Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# A Snail’s Pace

**Purpose**

Living organisms respond to a multitude of diverse ways to the environment. The specific responses depend on the type of stimuli which can be perceived as well as the structure and physiology of the animal itself. The purpose of this lab is to observe the common garden snail which will provide a specific example of an organism’s response to its environment.

The common garden snail of the Bay Area is an import from Europe where it is eaten with gusto (called escargots). In order to recall what you already might know about snails, answer the pre-lab questions. After observing the snail, come back to these questions to consider revisions, additions or continued confusion. [[1]](#endnote-1)

**Procedure**

**Materials**

1. Common garden snail
2. Ruler
3. Sandpaper

**C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmfSequence of Steps**

1. Answer the pre-lab questions.
2. C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmfAcquire 1 common garden snail. If your snail is inactive, place it briefly in a dish of cool water.
3. Take a few minutes to observe your snail. Record your observations.
4. C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmfInvestigation #1: Do snails move at different speeds over different types of surfaces? Write your hypothesis here: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Have your snail move over a plastic surface. Measure how far it moves in one minute. (centimeters/minute). DO this three times and record each distance in the chart below. Find the average.
6. Have your snail move over sandpaper and repeat the procedure above and record your results in the chart below. Find the average.
7. Repeat the procedure above on a third surface and record your results in Table 1. Find the average.
8. Investigation #2: Do different size snails move at different rates?Write your hypothesis here: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmfObtain 2 snails of different sizes.
10. Weigh and record the weights of each snail in Table 2.
11. C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmfMeasure the distance in centimeters that each snail travels in one minute on the same surface. Repeat this procedure three times and find an average of the differences for each snail. Record your results in Table 2.

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**Pre-lab Questions**

1. In what kinds of places would you expect to find snails?
2. Are snails more abundant in one season over another?
3. Are snails more active during certain times of the day and night?
4. During periods of their inactivity, where would you find them?
5. What kinds of food have you seen snails eating?

**Observations**

1. Describe your snail:
2. Where are the eyes located?
3. Where is the mouth?
4. Find the tentacles. What are their functions?
5. What happens when you gently touch the tentacles?
6. Place the snail on a piece of glass. How does it move?
7. Is there a slime trail?
8. What is the function of the slime trail?

**Table 1. Investigation #1*: Do snails move at different speeds over different types of surfaces?***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Surface Type | Trial #1 | Time | Distance Traveled | Rate of Movement |
| Glass | 1 |  |  |  |
| Glass | 2 |  |  |  |
| Glass | 3 |  |  |  |
|  | Average |  |  |  |
| Sandpaper | 1 |  |  |  |
| Sandpaper | 2 |  |  |  |
| Sandpaper | 3 |  |  |  |
|  | Average |  |  |  |
| Other | 1 |  |  |  |
| Other | 2 |  |  |  |
| Other | 3 |  |  |  |
|  | Average |  |  |  |

* Rate= Distance (centimeters)

Time (minutes)

Analyze your data and make a conclusion that would support or disprove your hypothesis:

**Table 2. Investigation #2: *Do different size snails move at different rates?***

**Snail #1 Snail #2**

**Weight: \_\_\_\_\_\_\_\_\_\_\_\_\_ Weight: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Trial #1 \_\_\_\_\_\_\_\_\_\_\_\_ cm/min \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm/min

Trial #2 \_\_\_\_\_\_\_\_\_\_\_\_ cm/min \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm/min

Trial #3 \_\_\_\_\_\_\_\_\_\_\_\_ cm/min \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm/min

Average: \_\_\_\_\_\_\_\_\_\_\_\_ cm/min \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm/min

**Results:**

Prepare a line graph for each snail on the graph below:

Analyze your data and make a conclusion which would support or disprove your hypothesis:

**Teacher Background Information: Snail Lab**

The Genus ***Helix*** belongs to the Family Helicidae. The most well known [species](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Species&curtab=2222_1&sbid=lc02b) are: ***Helix aspersa*** (Brown Garden Snail), ***Helix pomatia*** (Roman Snail, Burgundy Snail, or Edible Snail).

