**PHYSICS 2021 - 22 September 6, 2021**

**Today’s Agenda (Day 14)**

1. HOUSEKEEPING ITEMS

🡪 Request for: toy cars

1. HOMEWORK CHECK:

🡪 Chapter 2 Vocabulary

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1. CLASS ACTIVITY

🡪 BEGIN: Chapter 2 PPT Review

1. **Section 1 – Picturing Motion**
2. Section 2 – Where and When
3. Section 3 – Position-Time Graphs

HOMEWORK:

* READ: Chapter 1 – A Physics Toolkit
* READ: Chapter 2 – Representing Motion
* COMPLETE: Chapter 2 Cornell Notes
* COMPLETE: Lab – Ball Bounce
* STUDY: Chapter 1 and Math Review
* STUDY: Ch 1 & 2 Vocabulary

Chapter 1 Vocabulary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Physics | Scientific methods | Hypothesis | Model | Scientific theory |
| Scientific law | Dimensional analysis | Significant figures | Measurement | Precision |
| Accuracy | Independent variable | Dependent variable | Line of best fit | Linear relationship |
| Quadratic relationship | Inverse relationship |  |  |  |

Chapter 2 Vocabulary

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| --- | --- | --- | --- |
| Particle model | Distance | Time interval | Instantaneous position |
| Coordinate system | Magnitude | Displacement | Average velocity |
| Origin | Vector | Resultant | Average speed |
| Position | Scalar | Position-time graph | Instantaneous velocity |

REMINDERS:

* ~~Chapter 2 Vocabulary – Sept. 6~~
* **TEST: Chapter 1 (includes math review) 🡪** **Tuesday, September 7**
* Lab: Ball Bounce – Sept. 7, 11:59:59 pm
* Chapter 2 Notes – Sept. 8
* QUIZ: Ch 1 & 2 Vocabulary **🡪 Thursday, September 9**
* **TEST: Chapter 2 🡪 Tuesday, September 14**

**PHYSICS 2021 - 22 SUMMARY REVIEW**

**CHAPTER 2 SUMMARY REVIEW**

1. The following quantities describe location or its change: position, distance, and displacement. Briefly describe the differences among them.
2. How can you use a clock to find a time interval?
3. How can you use the position-time graphs for two in-line skaters to determine if and when one inline skater will pass the other one?
4. Which equation describes how the average velocity of a moving object relates to its displacement?
5. A walker and a runner leave your front door at the same time. They move in the same direction at different constant velocities. Describe the position-time graphs of each.
6. What does the slope of a position-time graph measure?
7. If you know the time it took an object to travel between two points and the positions of the object at the points, can you determine the object's instantaneous velocity? Its average velocity? Explain.
8. You ride a bike at a constant speed of 4.0 m/s for 5.0 s. How far do you travel?
9. Nora jogs several times a week and always keeps track of how much time she runs each time she goes out. One day she forgets to take her stopwatch with her and wonders if there is a way she can still have some idea of her time. As she passes a particular bank building, she remembers that it is 4.3 km from her house. She knows from her previous training that she has a consistent pace of 4.0 m/s. How long has Nora been jogging when she reaches the bank?
10. You and a friend each drive 50.0 km. You travel at 90.0 km/h; your friend travels at 95.0 km/h. How much sooner will your friend finish the trip?
11. A cyclist traveling along a straight path maintains a constant velocity of 5.0 m/s west. At time t = 0.0 s, the cyclist is 250 m west of point A.
12. Plot a position-time graph of the cyclist’s location from point A at 10.0-s intervals for a total time of 60.0 s.
13. What is the cyclist’s position from point A at 60.0 s?
14. What is the displacement from the starting position at 60.0 s?
15. Both car A and car B leave school when a stopwatch reads zero. Car A travels at a constant 75 km/h, and car B travels at a constant 85 km/h.
16. Draw a position-time graph showing the motion of both cars over 3 hours. How far are the two cars from school when the stopwatch reads 2.0 h? Calculate the distances and show them on your graph.
17. Both cars passed a gas station 120 km from the school. When did each car pass the gas station? Calculate the times and show them on your graph.
18. Convert each of the following time measurements to its equivalent in seconds.

a. 58 ns b. 0.046 Gs c.  9270 ms d. 12.3 ks

1. State the number of significant figures in the following measurements.

a. 3218 kg b. 60.080 kg c. 801 kg d. 0.000534 kg

1. Using a calculator, Chris obtained the following results. Rewrite each answer to each operation using the correct number of significant figures.

a. 5.32 mm + 2.1 mm = 7.4200000 mm

b. 13.597 m × 3.65 m = 49.62905 m2

c. 83.2 kg –12.804 kg = 70.3960000 kg

**PHYSICS 2021 - 22 LAB ACTIVITY**

**Ball Bounce Experiment**

**Purpose**: To find the "bounce constant" for a given ball.

**Procedure**:

1. One person drops a ball from a pre-determined height above the ground while a second person watches to see how high the ball bounces on its first bounce only. Use the bottom of the ball for drop height and rebound height measurements.
2. Record the result.
3. Repeat 2 more times and find the average for the three drops
4. Repeat steps 1-3 for eight heights above the ground.

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| --- | --- | --- | --- | --- |
| Height | Trial A | Trial B | Trial C | Average |
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1. Plot the averages on the attached graph by placing the drop height on the x-axis (horizontal) and the bounce height on the y-axis (vertical). Use as much of the graph as you can for your data. Use centimeters for your units.
2. Using a ruler, draw a single straight line that comes the closest to all of the points at once (line of best fit).
3. Take two points on the line (not data points) to calculate the slope of the line. Use points far apart near the ends of the line.
4. Use these two points to calculate the slope of the line. This is your "bounce constant".

Shape

Description automatically generated with medium confidence

1. Bounce constant = \_\_\_\_\_\_\_\_\_\_\_\_\_

Table

Description automatically generated with medium confidence

1. Give your graph a title and label the x- and y-axes. Be sure to include units with your axes titles.
2. Use the slope and the y-intercept of your line to write an equation for your line in slope-intercept form.
3. Should there be an x- or y-intercept? Explain why or why not.
4. List three reasons why your data may not be 100% accurate.

a.

b.

c.

1. Why do you think I made you do three trials and then average the results?
2. List three ways in which the accuracy and/or precision of this experiment could be improved (within the means of an average high school classroom).

a.

b.

c.

1. Why do you think the rebound height was less than the drop height?
2. If you did this experiment on your table, then did the exact same experiment on the floor, would you expect different results? Why or why not?
3. Try to think back to the Physical Science class you took in middle school and write down all the physics laws, principles, or terms you can remember that are involved in this experiment.