been described in the literature as a screening test for the role of nicotinic acetylcholine receptors in Zebrafish. It has been traditionally used as a screening maze, but can also be used for choice and learning experiments.

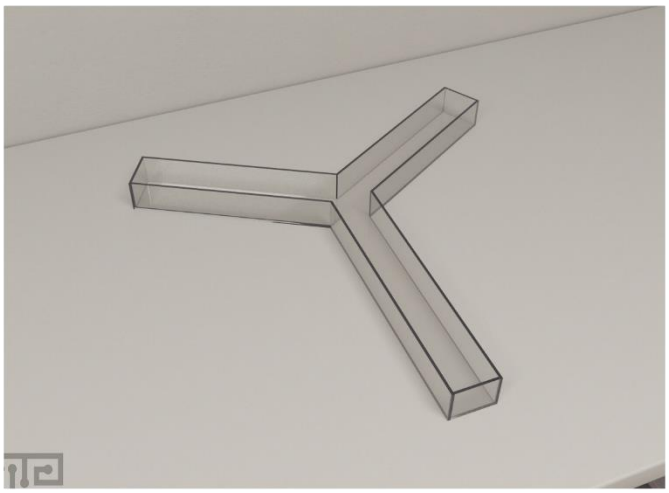
Suggested Color

Clear

Available

Bats





Bat Y-Maze

The Bat Y-Maze which is shaped like a capital Y was used in an experiment by R.J. Kilgour et al. (2013), to assess social preference in bats.

In the experiment, an individual “focal” bat was selected and permitted to move freely within a plexiglass Y-maze, with isolated (caged) “stimulus” bat conspecifics placed at either end of the Y. Stimulus bats were held at the end of each arm of the Y-maze in stainless steel wire-mesh cages. Clear lid prevents flight.

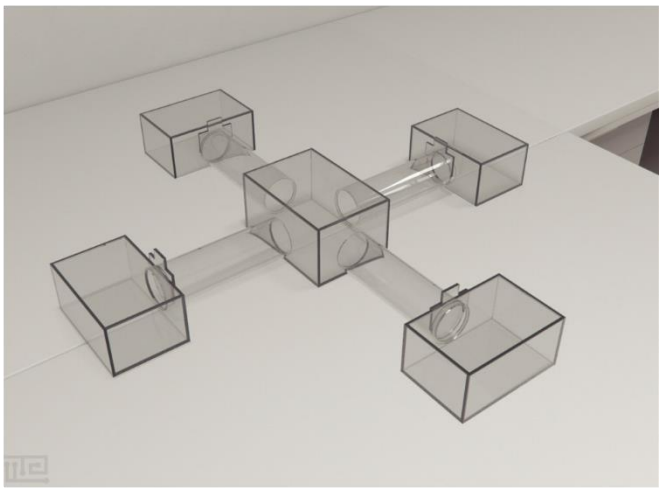
Based on data from the experiment, it was found that some bats show a preference for certain group-mates over others.

Mazeengineers offers the Bat Y-Maze for replication as well as custom coloring and customization upon request.

Suggested Color

Clear

Available



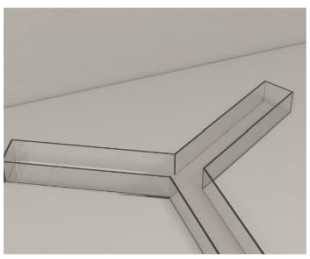
Bat Extended Maze

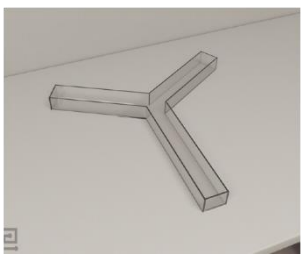
The sentinel use of this maze looked at behavioral flexibility and simple & complex rule learning performance within the context of foraging ecology. This bat maze is a crawling maze to test cognition within multiple species of genus Myotis.

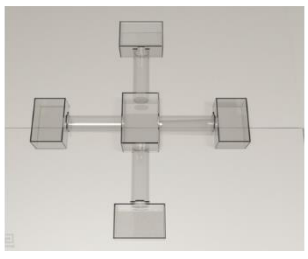
Suggested Color

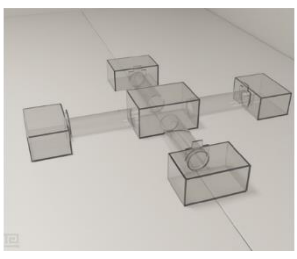
Clear

Available









Ants

Ant Sucrose Feeder 1

The Ant sucrose feeder is used to analyze the effects of private and social information on the decision-making of ants during foraging. The apparatus provides multiple food choices to the subjects and test their ability to differentiate between the two sources.

The apparatus consists of a rectangular platform. One of the shorter sides of the platform is linked to two feeders on either extremity through bridges. Each feeder is circular. The feeders are provided with a platform to hold food source (such as sucrose solution). The opposite side of the feeder side is provided with a bridge for ants to enter the apparatus.

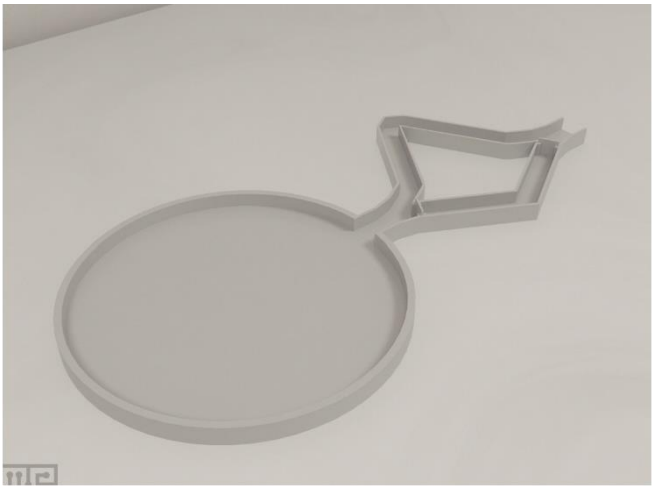
The ant sucrose feeder can be manipulated to challenge the ants to rely either on route memory or pheromones only

Mazeengineers offers the ant sucrose feeder.

Suggested Color

White

Available



Ant Sucrose Feeder 2

The ant sucrose feeder 2 is used to evaluate the collective path preference of ants in terms of distance and food source.

The feeder consists of a diamond-shaped maze made of two V-shaped branches connected through the arms. The maze transports the ants from the nest to the sucrose feeder holding the food source. Each branch is placed at a 60-degree angle to the axis of the center to avoid any interference in the decision making of ants due to the disposition of the branches. A small section of 2 cm connects the long branch to the short branch at both ends. The maze links to the feeder and nest on opposite ends through a small 2 cm long bridge.

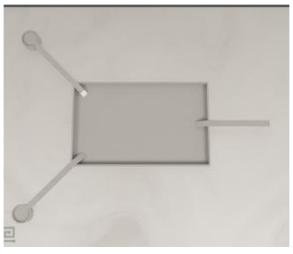
The apparatus tests the route memory of the subjects by providing two paths of different lengths leading to the same food source.

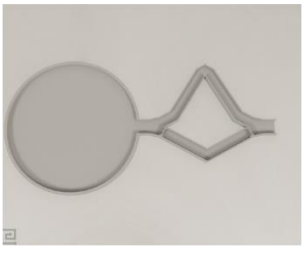
Mazeengineers offers the ant sucrose feeder 2.

