

## CORNELL NOTES

Directions: You must create a minimum of 5 questions in this column per page (average). Use these to study your notes and prepare for tests and quizzes. Notes will be turned in to your teacher at the end of the Unit for scoring.

# UNIT 2: Physics

## Chapter 3: Describing Motion (pages 68-95)

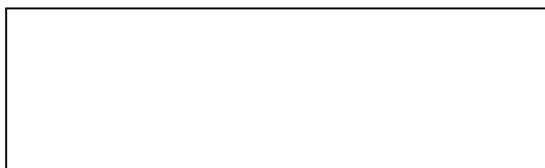
### I. Describing Motion

#### A. Motion

1. **Motion** occurs when an object changes \_\_\_\_\_
2. To measure the position of an object, a \_\_\_\_\_ **frame** must be chosen
  - a. **Reference frame**- a group of objects that are \_\_\_\_\_ relative to each other
  - b. One point in reference frame is chosen as the **reference** \_\_\_\_\_
3. **Motion is relative**- motion of object \_\_\_\_\_ on the **reference frame** that is chosen
4. **Distance and Displacement**
  - a. **Displacement**- \_\_\_\_\_ and \_\_\_\_\_ of an object's final position from its initial position
    - 1). Includes both a \_\_\_\_\_ and \_\_\_\_\_
    - 2). \_\_\_\_\_ describe something with both size and direction
  - b. Distance alone is not a \_\_\_\_\_
5. **Speed**- \_\_\_\_\_ an object travels per unit of \_\_\_\_\_

#### B. Speed

- a. **SI unit of speed** is \_\_\_\_\_ per second (**m/s**)
- b. \_\_\_\_\_ **speed**- speed at any given instant. Car speedometer measures instantaneous speed
- c. \_\_\_\_\_ **speed**- total distance traveled divided by the total time traveled



C. \_\_\_\_\_ - speed of the object and its direction

1. is a \_\_\_\_\_ quantity

2. **Size** of objects velocity is \_\_\_\_\_

3. Object will have different velocities if have different \_\_\_\_\_ or move in different \_\_\_\_\_

4. The **velocity** of an object can change even if the \_\_\_\_\_ of the object remains constant (e.g. driving in a circle)

D. Graphing Motion

1. **Motion** of object over a period of time can be shown on a \_\_\_\_\_ - \_\_\_\_\_ **graph**

a. \_\_\_\_\_ is plotted on horizontal axis (**x-axis**)

b. \_\_\_\_\_ plotted along vertical axis (**y-axis**)

2. The \_\_\_\_\_ (steepness) of a line graph equals the **speed**

a. When **slope is** \_\_\_\_\_ (line is **horizontal**) the **speed is** \_\_\_\_\_

b. **Steeper the slope**, the \_\_\_\_\_ the **speed**

II. Acceleration

A. Acceleration, Speed, and Velocity

1. \_\_\_\_\_ - change in velocity divided by the time for the change to occur

2. **Velocity is a vector**, so change in velocity can be either change in \_\_\_\_\_ or \_\_\_\_\_ of the motion

3. **Acceleration** is a \_\_\_\_\_ (has **size** and **direction**)

4. Any time an object changes direction, its velocity changes and it is \_\_\_\_\_

B. Calculating Acceleration

1. Can calculate an objects **average acceleration**

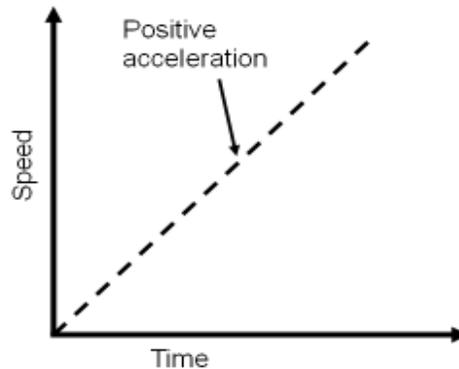


2. **Speed-Time Graphs**- for object moving in one direction, the acceleration can be found from a \_\_\_\_\_-\_\_\_\_\_ graph

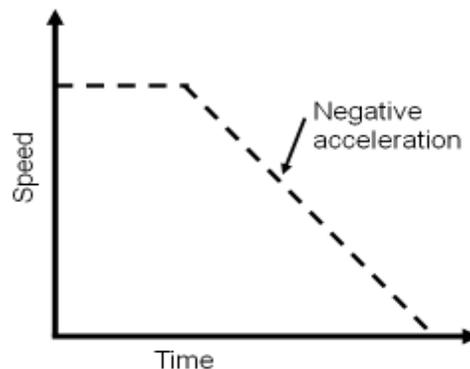
a. **vertical axis** is the objects \_\_\_\_\_

b. **horizontal axis** is the \_\_\_\_\_

3. **Positive acceleration**- positive slope (**speed is** \_\_\_\_\_)



4. **Negative acceleration**- negative slope (**speed is** \_\_\_\_\_)



C. Amusement Park Acceleration- roller coasters can give riders large \_\_\_\_\_

## II. Motion and Forces

A. What is force?

1. **force**- is a \_\_\_\_\_ or \_\_\_\_\_ that one object exerts on another

2. Force is a \_\_\_\_\_ (**size** and **direction**)

3. **SI unit of force** is \_\_\_\_\_ (**N**)

4. A **force** can cause the \_\_\_\_\_ of an object to **change**

5. \_\_\_\_\_ forces change velocity

a. If **net force** is \_\_\_\_\_ no change in velocity

b. If **net force** is **not zero** ( \_\_\_\_\_ ) velocity will change

**B. Friction-** force that opposes the \_\_\_\_\_ motion of two surfaces that are in \_\_\_\_\_

1. The **size of frictional force** depends on the \_\_\_\_\_ the surfaces are made from and the \_\_\_\_\_ of the surfaces

2. **Frictional force** between two surfaces **increases** when the \_\_\_\_\_ pushing the surfaces together **increases**

3. \_\_\_\_\_ **friction-** friction that prevents two surfaces in contact from sliding past each other

4. \_\_\_\_\_ **friction-** the force that acts in the opposite direction to the motion of a surface sliding on another surface.

**C. Air Resistance-** \_\_\_\_\_ force opposes motion of objects that move through \_\_\_\_\_

1. Air resistance acts in direction \_\_\_\_\_ to velocity of an object moving in air

2. **Size of air resistance** depends on the \_\_\_\_\_ and \_\_\_\_\_ of an object

3. \_\_\_\_\_ **velocity-** the maximum velocity a falling object will reach

a. Depends on objects \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ of falling object

b. Object reaches **terminal velocity** when \_\_\_\_\_ equals \_\_\_\_\_.