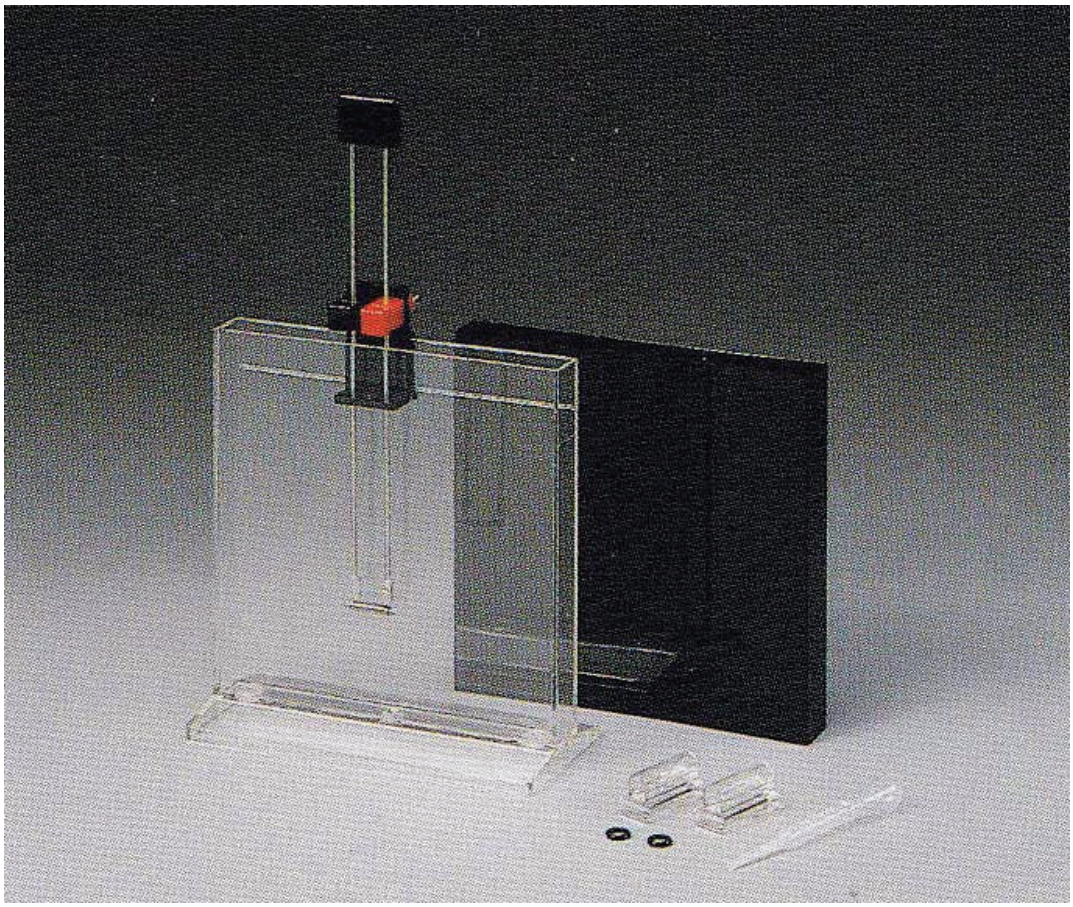
MIRUSOU TRANSPARENT TANK

N99-G40-4340



Mirusou is a narrow tank constructed from acrylic resin designed to allow convenient observation of objects within the tank. The tank is ideal for group study since objects can be completely examined through all sides. One side of the tank is gridded into 1-cm squares to assist in determining the approximate size and placement of objects under observation within the tank. A wide range of experiments are possible.

SPECIFICATIONS

Mirusou tank:	Transparent acrylic resin, 154mm x 160mm x 20mm (L x W x H)

ACCESSORIES

Heater:	42mm x 28mm x 205m (L x W x H) Vertically adjustable up to approx. 120mm Approximate resistance: 6 ohms
Thermometer holder:	Polycarbonate resin, set of 2
0-ring:	Inside diameter: 6mm, set of 2
Mirusou cover:	Black vinyl chloride
Syringe:	Polyethylene, 1-ml graduations

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Manual of Operations

IMPORTANT!

