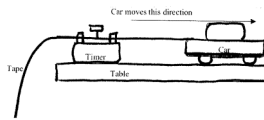


Student Activity: Recording Timer



Name	_____
Date	_____
Period	_____ Table _____

Recording Timer

Purpose:

To become familiar with a recording timer and be able to interpret the data on a marked recording tape

Materials:

C-clamp	paper tape	roll cart
clip	power supply	ruler
meter stick(s)	recording timer	stopwatch (clock)

Procedure:

Part I (Calibrating the period of your timer)

Section A

1. Clamp the recording timer to the table
2. Cut a length of paper tape about one meter long and thread it in the timer
3. Connect the recording timer to the power supply (make sure the tape is being marked)
4. Pull the tape through the timer for exactly 5 seconds (rapidly enough so that the dots are far enough apart to be easily counted) (trial #1)
5. Repeat step 4, using a new one meter long paper tape (trial #2)

Section B

The number of dots on the tape is equal to the number of vibrations of the clapper in 5 seconds. You will calculate the time require for one vibration of the clapper. This could be written time/vibration or time/dot. Notice that both of these expressions indicate that the time (seconds) must be divided by the number of dots. This will give you the length of time, in seconds, required for one vibration. The time required for one vibration of the clapper is called the **period of the timer**.

1. Count the number of dots on each sides of the tape (separately)

Trial 1 = _____ dots

Trial 2 = _____ dots

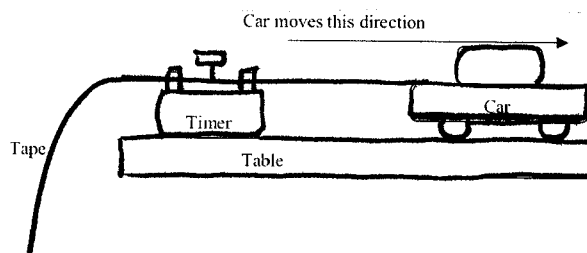
2. Calculate the period of the timer for each trial (5 seconds divided by number of dots counted)

Trial 1 = _____ seconds/dot

Trial 2 = _____ seconds/dot

Average **period** for the timer is: _____ seconds/dot

Do not do anything to change your timer, if you do, you will have to repeat the above.



Part II (Observation of roll cart motion)

1. Draw the loose end of the tape spool through the timer and attach it to the roll cart using a clip or piece of tape.
2. Connect the timer to the power supply and make sure the clapper is marking the paper tape
3. Align the roll cart on the meter stick track.
4. Give the roll cart a good push toward the end of the table. (Make sure there is something at the end of the table to stop the roll cart)
5. Disconnect the tape and the timer.
6. Answer the following questions:

Questions and Answers:

1. What distance did the roll cart travel? _____
(Express your answer to the nearest whole centimeter.)

2. What is the time required for the roll cart to travel the measured distance?

$$\frac{\text{_____}}{\text{(number of dots)}} \times \frac{\text{_____}}{\text{(period of timer)}} = \frac{\text{_____}}{\text{(time skate traveled)}} \text{ seconds}$$

3. What is the average speed ($v=d/t$) of the roll cart? _____ cm/s

4. Looking at your paper tape, answer the following questions:

a. Would you say that the speed of the roll cart is the same for the entire length of the tape? _____

b. How could you tell when the cart is speeding up (increasing speed)?

c. How could you tell when the cart is slowing down (decreasing speed)?

Part III (Variable speeds due to added mass.)

1. Each group will have a different weight to place on the cart.
2. Reconnect a new tape to the roll cart and reconnect the timer.
3. Push the cart just as you did before.
4. Have a student add the weight just after the cart is pushed.

Questions and Answers:

1. How did the added mass effect the distance between the dots? _____

What does this tell you about the speed of the roll cart? _____

2. Comparing roll carts of other groups,

How did an increase in weight effect the speed? _____

How did a decrease in weight effect the speed? _____