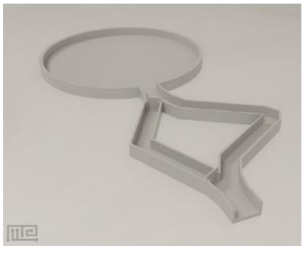
Suggested Color

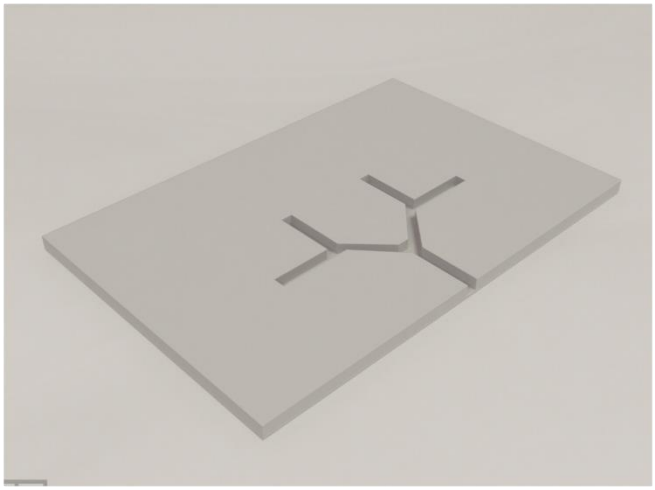
White

Available









Ant Double Y-Maze

The Ant Double Y-maze is a Y-shaped cavity that branches into two additional Y-shaped cavities. It is used to study decision-making and lateralized behaviors of ants.

The Ant Double Y-maze is a modification of the standard Y-maze that is used in rodents and utilizes the same decision-making protocol.

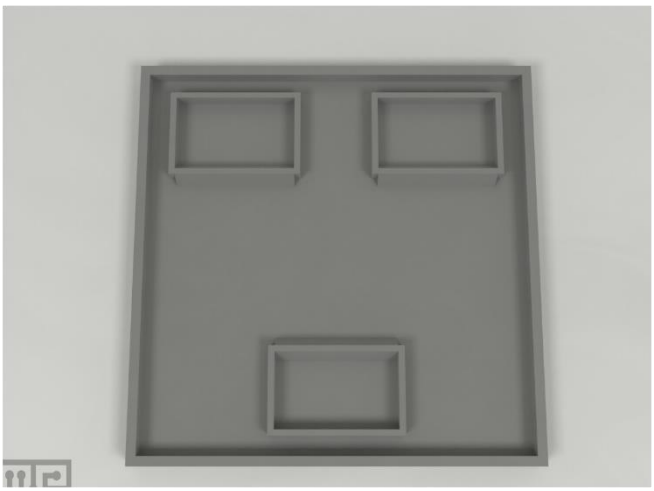
The maze has one longitudinal entrance channel and two symmetrical branching cavities that are perpendicular to each other. Each branch is equipped with a Y-Maze giving a total of 4 goal arms.

Mazeengineers offers the Ant Double Y-Maze.

Suggested Color

White

Available



Diamond Maze

The Diamond Maze was used in an experiment by Hassan M. H. Mustafa et al. (2018), to compare binary choice between two nests in ants.

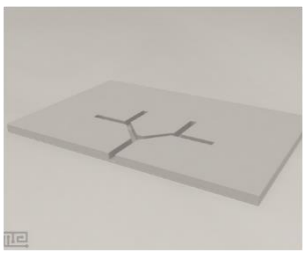
The maze contained three nests two of which were first placed adjacent to one another against one wall of the test arena, one with tethered ants and the other had five strings but no ants. The third is the home nest containing the colony from which the tethered ants were taken which was then placed against the center of the wall opposite to the location of the target nests.

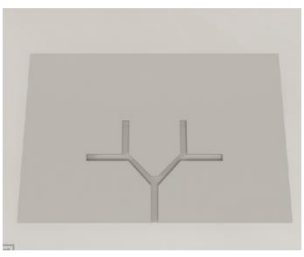
Colonies initially lived in the home nest, from which the roof was removed to induce migration. Colonies were allowed to choose between the two target nests, which were identical in design but contained different materials.

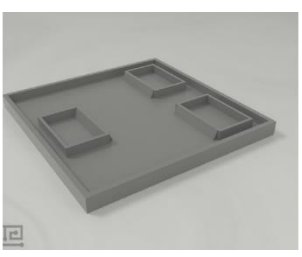
Suggested Color

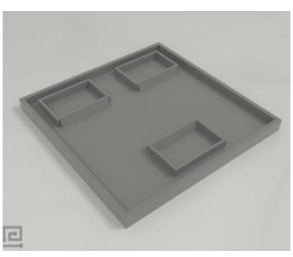
Grey

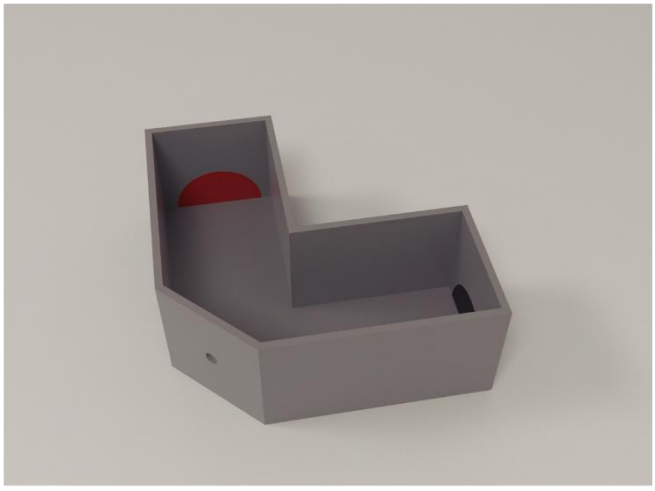
Available











Psyllid Y-Maze

The Psyllid Y-Maze is a V-shaped maze, which was adapted from a conventional Y-shaped maze previously used to test free-flying insects. It was used by Kevin Farnier et al. (2015) to assess visual acuity in psyllids.

The maze was composed of two arms at the end of which pre-printed colour stimuli of varying size were applied.

In the experiment, one psyllid a time was released in a white dot in the middle part of the maze equidistantly located from the end each arm and was allowed 10 minutes to orient and climb on one of the targets. Only insects orientating and subsequently climbing onto a target were recorded as having perceived a stimulus.

Mazeengineers offers the Psyllid Y-Maze for replication or custom coloring and and sizing upon request.

Suggested Color

Grey

Available

Caterpillar Y-Maze

The Caterpillar Y-maze is Y shaped, with two symmetrical arms and one longitudinal section. It was created in an experiment by Douglas J. Blackiston et al. (2008), to access memory retention during metamorphosis.

During an experiment, the larvae make choices between the arms that represent their olfactory memory imprint.

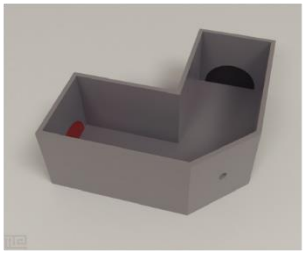
The caterpillar Y-maze allows the experiment to be conducted with larvae and adult moths moving freely for ten minutes, at which time their positions are scored.

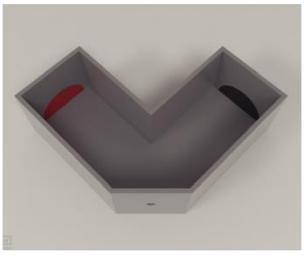
Mazeengineers offer the caterpillar Y-maze. Custom coloring and customization are available upon request

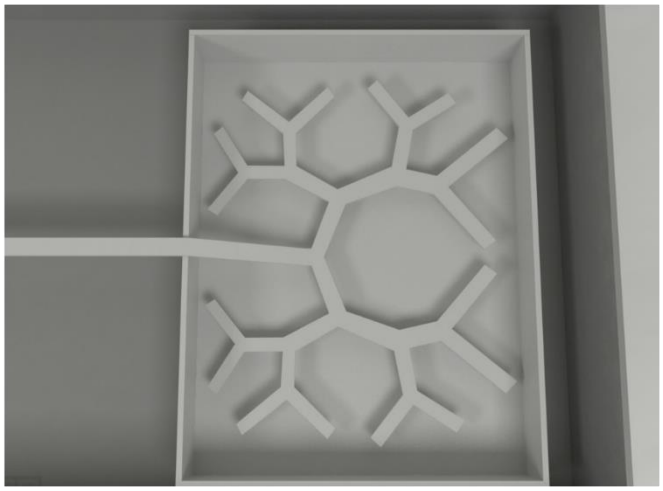
Suggested Color

Clear

Available







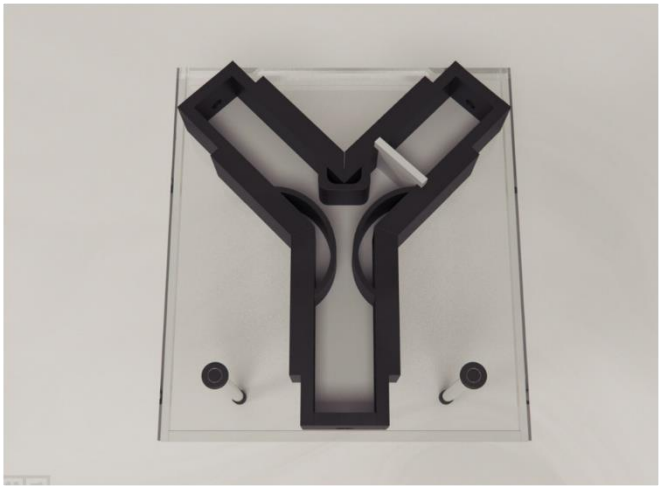
Ant Binary Tree Maze

The sentinel paper with the binary tree maze was used to describe how ants can locate food on one of several ‘leaves’ in a ‘binary tree’ maze. In each trial, one scout was placed on a certain leaf of the binary tree, with food, and could then return to the foragers in the nest. The Mazeengineers binary tree maze comes with both the tree as well as the artificial ant nest. The binary tree comes with 4 forks.

