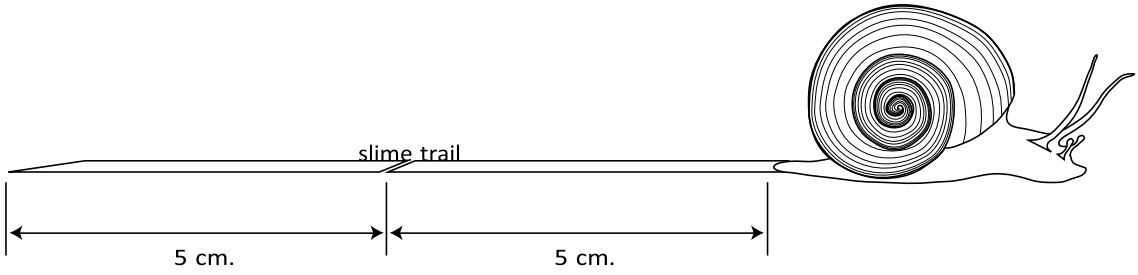
Name _____ Date_____ Class _____

Motion ▪ *Chapter Project*

Show Some Motion

Superman is faster than a speeding bullet, but is he as quick as lightning? Just how fast are these things? Have your parents ever accused you of moving like molasses or at a snail's pace? How slow is a snail?

Your goal is to measure the speeds of various things around your home. To measure an object's speed, you need to know how far it moves in a certain amount of time. The snail in the diagram below crawled for 2 minutes to leave the 10-cm slime trail. To calculate the snail's speed, divide the distance (10 cm) by the time (2 minutes) to get 5 cm/min (5 centimeters per minute).



Project Rules

- You must measure the speed of three items in the Speed Choice Menu on the next page. Pick one from each list. If you would like to measure the speed of something not on the lists, ask your teacher for approval.
- For each speed measured, prepare a display card that includes: a title; a diagram of your measurement method; a table of data collected; your step-by-step procedure for calculating speed; and the speeds you calculated.

Suggested Materials

- Things to measure
- Stopwatch or cell phone to measure time
- Variety of tools for measuring metric distances, such as a tape measure, ruler or long string with meters marked off
- Materials to make your display
- Calculator

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Speed Choice Menu

Appetizers	**Entrees**	**Desserts**
♦ you or a pet walking, running, crawling, or hopping	♦ a toy vehicle moving on a track or across the floor	♦ a point on the rim of your bicycle wheel
♦ a pebble falling in a glass of water	♦ the scent of candle moving across a room	♦ the tip of a minute or hour hand
♦ the speed of a baseball throw or soccer ball kick	♦ the rising water level in a container	♦ the speed of a spinning toy
♦ a falling feather, cotton ball, or snowflake?	♦ water moving through a hose	♦ the speed of a fan blade
♦ Your own idea (approved by teacher)	♦ Your own idea (approved by teacher)	♦ Your own circular idea (approved by teacher)

Project Hints

- Choose a measurement tool based on the distance to be measured. Use a ruler for short distances. Use a meter stick, tape measure, or rope to measure longer distances.
- Check your math with a calculator.

Project Timeline

Task	**Date Due**
1. Three speeds chosen.	Wednesday, 9/13
2. Measurement chart approved by teacher.	Thursday, 9/14
3. Procedure for one speed test	Friday, 9/15
4. Data collected for first measurement.	Monday, 9/18
5. Data collected for second and third measurement.	Tuesday, 9/19
6. Display cards completed – Project Due	**Thursday, 9/21**

Name _____ Date_____ Class _____

The Art of Measuring Speed

Measuring More Than Once

1. Keisha wanted to measure the running speed of her dog, Marvin. She marked off 20 meters in her backyard, told Marvin to stay at the starting point, and then positioned herself at the finish point with a stopwatch. She started the stopwatch and called Marvin. Keisha repeated the measurement three more times. Her four measurements were: 5.6 s, 4.3 s, 4.1 s, and 4.4 s.

a. Explain why the first measurement might be so different. Why is it a good idea to repeat a measurement several times?

_____

_____

_ **b.** The first measurement was over a second longer than the other three. Give reasons for including and for excluding the first measurement from the average.

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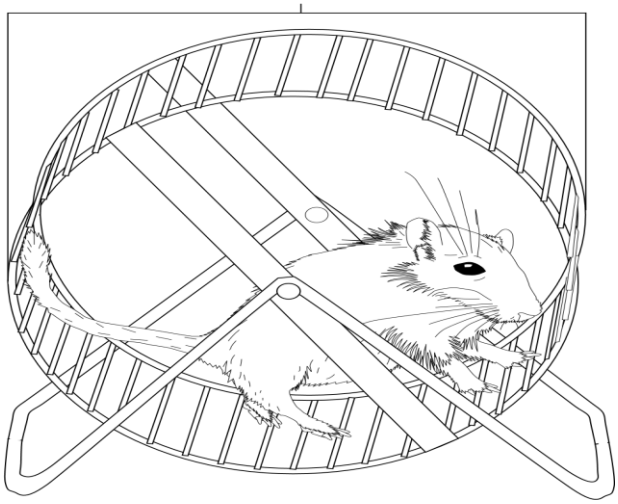
Measuring the Distance Around a Circle

2. Cara's gerbil Clancy was running in a treadmill. Cara remembered that the circumference of a circle is $\pi \times$ the diameter of the circle. ($\pi \approx 3.14$)

a. Calculate how far Clancy runs for each revolution of the treadmill.
Wheel diameter = 15 cm.

Answer_____

Show your work below:



b. The radius of a bicycle wheel is 34.5 cm. How far does your bicycle travel for each revolution of the wheel? (*Hint:* The diameter of a circle is equal to twice its radius.)

Answer_____

Show your work below: