

## Small Mammals

Mammals got their start millions of years ago, long before the extinction of the great dinosaurs. Then, as the dinosaurs declined, mammals proliferated and the Age of Mammals was underway. Many kinds of mammals have evolved through the millenniums, but most of them have become extinct. Today's mammals represent the top of the evolutionary line, the highest forms of life that have ever lived on earth.

### **Characteristics**

Like other groups of animals, mammals range in size from a tiny shrew less than 2 inches long and weighing one fifth of an ounce to the 150-ton blue whale, which can reach lengths of over 100 feet and is probably the largest animal that has ever lived. Mammals have adapted to a variety of lifestyles. There are burrowing, running, jumping, climbing, flying and swimming mammals. They can be *carnivorous* (meat-eating), *herbivorous* (plant-eating), or *omnivorous* (both meat and plant-eating). They can be *diurnal* (active during the day), *nocturnal* (active at night), or *crepuscular* (active at dawn or dusk). They can be predators or prey.

Consistent with this great diversity, there are only a few characteristics that are distinctly mammalian. One of these is that mammals are the only animals that have hair. Their most outstanding characteristic is that they are the only animals that suckle their young-feed milk from mammary glands of the mother. This is their hallmark and origin of the name of the group.

### **Reproduction**

Another characteristic of interest is the mammals' method of reproduction. All mammals have internal fertilization, that is, the eggs are fertilized inside the mother. The typical pattern is that the eggs then become implanted in the uterus where the developing offspring are nourished through the placenta. The gestation period and the level of maturity of the newborns depend on the species involved. A notable exception to this pattern is found in mammals with pouches, such as kangaroos and opossums. After fertilization, the eggs develop in the uterus for a short time; then the young are born at an extremely immature stage. They crawl through the mother's hair, enter the pouch, and attached themselves to a mammary gland for several weeks of continued development. Another notable exception is found in the monotremes-duckbilled platypus and the spiny anteater, both of Australia. Following fertilization in both of these unusual mammals, a shell forms around the embryo, just as in birds. The eggs are then laid and incubated in an underground burrow by the platypus and in the marsupial-like pouch by the anteater. After they hatch they feed on their mother's milk.

A characteristic that mammals share with birds is that they are endothermic (warm-blooded). The ability to maintain a constant body temperature helps make mammals the active animals that they are, but there are exceptions even to this. Certain mammals, such as woodchucks and ground squirrels, are able to avoid the rigors of winter by hibernating-lowering their body temperature, thus reducing their energy consumption and the need to feed on a regular basis.

## **Selecting Mammals for the Classroom**

### **Recommended Mammals**

Several kinds of mammals can be kept successfully in the classroom, but only a few are recommended. These are laboratory, or white mice; laboratory rats; gerbils; hamsters; guinea pigs; and domestic rabbits. All of these are descendants of wild stock, but they have been domesticated for thousands of generations and can be safely handled. They can be cared for with relative ease, are generally free of disease, are adapted to living in the confines of a cage, and seem to adjust well to classroom conditions.

## **Small Mammals (cont)**

Because of their popularity, all of them are likely to be available from local sources—either a pet store or a private individual (Region 20, Living Science Materials Center).

Not all mammals can adapt to classroom conditions, and many that will survive require an inordinate amount of attention and care or are unsuitable for other reasons. Wild mammals should not be kept in the classroom. Their instinctive behavior is oriented toward survival. Responses such as aggression, defense, or escape can be triggered unintentionally by a touch, loud noise, or a quick movement. They are also known to carry disease that can be transmitted to humans.

Like other animals, small mammals have varying degrees of vulnerability to disease. Hamsters and gerbils seem to be relatively free from disease problems. Mice and rats though are more susceptible to respiratory diseases. Starting with healthy animals, keeping them in clean, dry, un-crowded, draft-free cages, and providing a proper diet can usually prevent these problems. However, if an animal shows signs of problems, as indicated by loss of appetite, weight loss, breathing difficulty, or change in behavior, it should be isolated from other animals and removed from the classroom until its conditions improves.

### **A Special Note on Animal Reproduction**

All the mammals described for the classroom have very high reproductive capacities, and all reproduce readily in captivity. However, classroom animals should not be allowed to reproduce more than is necessary to achieve the goals of the project. Unwanted animals cause problems because they need additional facilities and care and will eventually need appropriate homes.

The way to prevent an over population problem from rising is simple and applies to all animals—separate the males and females. Animals can be kept without reproducing by selecting two of the same sex—preferably females, as they usually make more compatible cage mates than males. Alternatively, a single animal can be kept. If reproduction is necessary to achieve a project goal then it should be limited to only that which is necessary. This can be accomplished by separating the adults before the female gives birth to prevent them from mating again and by separating the juvenile males and females before the onset of maturity.

