

# PHYSICS 2204

## Core Lab #2: Acceleration

STUDENT NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

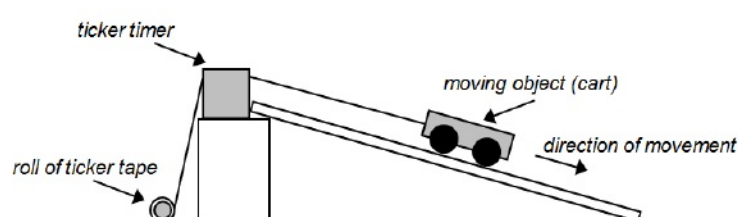
GROUP MEMBERS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**PURPOSE:** To analyze the motion of an accelerating object.



**MATERIALS:**

Ticker Timer (60HZ)  
power supply,  
100 g–200 g mass,  
Wooden Ramp

Ticker tape  
Toy car,  
Metre stick  
Tape

**PROCEDURE:**

1. Connect your **ticker tape timer** to the power supply. Do not turn it on.
2. Make sure the **timer** does not move
3. Cut a piece of **ticker tape** no longer than the height of the lab station. Set the toy car in front of the **timer** on the ramp.
4. Thread the **ticker tape** through the two "guide staples" on the **timer** making sure that it passes underneath the carbon disk. The carbon disk should have its "ink side" down so that a mark will be made on the ticker tape each time the timer's rotating bead strikes it.
5. Attach one end of the tape to the lab cart and leave the other end free to slide through the **timer**.
6. *When you are ready, call your teacher over to inspect your apparatus. If it is correctly set-up, you may then start the power supply.*
7. Let the **timer** run and leave a preliminary "ink blob" of dots to mark the beginning of your experiment before releasing the cart.
8. Let go of the car. As the cart moves along the surface, it will pull the **ticker tape** through the timer leaving a set of "dots" along the backside of the tape. It will travel to the edge of the table where someone should be ready to catch it.

9. Immediately turn off the power supply once the cart reaches the bottom.
10. Before allowing the next group to use the equipment, make sure that you can clearly see the dots on your ticker tape. If there is an error; complete another trial.
11. Measure the distance from the first point on your tape to each of the points on the ticker tape. Do not measure the spacing between consecutive dots! Always measure the distance from the first dot.
12. Create a d-t chart. See below

Note: If the period is an awkward value, then use it as a multiplication factor for the time and place it in the heading of your chart.

Example:

A 60hz timer taps out 60 marks per second: Therefore, 6 taps is a time of 0.10 [s]

13. Produce a d-t graph. See page 3
14. Draw a curve of best fit through the points on the d-t graph.
15. Select five different times along the graph. At these times, draw a tangent and find its slope. Include units in your calculations. Remember to factor in the period of the timer for the run part of the slope calculation See page 3
16. Complete the table for the v-t. See Page 4
17. Produce a v-t. graph. See Page 4
18. Draw a line of Best fit for the v-t graph

**DATA/ CALCULATIONS:**

**Step 12:**

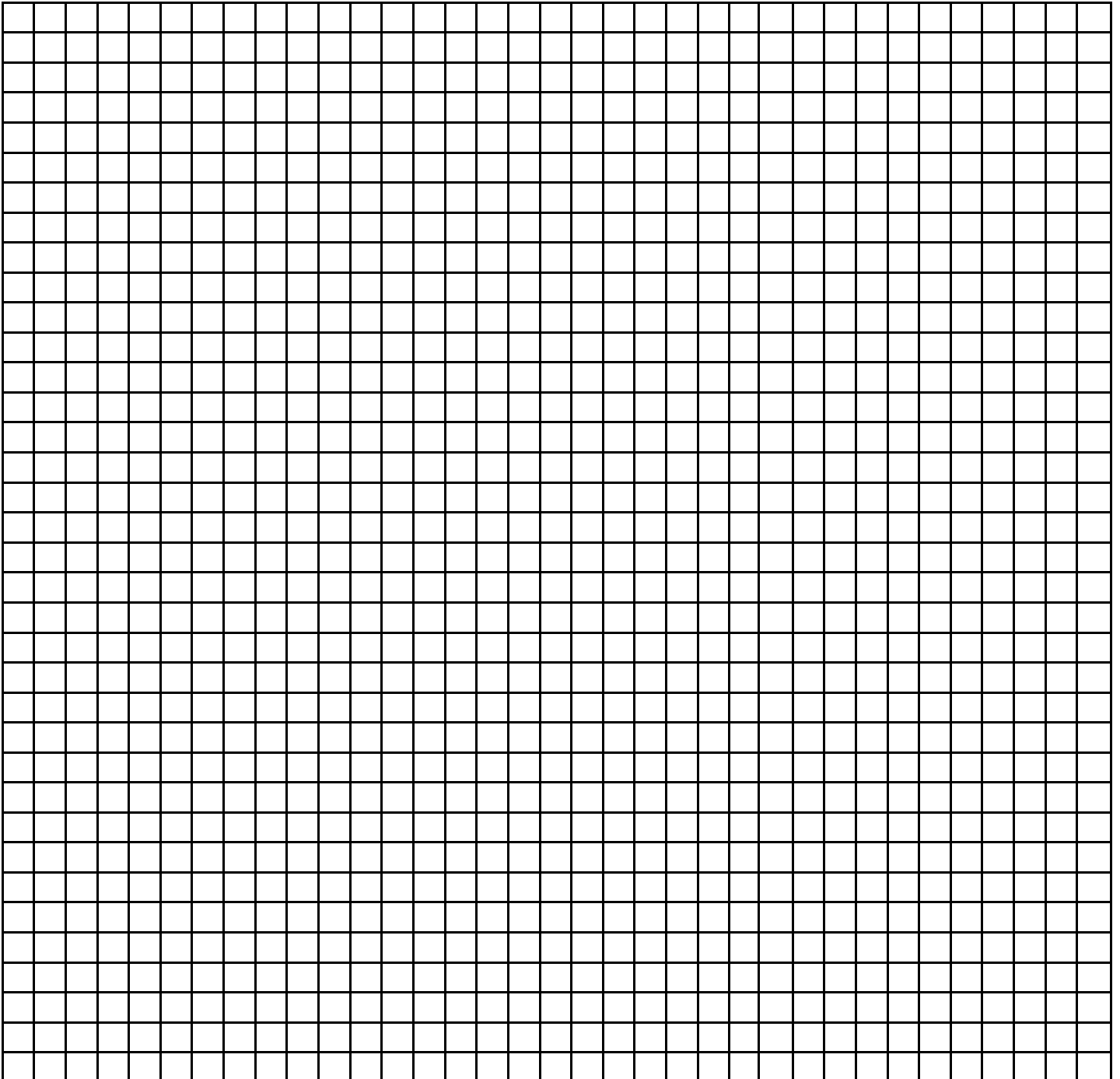
**[1]**

<b>t</b> <b>6 dots = 0.1s</b>	<b>d</b> <b>(cm)</b>

Step 13 and 14

[4]

d-t



Step 15: Calculate four tangents for the graph above: Show all workings

[4]

Step 16

[1]

t	v
0	0

Step 17 and 18

[4]

v-t