Suggested Color

White

Available



Ant Y Maze

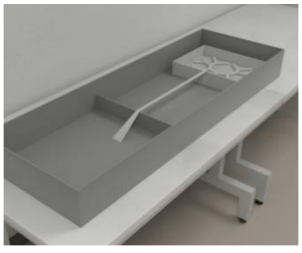
The Ant Y-maze as the name suggests is Y shaped, with two symmetrical arms and one longitudinal section. During an experiment in the Y-maze, the ants make choices between the arms that represent their olfactory memory imprint. The ant Y-maze allows the experiment to be conducted using freely walking ants and focus on the individual behavior of ants. For studying foraging in ants at the colony level, advance set-ups such as the Ant Colony Maze and the Ant Double Bifurcation T are available.

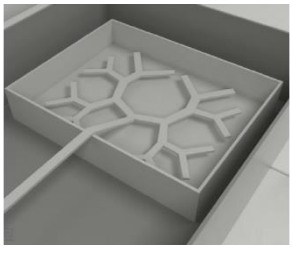
Customization available upon request

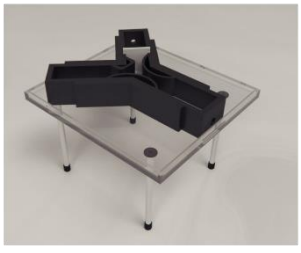
Suggested Color

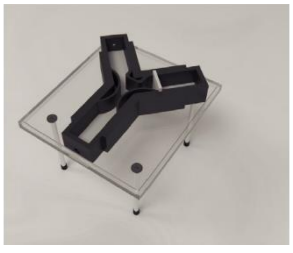
Black

Available









Ant T Maze

The Ant T-maze is used to evaluate the social, spatial, and cognitive behaviors of ants. Conventionally the T-maze is popularly used to study spatial and cognitive behavior in rodents. The Ant T-Maze allows experimentation using colonies, thus allowing observation of communication behaviors as they would take place in the natural habitat.

Customization available upon request

Suggested Color

Grey

Available

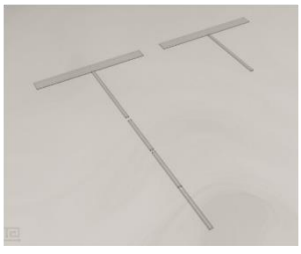
Ant Colony Maze

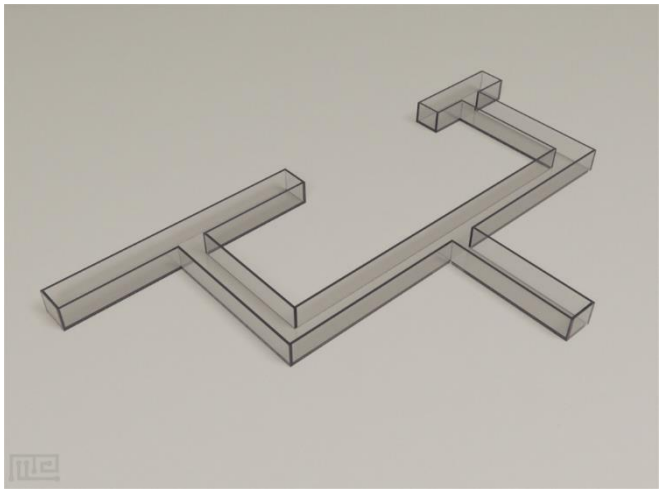
The sentinel use of this open field apparatus is for ants on a colony level for increasing levels of complexity within an open field for foraging of food. This apparatus is for the open field only. For complexity pathways, please contact us to implement, as we will need to customize this for your experimental needs.

Suggested Color

Clear

Available





Ant Double Bifurcation T

The sentinel use of this T maze in ants was to investigate Lasius niger workers foraging on a doubly bifurcating trail with four end points and route learning behavior. Two sizings are available, the short and long version to replicate the original Czaczkes paper, or independently for novel utility. Multiple colors and sizing customization available upon request.

Suggested Color
Clear

Available

Maze **Bundle**

Honeybee Y Maze

The Honeybee Y maze was used in an experiment by Julie Benard and Martin Giurfa (2004), to assess learning and memory as it applies to transitive Inferences in honeybees.

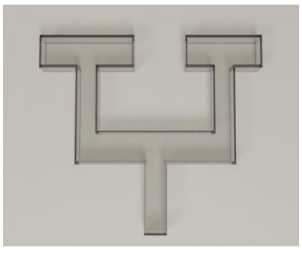
The apparatus is Y-shaped with a UV-transparent Plexiglas ceiling to ensure natural daylight conditions within the maze. A sliding door guaranteed that only one bee at a time could enter the maze. On their back walls, a visual stimulus was presented. Only one of the two stimuli was reinforced with sucrose solution. The nonreinforced stimulus presented a similar but empty micropipette in its center.

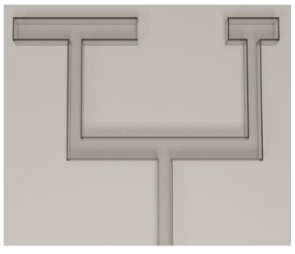
Once in the maze, the bee had to pass through an entrance hole in the middle of a frontal panel to enter into the decision chamber. In this chamber, the bee had to choose between the two arms of the maze.

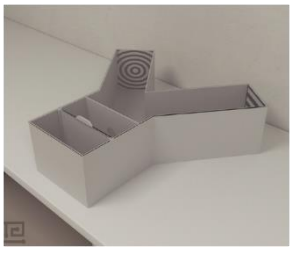
Mazeengineers offers the Honeybee Y maze

Suggested Color
Grey

Available







Bees

Path Regularity Mazes

Path Regularity Mazes are used to assess learning and memory in bees. The maze consists of a number of vertically oriented cylinders, covered by a sheet of transparent perspex. These cylinders are used as modules to construct mazes with various configurations. Each cylinder has three holes positioned halfway up the wall of the cylinder.

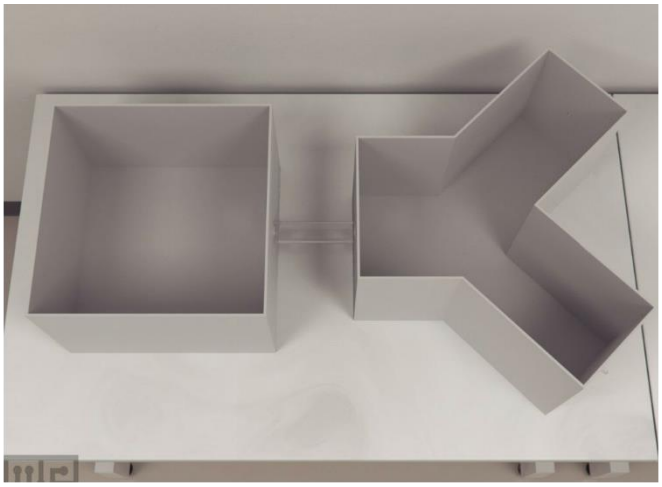
A bee flying a correct path through the maze enters a cylinder through one hole and could leave through one of two exit holes. One of these holes represents the correct path continuing through the maze, while the other one leads to a cylinder representing a dead end. Bees have to learn the entire sequence of turns through the maze.