*Before breeding any animals, be sure you have the appropriate homes available for the offspring.*

### **Housing**

Small mammals (rats, mice, gerbils, hamsters) can be kept in a variety of cages, including a commercial rodent cage or a 10-gallon aquarium with a secure screen cover. The floor should be covered with at least one inch or more of wood shavings or commercial pet litter (newspaper or cedar shavings should not be used). This will absorb moisture, help eliminate odor and facilitate the cleaning of the cage. Two or three shredded paper towels should be placed in the cage to provide nesting material. An activity wheel, while not really necessary for their health, will be utilized by the mammals and add dimension of interest for the students. In addition, a piece of wood placed in the cage will give the mammals an opportunity to gnaw if they choose to do so.

### **Diet**

Rodent chow can be purchased from your local pet store and will be a sufficient diet for you classroom pet. Sometimes the chow can be supplemented with birdseed and occasional pieces of vegetable material such as carrots or lettuce. Whatever food is provided, at least some of it should be available at all times so that the mammals can eat at will. It is best to suspend the food in a wire basket to prevent it from becoming fouled, but if it is necessary to feed from a dish, a smaller amount should be offered. Because of the likelihood of contamination, any leftover food in the dish should be discarded and replaced each day.

## Small Mammals (cont)

Drinking water should also be available on a continual basis. Although their water consumption is minimal, they will usually drink at least some water each day, and the only practical way to provide it is with an inverted water bottle, which should be rinsed and refilled with fresh water frequently. If left with sufficient quantities of food and water the mammals can be left over weekends without further attention. For longer periods, some arrangements will need to be made for the animals' care.

### **A Note on Handling**

The more the mammals are in the presence of humans, the tamer they will become and the more easily they can be handled. When they appear calm, they can be picked up by gently cupping both hands around them. Care should be taken not to squeeze them or confine them too tightly, though, as they might become uncomfortable and attempt to bite. At the same time, they should be confined sufficiently to prevent them from jumping or falling. Juvenile mammals especially have no apparent knowledge or fear of heights and, if not controlled, will jump out of the hands and injure themselves.

### **Basic Care**

Keep the cage out of direct sunlight and avoid drafts and sudden temperature changes. Be sure to wash hands before and after handling and caging and animals. Rinse and refill water bottles with fresh water, add more food to the food basket and check bedding on a daily basis. The bedding should be changed at least three times a week, mostly to eliminate the odor and to keep bacteria from forming in the cage.

### **A Sample Schedule**

<b>Monday</b>	Fill food bowl Empty, rinse and refill water bottle Change litter
<b>Tuesday</b>	Empty and rinse water bottle
<b>Wednesday</b>	Scrub food bowl and fill with fresh chow Empty, rinse and refill water bottle
<b>Thursday</b>	Fill bowl with food Empty, rinse and refill water bottle Change litter
<b>Friday</b>	Fill food bowl Clean water bottle with hot soapy water, rinse and refill

### **Rats**

Rats are sexually mature by 100 days of age and the females are in estrus every 5 days. The pregnancy could last 20 to 22 days. The blind and hairless newborns grow quickly and are weaned in 3 weeks. **DO NOT** change the liter or touch the young during this time.

### **Mice**

Mice are sexually mature by 5 weeks of age and the females begin going into heat every 4 or 5 days. The pregnancy could last 19 to 21 days after which a litter of 10 to 12 hairless and blind babies are born. The young are weaned at 3 weeks. The mother may eat her young if they are handled before their eyes are open. **DO NOT** return the mice to the Region 20, Living Science Materials Center until they are weaned and then call before they are returned. Students or other teachers may adopt them.

**Small Mammals (cont)****Gerbils**

Gerbils are strictly monogamous. Young are born 23 days after mating. They are 3 weeks old before they open their eyes and are weaned a week later. The male is a helpful father and can remain with the young. DO NOT change bedding or disturb the gerbils for the first 2 weeks following the birth. DO NOT return gerbils to the Region 20, Living Science Materials Center, until they are weaned and then call before they are returned, or other teachers could adopt them.

**Hamsters**

Hamsters may have a litter 16 to 18 days after mating. Litter size ranges from 6 to 12 babies. Babies' eyes open at 10 days and are weaned at 21 days. DO NOT change bedding for first week after birth. DO NOT return hamsters to Region 20, Living Science Materials Center, until they are weaned and then call before they are returned, or other teachers could adopt them.