## Where snails are naturally found

Snails prefer cool, damp environments, as they easily suffer from moisture loss. Snails are most active at [night](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Night&curtab=2222_1&sbid=lc02b) and after [rainfall](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Precipitation+%28meteorology%29&curtab=2222_1&sbid=lc02b). During unfavorable conditions, a snail will remain inside its [shell](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Animal+shell&curtab=2222_1&sbid=lc02b), usually under [rocks](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Rock+%28geology%29&curtab=2222_1&sbid=lc02b) or other hiding places to avoid being discovered by [predators](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Predator&curtab=2222_1&sbid=lc02b). In dry [climates](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Climate&curtab=2222_1&sbid=lc02b) snails will naturally congregate near [water](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Water&curtab=2222_1&sbid=lc02b) sources, including artificial sources such as waste-water outlets of [air conditioners](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Air+conditioning&curtab=2222_1&sbid=lc02b).

## What snails eat and who eats snails

The common garden snail (*Helix aspersa*) is [herbivorous](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Herbivore&curtab=2222_1&sbid=lc02b). They are able to digest most vegetation such as [carrots](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Carrot&curtab=2222_1&sbid=lc02b) and [lettuce](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Lettuce&curtab=2222_1&sbid=lc02b). They also have a specialized crop of symbiotic [bacteria](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Bacteria&curtab=2222_1&sbid=lc02b) in their intestine which is used to digest [cellulose](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Cellulose&curtab=2222_1&sbid=lc02b).

There are many [predators](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Predator&curtab=2222_1&sbid=lc02b) that prey upon snails. Some animals such as the [song thrush](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Song+Thrush&curtab=2222_1&sbid=lc02b) break the shell of the snail by hammering it against a stone to get at its soft insides, some, like [frogs](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Frog&curtab=2222_1&sbid=lc02b), even eat the whole snail, shell and all. There are even some snails such as the [Decollate snail](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Decollate+snail&curtab=2222_1&sbid=lc02b) that prey upon other snails.

Many [Europeans](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Europe&curtab=2222_1&sbid=lc02b) enjoy eating snails. *Helix pomatia* is the one of the best known edible snails. In addition to the excellent taste of the snails, they have many [nutrients](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Nutrient&curtab=2222_1&sbid=lc02b) and are very rich in [calcium](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Calcium&curtab=2222_1&sbid=lc02b) and also contain [vitamin B1](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Thiamine&curtab=2222_1&sbid=lc02b) and [E](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Tocopherol&curtab=2222_1&sbid=lc02b). They also supply various kinds of essential [amino acids](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Amino+acid&curtab=2222_1&sbid=lc02b). Also, they are low in [calories](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Calorie&curtab=2222_1&sbid=lc02b) and [fat](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Fat&curtab=2222_1&sbid=lc02b).

## [Common snail (Helix aspersa)](http://www.answers.com/main/Record2?a=NR&url=http://commons.wikimedia.org/wiki/Image:Common%20snail.jpg)External features

Common snail (*Helix aspersa*)

In addition to the hard calcareous [shell](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Animal+shell&curtab=2222_1&sbid=lc02b) that covers and protects the internal organs, the head and foot region can be observed when the snails are fully extended. When they are active, the organs such as the [lung](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Lung&curtab=2222_1&sbid=lc02b), [heart](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Heart&curtab=2222_1&sbid=lc02b), [kidney](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Kidney&curtab=2222_1&sbid=lc02b) and [intestines](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Intestine&curtab=2222_1&sbid=lc02b) remain inside the shell, only the head and foot emerge.

The head of the snail has two pairs of tentacles, the upper and larger pair contain the [eyes](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Eye&curtab=2222_1&sbid=lc02b), the lower pair are used to feel the ground in front. The [mouth](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Mouth&curtab=2222_1&sbid=lc02b) is located just underneath the head. The tentacles can be withdrawn or extended depending on the situation. The mouth has unique [tongue](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Tongue&curtab=2222_1&sbid=lc02b) called a "[radula](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Radula&curtab=2222_1&sbid=lc02b)" that is composed of many fine chitinous [teeth](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Tooth&curtab=2222_1&sbid=lc02b). This serves for rasping and cutting food.