The final cylinder on the correct path contains a feeder that provides a solution of sugar water, which the bees could drink ad libitum. After feeding, bees are released from this cylinder by raising the transparent cover temporarily.

Suggested Color

Clear

Available



Bumblebee Y-Maze

The Bumblebee Y maze was created in an experiment by Johannes Spaethe et al. (2003), to determine quantitatively the relationship between eye optical quality and behavioral ability at target detection over a range of sizes of insects of the same species, the bumblebee Bombus terrestris. It shows that large individuals outperform small ones as a result of an improved optical setting (larger facets combined with smaller interommatidial angles).

Bumblebee colonies were connected to a flight cage via Plexiglas tube. Shutters between the nest and the arena allowed them to control access of selected workers.

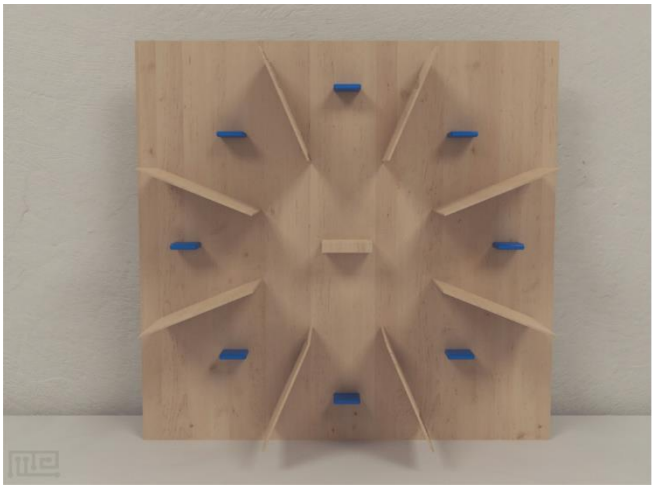
The arena has the shape of a Y-maze with an entrance chamber and two tunnels branching from a trilateral decision chamber.

Mazeengineers offer the Bumblebee Y maze. Custom coloring and customization are available upon request.

Suggested Color

Grey

Available



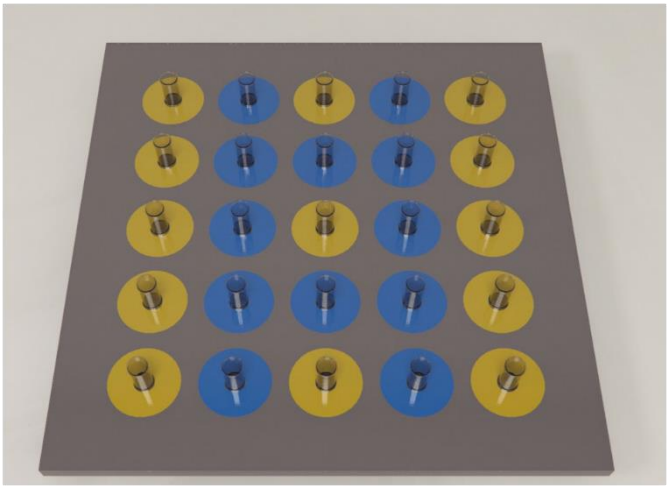
Bee Radial Arm

The Bee Radial arm maze (RAM) was originally described as a method to study sublethal doses of insecticide on bee behavior. Spatial working memory is a key cognitive domain for pollen and flower strategy, and this RAM is a novel utilization of the rodent version in Bombus terrestris (bumblebee). The apparatus consists of a circular array of eight artificial flowers on a vertical board with 10×15 cm acrylic baffles between each flower.

Suggested Color

White, Black, Grey, Brown, Blue

Available



Bee Reward Expectations Apparatus

Bees can learn to associate colors with a sugar reward in a setting closely resembling a natural foraging situation. This apparatus allows the researcher to pair sucrose (or other solutions) in an artificial flower patch to study reward expectations.

This artificial flower patch consists of 24 Eppendorf tubes (4 cm deep) that function as flowers. This is included in your order. They are regularly distributed over the surface of a foraging arena. This arena consists of two superposed acrylic plates, creating 24 holes of 1cm in diameter. The lower plate is created with a 0.7-cm thick opaque acrylic plastic, while the upper square was a 0.2-cm thick transparent Plexiglas.

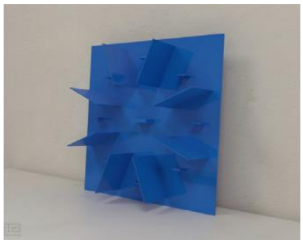
The tubes are placed inside the holes and raised 1.8 cm above the upper surface of the transparent Plexiglas. 24 color signals, 12 yellow and 12 blue, can be are visible to the bees through the upper transparent Plexiglas plate.

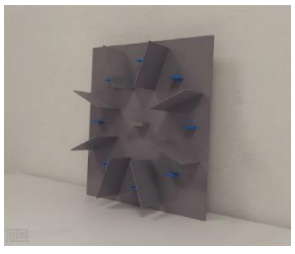
The flowers were held by the upper surface of the patch and the colored circles were set below this surface, both the flowers and their corresponding visual stimuli could easily be replaced between trials.

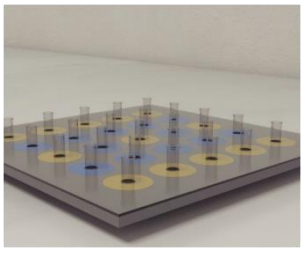
Suggested Color

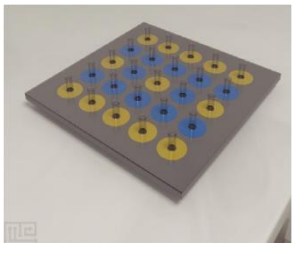
Grey

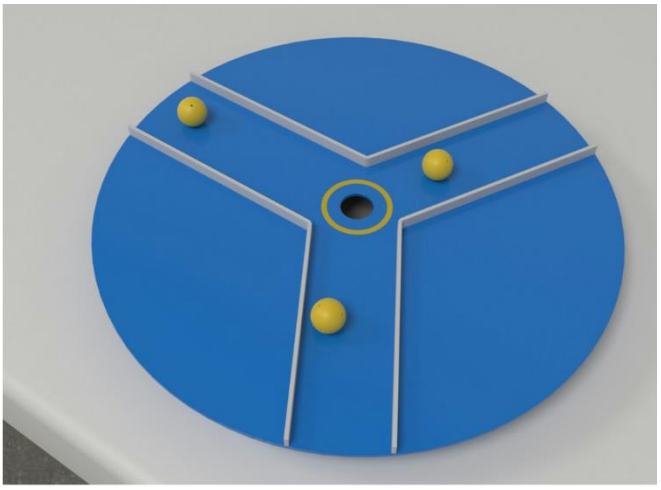
Available







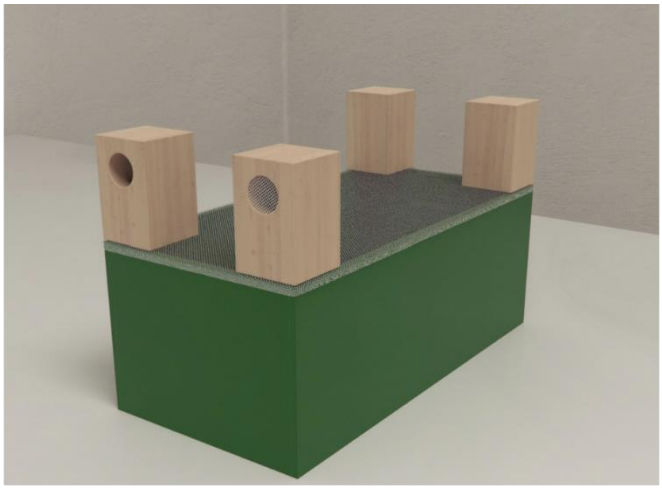




Bee Soccer

Replication kit for bumblebees show cognitive flexibility by improving on an observed complex behavior.
Kit #1 components:
• Home , Corridor, & Test arena
• Test Platforms (2)
• Square Platform (1)
• Yellow Balls (8)
Kit #2 components:
• Plastic model bumblebee (1)
• Full Platform (1)
• Full walled platform (1)