Read the following before using this equipment:

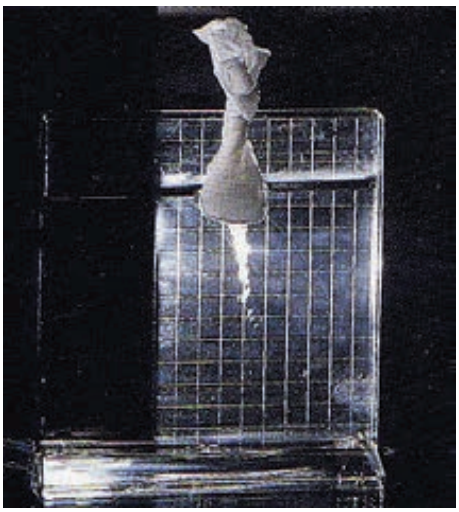
Carefully follow all instructions and observe all precautions given in this manual

EXPERIMENTAL PROCEDURE

1. **Observation of an Ant Nest**
   Fill the tank with dirt. Place ants and sugar into the tank and place the cover on top. To prevent the ants from escaping, cover the top of the tank with a thin cloth or netting secured in place with a rubber band. Be careful not to obscure the view of the sides of the tank any more than necessary. (Use of transparent plastic wrap with small holes is ideal.) While the ants seem to move around aimlessly at first, they will begin to construct a nest overnight. Uncover the Mirusou and observe the progess of the ant nest.
   Note: To collect ants, place sugar around an ant nest to attract them to gather away from the nest.

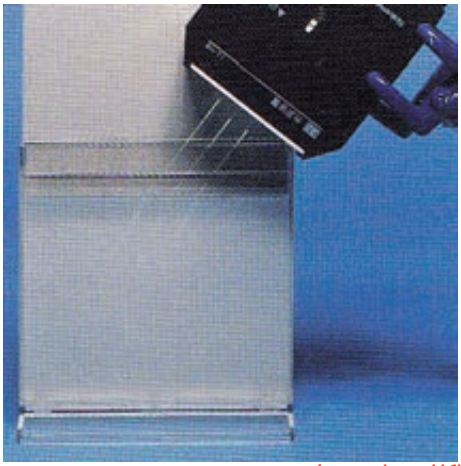
2. **Observation of the dissolution of salt or sugar**
   Wrap a spoonful of salt or sugar in tissue paper and immerse it in the upper part of the Mirusou, which has been filled with warm water. The crystals will immediately begin to dissolve with the resulting solution settling toward the bottom of the tank. It is best to tie the bundle closed with a string and then wrap cellophane tape around the string.

Note: Since the Mirusou is constructed from acrylic resin, do not use water hotter than 80^{oC}



3. **Observation of medaka (cyprinodont) eggs**
   Young medaka (cyprinodont) are eaten by their parents if they are kept in the same tank. Use the Mirusou to observe the development of the young medaka. As the eggs hatch, carefully remove the water plants on which the eggs are attached and place them inside the Mirusou. The eggs may be examined from two sides using a magnifying glass. For this observation, place the Mirusou in the same tank as the parent fish so that the water is maintained at the same temperature. An alternative method is to prepare a sheet of transparents plastic wrap as a netting material, cut to fit inside the Mirusou. Gather the eggs inside the plastic wrap net. Fill the Mirusou with water from the tank and place the net into the Mirusou. It is easy to follow and note the development of individual eggs as they will remain in the same relative position until they hatch. Medaka eggs hatch in 10-15 days.

4. **Examination of medaka (cyprinodont)**
   Put a male and a female medaka into the Mirusou and examine them from both sides of the tank. Since the tank is narrow enough to prevent them from turning within tank, they will always swim in one direction. It is easy to observe the distinctive featues of the male and female fish at close range (dorsal and anal fins) as well as the difference in their sizes.

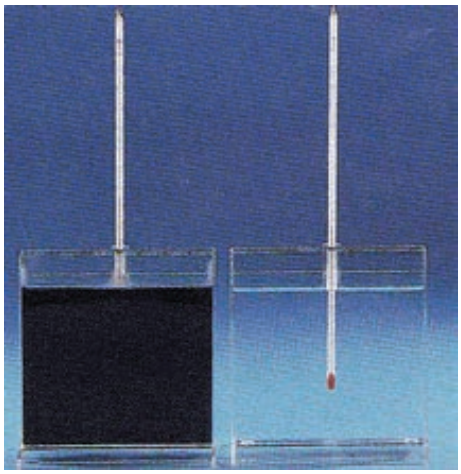


5. **Observe refraction of light**
   Fill the Mirusou with water and direct parallel beams of light through slits into the tank.

6. **How objects are warmed**

   1- Experiment using the Mirusou cover (warming air). Fill two Mirusou's with water and use cover one of the tanks with provided black shield. Place a thermometer holder in the middle of each Mirusou and cover the top with transparent plastic wrap. Then attach O-rings to two thermometers and mount one in each of the holders. (Insert the thermometer through the plastic wrap.) Leave the tanks exposed to sunslight and observe the comparative difference in the temperature rise between the two tanks.

   2- Experiment using ink (warming water). Fill one Mirusou with water and the other Mirusou with inked water. Place a thermometer holder and a thermometer in each tank and place them in sunlight. Observe the comparative difference in the temperature rise between the two tanks. (Transparent plastic wrap is not used in this experiment).

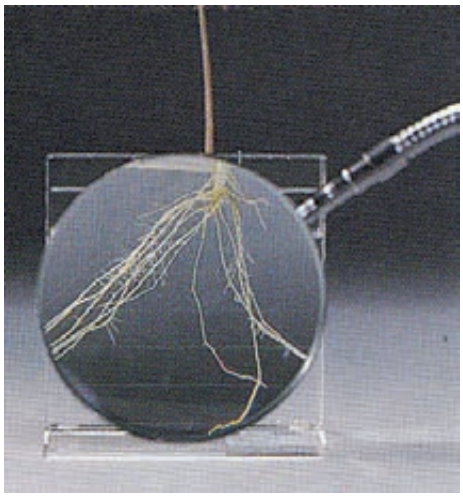


7. **Observation of hair roots**

   Place soil in Mirusou and plant balsam seeds inside the tank. Use the Mirusou cover to facilitate the development of roots. Remove the cover daily or every other day to observe the growth of roots Note the condition of the roots, their length, and the condition of hair roots along the wall of the Mirusou.

Note: If the Mirusou is placed at an angle, the hair roots will grow along the wall of the tank.

Note: Since there is no drain at the bottom of the tank, be careful to note the amount of water in the tank when the cover is removed.



8. **Experiment involving water currents**

   • Fill the Mirusou with water and set the heater stand inside the tank

   •Install a nichrome wire in the middle of the heater unit. While pushing the red and black buttons at the same time, as shown in the picture to the right, move the heating unit up and down.

   •Prepare two thermometer holders. Attach O-rings to two 0-100oC thermometers and mount them in the holders. Place the bulb of one thermometer beneath the heater and the bulb of the second thermometer above the heater.

   • Attach the heater to a 12V,1A power supply and turn on the power to heat the water around the heating unit. The water around the heating element can be seen to move.

   • Fill a dropper or a pipette with ink and place one drop at the level of the heating element. As the drop dissipates, the dyed water can be seen to rise and disperse (the occurrence of a current).

   • By successively placing additional drops of ink into the water, the upper portion will progressively darken, while the lower portion remains clear, creating two distinct layers of water within the tank.