From April and throughout the summer, the number of snails [copulating](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Copulation&curtab=2222_1&sbid=lc02b) increases due to the high temperature and humidity which enhances the possibility of oviposition. The Pulmonate snails are [hermaphrodite](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Hermaphrodite&curtab=2222_1&sbid=lc02b), meaning that both [female](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Female&curtab=2222_1&sbid=lc02b) and [male](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Male&curtab=2222_1&sbid=lc02b) [sexual organs](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Sex+organ&curtab=2222_1&sbid=lc02b) are present in the same individual. The snails produce both [eggs](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Egg+%28biology%29&curtab=2222_1&sbid=lc02b) and [sperm](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Spermatozoon&curtab=2222_1&sbid=lc02b) in the ovotetis called the hermaphrodite gland, but it is later separated into two divisions, a sperm duct and [oviduct](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Oviduct&curtab=2222_1&sbid=lc02b), respectively.

[Mating](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Mating&curtab=2222_1&sbid=lc02b) takes several hours, sometimes a day. A few days later, the eggs are laid in the soil. They are usually 4-6 mm in diameter.

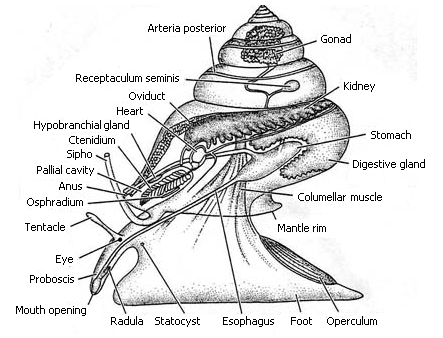
After snails are hatched from the egg, they mature through one or more years. It depends on where the organism lives. Maturity takes two years in Southern [California](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=California&curtab=2222_1&sbid=lc02b), while it takes only ten months in [South Africa](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=South+Africa&curtab=2222_1&sbid=lc02b).

The size of the adult snails slightly varies with species. *H. aspersa* grows up to 35 mm in height and width, whereas *H. pomatia* grows up to 45 mm. The life span of the snails in the wild is on average two or three years.

Some snails may live longer, perhaps even 30 years or older in the case of the Roman snail [[1]](http://www.weichtiere.at/Mollusks/Schnecken/weinberg.html) but most live less than 8 years. Many deaths are due to predators and [parasites](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Parasite&curtab=2222_1&sbid=lc02b).

## Respiration

[](http://www.answers.com/main/Record2?a=NR&url=http://commons.wikimedia.org/wiki/Image:Snail.jpg)Since snails in the Helix genus are terrestrial rather than fresh-water or marine, they have developed a simple lung for respiration. Many other snails that belong to the class Gastropoda have [gills](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Gill&curtab=2222_1&sbid=lc02b) instead.

[Oxygen](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Oxygen&curtab=2222_1&sbid=lc02b) is carried by the [blood](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Blood&curtab=2222_1&sbid=lc02b) pigment [hemocyanin](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Hemocyanin&curtab=2222_1&sbid=lc02b). Both oxygen and [carbon dioxide](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Carbon+dioxide&curtab=2222_1&sbid=lc02b) diffuse in and out of blood through the [capillaries](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Capillary&curtab=2222_1&sbid=lc02b). A [muscular](http://www.answers.com/main/ntquery;jsessionid=1wia8s6j7peop?method=4&dsid=2222&dekey=Muscle&curtab=2222_1&sbid=lc02b) valve regulates the process of opening and closing the entrance of the lung. When the valve opens, the air can either leave or come into the lung. The valve plays an important role in reducing water loss and preventing drowning.

1. (2008).Making Casts of Animal Tracks. *Prentice Hall, Inc.* [↑](#endnote-ref-1)