Suggested Color
Blue



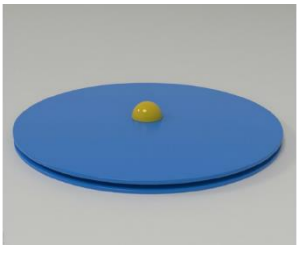
Bee Spatial Reorientation

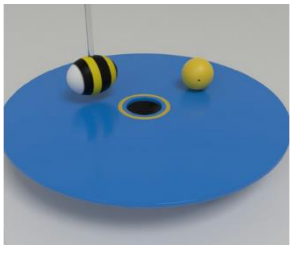
The Bumblebee spatial reorientation apparatus is a rectangular enclosureof green acrylic with an overlying insect net. 4 wooden L shaped blocks are placed in each corner and allows for access from the inside of the enclosure.
the apparatus was originally described by Sovrano et al to study spatial reorientation abilities of bumblebees (Bombus terrestris). The apparatus is used to test spatial disorientation, by passive rotation both clockwise and anticlockwise, and a challenge whereby bumblebees had to find one of the four exit holes located in the corners of a rectangular enclosure.

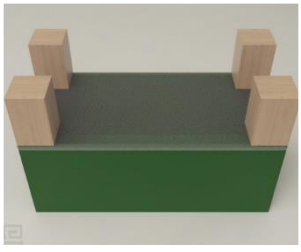
Suggested Color
Green

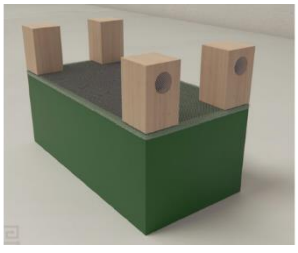
Available

Bumblebee

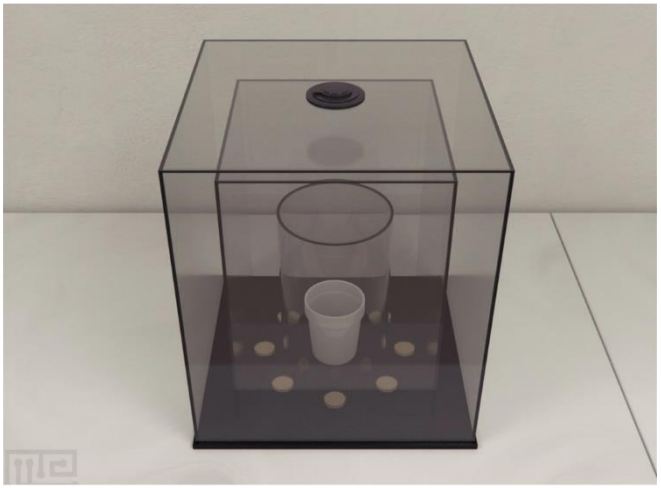








Plants



Plant Communication Apparatus

This plant communication apparatus was first used by Gagliano et al (2013) for chilli plants (Capsicum annuum, Solanaceae) for discrimination of adult conspecific and a fennel plants despite blocking of common signaling through the apparatus.

This experimental set-up prevents above and below ground contact as well as chemical and light-mediated signals normally exchange by plants. The apparatus can be used to search for alternative signaling modalities or control specific signaling.

Chilli seeds are classically arranged in a circle around the adult plant sealed the central cylindrical box. Seeds and adult plants in each unit are housed within 2 different sized square boxes, one inside the other, with the air in between the two boxes removed using a vacuum pump (not included).

Two different sized square boxes are placed inside the other, with the air in between the two boxes removed using a pump to create a vacuum and thus avoid interference between adjacent experimental units at any time. The MazeEngineers unit is made with colorless cast acrylic material (Moden Glas), which transmits 92% of visible light, but is opaque to ultraviolet and infrared wavelengths

Suggested Color

Clear

Available

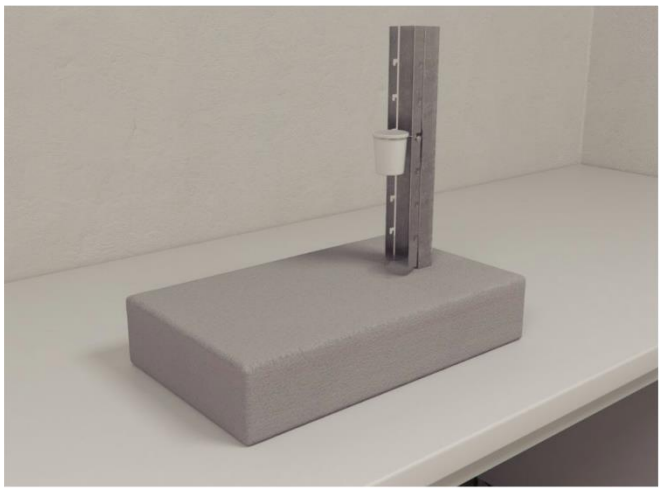
Plant Y Maze

This Y maze for plant rooting behavior, originally used in the model organism Pisum sativum, can be broadly used for interrogating the mechanism by which roots sense and locate water and other stimuli. The device is made of PVC plastic. It can be filled with soil and comes with two tightly fitting small black plastic pots and two transparent rectangular plastic trays at each lower end.

Suggested Color

White

Available



Mimosa Habituation

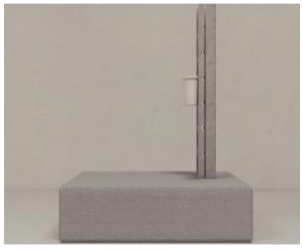
The rapid closure of Mimosa's leaves in response to mechanical disturbances such as controlled rop is believed to be a defense tactic to reduce predation risk. The Mimosa Habituation apparatus allows for such controlled falls for habituation training. Each disturbance causes the mimosa leaflets to fold along the stem, and droop downwards.

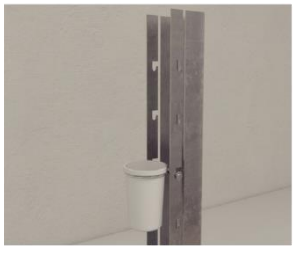
The apparatus consists of an acrylic container mounted with to a marked steel rail. A soft foam base lies underneath. Individual potted plants can be elevated to the 15-cm height mark and allowed to drop by sliding along the rail. A shallow depression in the foam base prevents bouncing at impact.

Suggested Color

Grey

Available





Cephalopods

Cuttlefish T-Maze

The Cuttlefish T Maze is used to access spatial cognition in cuttlefish. It was created in an experiment by Christelle Jozet-Alves et al. (2008).

The apparatus consists of a white plastic tank with internal divisions forming a T-maze. The stem of the T serves as the start box and the identical arms of the T lead to the goal compartments.

The cuttlefish learns how to enter a dark and sandy goal compartment to escape from the light. Each trial allows only a single choice of direction (right or left arm).

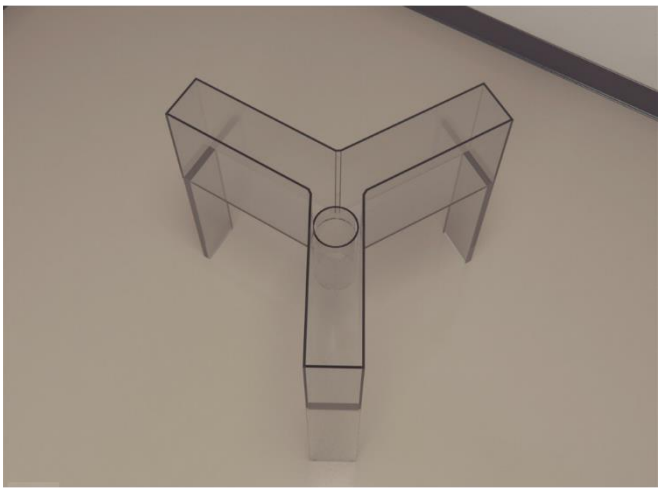
In the experiment, if the cuttlefish entered the incorrect arm and consequently failed to reach the goal compartment, it was immediately removed and replaced in the start box.

