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HOW LONG IS A SNAIL'S PACE?

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For a change of pace, you and your students may find the study of land snails a stimulating adventure. Strange as it may seem, many students find pet snails amazing and loveable. Snails provide excellent opportunities for observation, experimentation and other process studies as well as providing a wealth of content concerning an animal from one of the lower phyla. And, a snail's pace is an example of one of life's great virtues -- patience.

How long is a snail's pace? Considering that a snail is one foot, or has one foot, the answer must be Surely not, but finding the pace (i.e. speed of a snail) is an excellent problem with which to begin a study of snails.

It is true that the main body of the snail is a muscle called the foot, and each snail has only one such muscle. Having only one foot makes it most difficult for the snail to pace as do people and horses, but what an interesting track a snail leaves! Suggest to your students that they allow land snails to crawl over colored construction paper, sand paper, a sheet of glass or plastic and try to find out as much as they can about the tracks that snails leave and the surface which they prefer. Do snails move faster over a wet surface or a dry surface? A rough surface or a smooth surface? Data on a snail's pace will provide an excellent data gathering exercise.

Snails must be handled with great care so that their shells are not broken. Snails which are dropped and have a broken shell usually do not live long. Once students have learned to handle them with care and have learned quite a bit about snail locomotion, they may want to explore snail acrobatics. Snails are good tight rope walkers. Tie a string on two sticks and arrange them similar to Figure 1. What is a snail's pace on a tight rope?

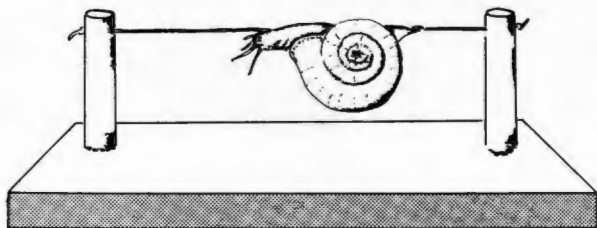


Figure 1

What do land snails eat? Your students will want to explore this. They will find that land snails eat plant material of various sorts. Be sure to try lettuce and dry cereals. Where do snails get the calcium needed for their shells? Do they drink milk? Better try some egg shell, bone or bone meal. How do snails find their food? They have eyes on the ends of the long "feelers" and so can look over things. But eyes are not very helpful in the dark. Do snails find food more readily at night or during the day? Your students will probably conclude that snails can find their food without being able to see it. The snail's sense of smell seems to be more important than sight in finding food.

Do snails drink water? This is a question which should be answered soon after the snails arrive. Remember that these are land snails and that they will drown in deep water.

Plastic shoe or sweater boxes make excellent snail homes. They will serve well when you decide to darken the boxes so that you can change the snails' day into night. That makes it much easier to observe their preference for day or night activity.

If land snails are collected in the local woods, students will be able to survey the area of collection and determine the ideal snail habitat. If land snails are purchased from a biological supply house, it will be necessary to read about their needs. Snails need a moist habitat. They will need moist soil for egg laying. A pot or plastic container of soil at least 2 cm deep is sufficient, but you may want to see if your snails like to spend time in a large area covered with deeper soil. Snails need a clean environment and old food must be removed. Rotting food will start bacterial growth which is often harmful to the snails.

Small land snails can often be collected in many woods in the Midwest. They may be found under leaves on the floor of the woods or up on vegetation. They have been found as high as 15 feet up in a tree. Midwest snail populations are usually controlled by rodents, birds and snakes which eat them. In California the large land snails do present a problem in gardens. There they are often abundant, large and easily collected. Snails collected in one habitat should never be released in another habitat in which they may have a chance for survival.

People do several things to affect the snail population. See how many your students can list before and after readings. If students read about snail problems in California, they will list some of the things done to eradicate snails. They may also think of the changes in natural habitats which destroy many different populations including the snails. They may also suggest that the popularity of escargot might be a factor. A library search concerning escargot will be productive. It will also provide an opportunity for a class party with a unique substitute for milk and cookies.

Although snails may be found to be loveable, they do not like to be squeezed by children. Snails like to be squeezed by each other, but that is another topic. If snails are held too tightly they will "foam up" or exude a sticky substance. This seems to be a protective device. Perhaps

it aids them in slipping out of a tight spot! How do snails respond if they are touched gently?

The long "feelers" are particularly interesting to touch. Remember that there are eyes on the ends of the long feelers and so a "touch on the feeler" is much like a "poke in the eye."

Another tactile experience with snails may be had by placing a thin film of honey on your hand and allowing a snail to graze on it. You can often feel the raspy tongue which scrapes up the honey.

Let's go back to the topic of snails squeezing each other. Snails often snuggle for one or two hours or may lock together for half a day. Each snail contains both sexes so every snail in the colony can be expected to lay eggs. The eggs which are laid in moist soil hatch in about two weeks. The time of hatching seems to be dependent on temperature and moisture. Your students will surely want to observe the baby snails with a hand lens. Although the young snails have a shell when they hatch, it is rather fragile. They are best picked up while on a piece of lettuce.

The better the children get to know their snail pets, the more questions they will find to explore and the better developed will become the "exploration phase" of the activity. From time to time you will want to assist them with bringing their ideas together. This has often been referred to as the "invention phase" of the learning cycle. The introduction of aquatic snails provides for an excellent "application phase." It is easier to carry out a more complete comparative study if larger aquatic snails are used. These may be purchased from a biological supply house. They, in turn, may be compared with the smaller pond snails which are easily collected.

The activities suggested do provide a wealth of opportunities for multidisciplinary studies. The measurements made and the data collected are the raw material for mathematics. Snails seem to be of little economic consequence in the Midwest, but they have a considerable negative impact in warm, produce-producing areas of California. They may also have a minor positive economic importance to grade school students in California who collect snails for a small price and send them to students in Iowa for study purposes. The architecture of snails shells provides an interesting subject for art. Language arts are practiced in many of the usual ways as observations are recorded and library books are read. Written student observations can be sent to the editor of the *Iowa Science Teachers Journal* and they will be considered for publication. Your students may become so emotionally involved with snails that they are prompted to write an "Ode to a Snail." As I read Comstock's *Handbook of Nature Study* (p. 421), I discovered that snails have indeed already been the impetus for a poem.

TO A SNAIL

Little Diogenes bearing your tub, whither away so gay,
With your eyes on stalks, and a foot that walks, tell me this I pray!
Is it an honest snail you seek that makes you go so slow,
And over the edges of all things peek? Have you found him, I want to
know,
Or do you go slow because you know, your house is near and tight?
And there is no hurry and surely no worry, lest you stay out late at
night.

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