ACTIVITIES
using a
CAPE-tech CONSTANT SPEED BUGGY

Materials:
- ◇ a toy car that runs at constant speed
- ◇ stopwatch
- ◇ meter stick
- ◇ photogate timer, sonic ranger, or other device for monitoring or approximating instantaneous speed

1. Measure the time interval (i.e., period) for the flashing headlights on a CAPE-tech buggy. What did you do to make the measurement as accurate as possible?

_____

What was the value of the period you measured? _____

2. Measure the frequency of the flashing headlights on a CAPE-tech buggy. What can be done to make the measurement as accurate as possible?

What was the value of the frequency you measured? _____

3. What is the relationship between the period and the frequency of the headlights on the CAPE-tech buggy? Explain how you determined this relationship!

_____

_____

4. On a level surface (e.g., a table top, the floor, et cetera) measure and mark off a distance of more than one meter. Mark the beginning and the end of the measured distance. Using a stopwatch, determine the time interval and the average speed for the CAPE-tech buggy as it moves this distance.

What can be done to make the measurement as accurate as possible?

_____

What was the value of the average speed you measured? Don't forget the units of measure. _____

5. Using an electronic timing device, determine the instantaneous speed for the CAPE-tech buggy at the middle and end of its trip. If you used a photogate and flag, tell what you did to make the measurement as accurate as possible.

_____

What was the value of the speed you measured at the middle?

_____ at the end? _____

6. How does the average speed over the measured distance compare with the instantaneous speeds measured at the middle and end of the trip?

_____

7. Determine the equivalent of a "*buggy minute*". Explain how this can be done.

_____

Also, explain the meaning of the term "*a light year*".

_____