Mazeengineers offer the Cuttlefish T-maze. Custom coloring and customization are available upon request.

Suggested Color

Grey

Available



Octopus 3 Choice Maze

The Octopus 3 choice Maze consists of a narrow central tube opening into three choice compartments and was based on the natural probing movement which octopus arms often perform when exploring and hunting in small crevices and under rocks.

A black disk in the goal compartment visually marks the presence of a small piece of food, which is moved between choice compartments in a random sequence. In order to reach the food reward, octopuses have to reach a single arm through the tube, out of the water (thus preventing chemical cueing), and into the water of the goal compartment.

Mazeengineers offer Octopus 3 choice Maze. Custom coloring and customization are available upon request.

Suggested Color

Clear

Available

Octopus Round Arena

The Octopus Round Arena is a maze constructed from a dark gray, round fiberglass tank with two burrows cut into the bottom of the tank.

It is used in experiments to demonstrate that cephalopods are capable of conditional discrimination thereby extending the limits of invertebrate complex learning.

Octopuses are trained in two maze configurations (the conditions) in which they are required to select one of two particular escape routes within each maze (the discrimination). Conditional discrimination can be demonstrated by selecting the correct escape route in each maze.

Mazeengineers offer Octopus Round Arena. Custom coloring and customization are available upon request.

Suggested Color

Blue

Available

Summary

3D Radial Arm Maze	Size	Arm Length	Arm Width	Sidewalls Heihgt
	Mouse	51	11.2	1
	Rat	68	15	1
		Interior Length	Interior Width	Interior Height
Active/Passive Avoidance Shuttle Box		18	18	20
	Mouse			
	Rat	25	25	25
Adjustable Platform		Top Width	Base Width	
	Mouse	4 cm to 9 cm available	12 in	
	Rat	10 cm to 16 cm available	12 in	
		Length	Height	
Aron's Test		18	25	Height
	Mouse	27	37	16
	Rat	Overall Length	Overall Width	24
		120	120	Height
Asymmetric Walkway		200	200	70
	Mouse	Start area	Testing area	115
	Rat	5 in x 8 in	7 in x 8 in	Chamber Length
		6 in x 10 in	9 in x 10 in	12 in
Attentional Set Shifting (IDED) Chamber		Arm Length	Arm Width	15 in
	Mouse	35	5	Wall Height
	Rat	50	10	10
		Arm Length	Arm Width	20
Automated 8 Arm Radial Maze		35	5	Wall Height
	Mouse	50	10	20
	Rat	Length	Width	30
		40	40	Height
Automated Elevated Plus Maze		60	60	35
	Mouse	Total Width	Arm Width	45
	Rat	105	10	Height
		136	12	20
Automated Hole Board		Arm Length	Arm Width	30
	Mouse	35	5	Arm Height
	Rat	50	10	20
		Length	Height	30
Automated T Maze		125cm to 1m available	50	End box
	Mouse	125cm to 1m available	60	20×20 x 20
	Rat	Diameter	Holes	25×25 x 25
		92	20	Hole Diameter
Automated Y Maze		122	20	5
	Mouse	Length	Width	10
	Rat	20	9.6	Height
		Aisle Width	Corridor Length	8
Balance Beam		5	30	Height
	Mouse	10	50	30
	Rat	Length	Width	50
				Height
Barnes Maze				
	Mouse			
	Rat			
Bee Spatial Reorientation				
	Bumblebee			
Body Turning Test				
	Mouse			
	Rat			
Bowtie Mazes				
	Mouse (Projection)			
	Rat (Projection)			
	Mouse (Choice)	80	60	30
	Rat (Choice)	120	50	50
Casters		Length	Width	Height
	Type A Mouse	91	86	
	Type A Rat	122	122	
	Type B Mouse	90	60	
	Type B Rat	103	70	91
		Total Width	Total Depth	97
Conditioned Place Preference		46	27	Total Height
	Mouse	86	47	30
	Rat	Arm Length	Wall Height	40
		70	20	Width
Continuous Angled T Maze		110	30	6
	Mouse	220	30	10
	Rat	Length	Width	10
	Large Rodent	45	45	Outer arm doors
		60	60	9
Continuous Novel Object Recognition		Single Arm Length	Single Arm Width	12
	Mouse	18	6	Height
	Rat	30	10	6
				10
Controlled Y Maze				
	Mouse			
	Rat			

All sizes in CM

Segment 1	Segment 3	Central hub, d	End Panels	Price (USD)	Est. Shipping (USD)*
15.2 × 11.2	35 × 11.2	30	20.2 × 11.2	3290	
20 × 15	46 × 15	40	27 × 15	3490	
Exterior Length	Exterior Width	Exterior Height	Grid dimension		
22	22	25	20×20		
				6900	
30	30	30	27×27	7900	
				450	
				490	
				3900	
				4900	
Side platforms (4)	Individual Pegs(88)	Bend length			
20 x 20	20 x 1 x 0.5	2.5		1890	
33 x 33	33 x 1.67 x 0.83	4.2		1990	
Chamber Width	Chamber Height	Cups Diameter			
8 in	7 in	2.5 in	Cups Height		
10 in	9 in	2.5 in	1.5 in	2300	
			1.5 in	2400	
				8500	
				8900	
Stand Height	Edge Bumper				
61	1			3890	
61	1			4890	
Diameter Holes					
3					
3				2990	
Total Length				3995	
55	Across the T	Vertical Stem	Return Hall Width		
74	85	35	10	4900	690
	112	50	12	5900	790
				3900	690
				4900	790
Width Beam					
6,12, 24, 48mm				1490	
6,12, 24, 48mm				1790	
Stand Height					
95				2290	
95				2490	
Insect Net					
21 x 10 x 3	4 Corner Blocks				
	4.5 x 2.8 x 2.8			1490	
				490	
				590	
Middle Chamber Length	Chamber Wall Long Length	Chamber individual wall	Angles		
20.5	38	20.5	150	1690	
34	63	34	150	1890	
10				2290	
16				2490	
				1490	
				1490	
				890	
				990	
Corridor Height	Corridor Width	Door height	Door width		
30	20	30	8	1390	150
40	25	40	10	2290	300
				2690	
				3490	
				4590	
Central arm door					
18				1890	
24				1990	
				995	
				1195	

Drosophila Maze Array		Lane Width	Lane Length	
	T (25 Units)	0.13 in	0.37 in	
	Y (25 Units)	0.13 in	0.37 in	
	+ (25 Units)	0.13 in	0.37 in	
	- (25 Units)	0.13 in	0.37 in	
Drosophila Olfactory Operant Conditioning				
	Drosophila			
Drosophila Shallow Chamber				
	Group Chamber, d=13cm			
	Courtship, d=7cm			
Drosophila Y Maze		Sets	Units	
		10	100	
Elevated Plus Maze		Arm Length	Arm Width	Wall Height
		35	5	20
	Mouse	50	10	30
	Rat	Cylinder		
Emergence Test				
	Mouse			
	Rat	21 x 7 x 7		
Escape Hole Radial Arm Maze		Arm Length	Arm Width	Acrylic box Length
	Mouse	35	11	15
	Rat	55	15	23
		Length	Width	Height
Fear Conditioning		17	17	25
	Mouse	17	17	25
	Rat			
	Mouse Set of 2			
	Rat Set of 2			
	Mouse Set of 4			
	Rat Set of 4			
Forced Swim Tail Suspension Combination		Diameter	Height	
	Mouse	20	40	
	Rat	25	45	
	Large rat	30	60	
Forced Swim Test		Diameter	Height	
		20	40	
	Mouse	25	45	
	Rat	30	60	
	Rat	Start area	Testing area	
		5 in x 8 in	7 in x 8 in	
FTIR Walkway		6 in x 10 in	9 in x 10 in	Chamber Length
	Mouse	Platform Dimensions	Thickness	12 in
	Rat	35 x 35		15 in
Geotaxis Test		50 x 50		
		35 x 35		
	Mouse metal	50 x 50		
	rat metal	Dimensions		
	Mouse acrylic	60 x 60	½ in	
	Rat acrylic	100 x 100	½ in	
		60 x 60	Width	
Hairpin Maze		100 x 100	6	
	Mouse (Static Model)		10	
	Rat (Static Model)		6	
	Mouse (Removable)		10	
	Rat (Removable)			
Hebb Williams				
	Mouse			
	Rat			
Hole Board		Length	Width	Height
	Mouse	40	40	35
	Rat	60	60	45
Horizontal Ladder		Wall Height	Length	Thickness
	Mouse	15	60	3/8 in
	Rat	20	100	3/8 in
IDED Operant Chamber		Dimentions		
	Mouse	16 x 16 x 16		
	Rat	21 x 21 x 21		
Lashley III		Arm Length	Height	Width
		45	7	5
	Mouse	60	10	8
	Rat	Length	Width	Height
Learned Helplessness		17	17	20
	Mouse	22	22	20
	Rat			
Lickometers				
	Adjustable Height			
	Fiber Optic Feedback Sensor			

				2780	
				2780	
				2780	
				2780	
				4900	
				1890	
				1590	
				990	
Stand Height	Edge Bumper				
61	1			1890	200
61	1			1990	250
				790	
				890	
Acrylic box Width	Acrylic box Height				
7	6			3890	
11	9.5			3990	
				11800	
				11900	
				16900	
				17900	
				29900	
				30900	
				1490	
				1690	
				1890	
				690	
				890	
				1190	
Chamber Width	Chamber Height	Cups Diameter	Cups Height		
8 in	7 in	2.5 in	1.5 in	2300	
10 in	9 in	2.5 in	1.5 in	2400	
				1490	
				1790	
				890	
				990	
				1800	
				1900	
				2200	
				2300	
				2290	200
				2890	300
Diameter Holes					
3				1495	100
5				1790	150
Bars Length	Bar Diameter				
10 cm to accommodate 8 cm width of ladder	0.3			1490	
15 cm to accommodate 13 cm width of ladder	0.3			1590	
				8900	
				9900	
Doors	Goal Box	Start Box			
4 x 4	19.5 x 7 x 5	8 x 9.5 x 7		1890	
6 x 6	26 x 9 x 6	10 x 12 x 9		1990	
				3900	
				4900	
				1250	200
				500	

Light Dark Box				
	Mouse			
	Rat			
Mammalian Diving Response Apparatus		Length	Width	Height
	Mouse	67	40	10
	Rat	100	60	15
Mirror Chamber		Total Chamber Length	Total Chamber Width	Total Chamber Height
	Mouse	40	40	30.5
	Rat	66	66	50
Mirror Chamber Version 2		Small Box Length	Small Box Width	Small Box Height
	Mouse	28	28	28
	Rat	42	42	42
Morris Water Maze		Diameter	Height	
	Mouse 4ft	120	40	
	Mouse 5ft	155	90	
	Rat			
Morris Water Maze Float Platform				
	Mouse			
	Rat			
Morris Water Maze Release Device		Diameter	Height	
	Mouse	10	25	
	Rat	15	35	
Multivariate Concentric Square Field Test		Open Field	Outer Wall	Center
	Mouse	72 x 72	28	42 x 42
	Rat	95 x 95	36	55 x 55
Novel Object Recognition		Length	Width	Height
	Mouse	40	40	30
	Rat	60	60	40
	XS (Stroke)	25	25	25
	Mouse (Set of 4)			
	Rat (Set of 4)			
	XS (Stroke - Set of 4)			
Novel Object Recognition Asssay		Diameter	Height	Width
	Mouse	180	26	30
	Rat	270	40	45
Open Field		Length	Width	Height
	Mouse	40	40	30
	Rat	60	60	40
	XS (Stroke)	25	25	25
	Mouse (Set of 4)			
	Rat (Set of 4)			
	XS (Stroke - Set of 4)			
Parallel Bars		Bar Length	Bar Width	Height
	Mouse	1 m	4 mm	60 cm
	Rat	1 m	4 mm	60 cm
Parallel Rod Test		Width	Length	Height
	Mouse	15	15	20
	Rat	22.5	22.5	30
	Mouse Set of 4	15	15	20
	Rat Set of 4	22.5	22.5	30
		Diameter	Stand	
Patterned Barnes Maze		92	95	
	Mouse	122	95	Escape Tube Inner Diameter
	Rat	Start Zone Length	Start Zone Width	40
Puzzle Box		58	28	52
	Mouse	87	42	Start Zone Height
	Rat	Arm Length	Arm Width	27.5
Radial Arm Maze		35	5	41.5
	Mouse		10	Wall Height
	Rat		Height	10
Repeated Acquisition And Performance Chamber			30	20
	Mouse		45	Length
	Rat		Width	40
Resident Intruder		Total Length	19	60
	Mouse	90	38	Height
	Rat	135	Fall Height	7
Rotarod		Length	16	14
	Mouse 3 Lane	11	16	Rod Diameter
	Rat 3 Lane	21	16	3
	Mouse 6 Lane	Lane Width	16	9
	Rat 6 Lane	6		3
		12		9
		6		
		12		

				1190	
				1290	
Individual channels	Lane Width	Length of Channel			
5	8	67		3890	
5	11	100		3990	
Alleyway Length	Alleyway Width	Alleyway Height			
40	9.5	30.5		1590	
66	16	50		1790	
Large Box Length	Large Box Width	Large Box Height			
38	38	29			
57	57	43.2		1590	
				1790	
				1390	
				1490	
				1590	
				890	
				990	
				690	
				990	
				3800	
				4800	
				490	100
				590	150
				440	80
				1790	300
				1890	400
				1590	150
Door Width	Door Height				
6	6			1290	
10	10			1390	
				490	100
				590	150
				440	80
				1790	300
				1890	400
				1590	150
				990	
				990	
Rods					
1.6				790	
1.9				890	
1.6				2190	
1.9				2290	
Escape Tube Outer Diameter	Total Holes	Hole Diameter			
45	40	5		3890	
60	40	10		3990	
Dark Zone Length	Dark Zone Width	Dark Zone Height			
15	28	27.5			
22	42	41.5		1695	
				1795	
				1890	
				1990	
Door Width					
8				7990	
12				8990	
				1890	
				4495	
				4995	
				4995	
				5995	

Self Administration Runway		Start box Length	Start box Width	Start box Height
	Mouse	15	15	20
	Rat	20	20	26
Skilled Forelimb Test		Height	Length	Width
	Mouse	20	23	10
	Rat	30	35	15
Sociability Chamber		Total Cage Size	Round Wire Cage Diameter	Round Wire Cage Height
	Mouse	40.5 x 60 x 22	10	20
	Rat	40.5 x 80 x 40	15	30
Social Defeat Apparatus		Total Arena Width	Total Arena Length	Total Arena Height
	Mouse	42	42	42
	Rat	68	68	68
Social Reward Chamber		Length	Width	Height
	Mouse	33	22	20
	Rat	50	33	30
Spatial Reorientation		Rectangular Arena	Square Arena	Black Box
	Mouse	40 x 80 x 20	40 x 40 x 20	8 x 8 x 12
	Rat	60 x 120 x 30	60 x 60 x 30	12 x 12 x 18
Static Rods		Rod 1	Rod 2	Rod 3
	Mouse	35mm, 60 cm length	28mm, 60 cm length	22mm, 60 cm length
	Rat	35mm, 60 cm length	28mm, 60 cm length	22mm, 60 cm length
Step Down Avoidance		Length	Width	Height
	Mouse	28	23	26
	Rat	42	35	39
Stress Alternatives Model Maze		Length	Width	Height
	Mouse	91	22	26
	Rat	121	30	35
Successive Alleys		Alleys Width	Alley 1 Wall height	Alley 2 Wall height
	Mouse	8.5; 8.5; 3.5; 1.2	25	5
	Rat	9; 9; 6.7; 3.5	29	2,5
T Maze		Across the T	Stem Length	Arm Length
	Mouse	76	35	35
	Rat	95	72	
Tilt Ladder		116	82	
	Small Mouse	Length	Bar Length	
	Mouse	60	10	
	Rat	65	15	
Treadmill		Individual lane size	Size of Shock Grid	
	Mouse Single	44 x 6 x 12.7	12x 6	
	Rat Single	44 x 12 x 12.7	12 x 12	
	Mouse Double	44 x 6 x 12.7	12x 6	Bar Diameter
	Rat Double	44 x 12 x 12.7	12 x 12	0.3
	Mouse 5 Lane	44 x 6 x 12.7	12x 6	0.3
	Rat 5 Lane	44 x 12 x 12.7	12 x 12	
Triple Horizontal Bars		Rod Diameter	Rod Length	
	Mouse	2, 4 and 6 mm	8	
	Rat	2, 4 and 6 mm	8	
Tube Dominance Test		Length	Diameter	
	Mouse	30	3.5	
	Rat	48	5.5	
Two Problem T Maze		Stem Narrow Base Width	Stem Narrow Base Length	
	Mouse	6.5	19.5	
	Rat	10	30	
Y Maze		Arm Width	Arm Length	Rod holder
	Mouse	5	35	50
	Rat	10	50	50
Zebrafish 3 Chamber Choice		Width	Length	Entry to Door
	Zebrafish	22	44	13
Zebrafish 5 Choice		Length	Length From Start area	20
	5 Choice Chamber	36	21	Wide Stem Width
	Automated Feeder			13
	External Tank			20
Zebrafish Associative Learning		49		Arm Height
	Zebrafish	Acrylic Chamber size	Start Chambers	20
Zebrafish Bifurcating T Maze		60 x 47 x 25	15 x 10.5 x 25	15 x 10.5 x 25
	Zebrafish	Starting zone	Long Arm	Short Arms
Zebrafish Bite Test		30 x 10	50 x 10	20 x 10
	Bite Test Chamber	Length	Width	Height
	With Home Chamber	15	12	3.5
Zebrafish Larvae T Maze		15	12	3.5
	Zebrafish	Start Arm Length	Arm corridors Length	Arm corridors Width
		50mm	25mm	5mm

Goal Box Length	Goal Box Width	Goal Box Height			
15	15	20			
20	20	26		1500	
Gap				1600	
0.5					
				1390	
1				1490	
				1990	
				2490	
Divider Width	Divider Depth	Divider Height			
0.5	42	15		2390	
0.5	68	25		2490	
Door Length	Door Width	Door Height			
7	5	5			
10	7.5	7.5		1790	
				1990	
				1490	
				1590	
Rod 4	Rod 5				
15mm, 60 cm length	9mm, 60 cm length			990	
15mm, 60 cm length	9mm, 60 cm length			990	
				7900	
				89	
Opaque Cylinder Diameter	Opaque Cylinder Height				
16	22			1790	
21	30			1990	
Alley 3 Wall height	Alley 4 Wall height				
0.8	0.2				
0.5	0.3			890	
Width	Wall Height			990	
6	20				
10	20			1090	250
18	30			1190	300
Internal Height				1390	350
5					
6					
				1800	
				1900	
				5490	
				5990	
				6490	
				6990	
				6990	
				7990	
				990	
				990	
Distance between doors					
4				790	
8				890	
Wide Stem Length					
40	Total T length	Total T width			
60	6.5	65		1890	
	100	10		1990	
				1195	
				1395	
Middle chamber Width	Middle chamber Length	Door Height	Door Width		
22	18	12	10	1990	
Width	Height				
				5990	
				990	
42	15			1290	
Open Compartment					
60 x 25 x 25				2900	
Removable opaque partitions	Deep water chambers				
4.5 x 30	30 x 30			2900	
Opening	Chamber				
3				690	
3	30 x 30 x 10			1690	
Arm corridors Depth	Arm corridors Intersection	Pool size			
10mm	25mm	1955mm		1390	

Zebrafish Place Preference Test		Length	Width	Height
	Zebrafish	52	17	23
Zebrafish Rotation Test		Rotation from 0-20rpm	Center post diameter 3	Main Rotating Chamber Diameter
	Zebrafish	Length	Width	10
Zebrafish T Maze				Height
	T Maze (Cross)	70	50	10
	T Maze (Symmetrical)	50	50	10
Zebrafish Tap Test		Number of Arenas	Diameter	Height
	Zebrafish	2×4 array	6	9
Zebrafish Vertical Tank Array		Height	Length at top	Width at top
	3 Tank Array	15	30	7
	6 Tank Array	15	30	7
Zebrafish Y Maze		Length	Width	Height
	Zebrafish	25	8	15
Zero Maze		Diameter	Track Width	Wall Height
	Mouse	50	5	20
	Rat	100	10	30
Ziggurat Task		Individual White Ziggurats	Individual Black Ziggurats	Ziggurat Chamber
	Mouse	19 x 19 x13	19 x 19 x13	110 x 110 x 15
	Rat	31 x 31 x 21	31 x 31 x 21	180 x 180 x 25

Middle section width					
8.5				1390	
Rotating drum Diameter					
15					
				3990	
				1390	
				1390	
Separators Height					
12				4990	
Length at bottom	Width at bottom				
23	6			1990	
23	6			2990	
				1090	
Stand Height					
61				1890	200
61				2090	300
				1890	
				1990	

Engineering

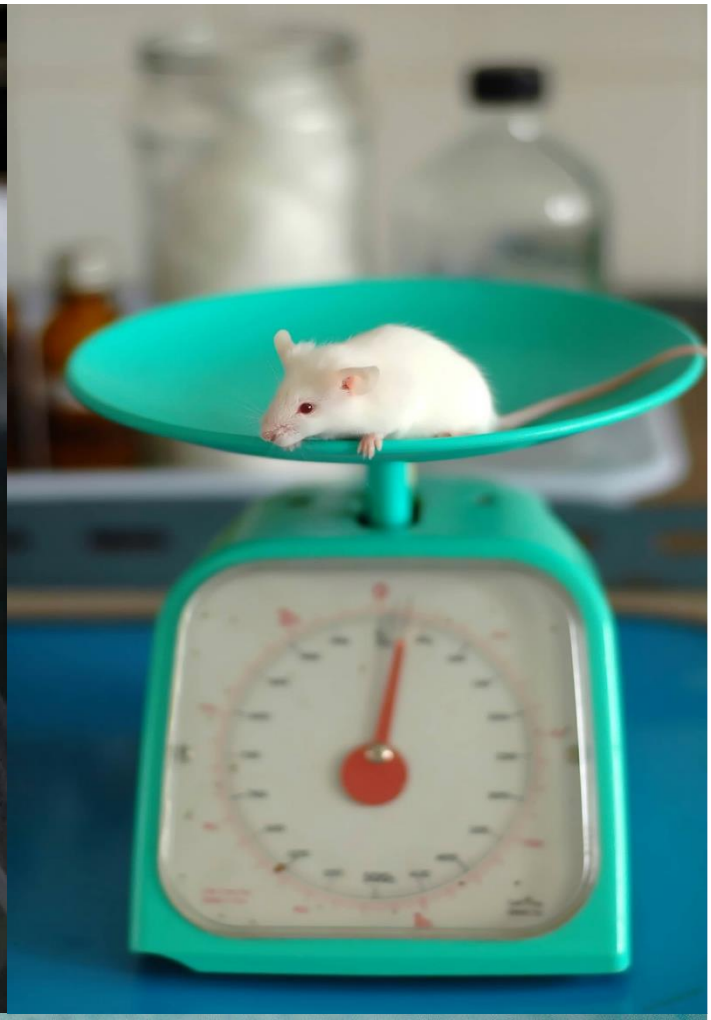
This team handles both physical construction of mazes, automation, and customization for protocol design. Our materials design and detection work allows for quality construction for accurate and precise data collection of murine and rodent behavior. This data is transmitted to software over various modalities including RF, Bluetooth, or custom to your needs. We can install treadmills, automated feeders, and other hardware for rich environmental interaction for your mice.

Biological Sciences division

Works tirelessly to ensure that the maze being constructed adheres to established scientifi c protocols. Factors such as odor cues, acrylic distractions, extramazal externalities, are all part of the calculus when creating a well-designed maze. This is also the team that will test the apparatus in our corporate laboratory to ensure adherence to scientifi c integrity prior to shipping.

Software

Integrates all these elements into an easy to use user interface for simplistic organization of what can often be large amounts of raw data. This data can be easily sorted, curated, and organized for your needs, and we can implement advanced analytics to sort the high volume data.



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