

Unit 7: Motion

Unit 7 Review Sheet

Name _____

1. What is the difference between speed and velocity?

They both include distance per unit of time, but only velocity includes direction

2. Find the speed of the baseball that traveled 75 meters in 3 seconds.

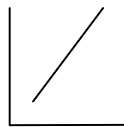
Speed = distance/time = 75m/3sec = 25 m/s

3. Find the acceleration of the swimmer if she obtained a velocity of 2 m/s in 10 seconds

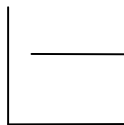
Acceleration = (final velocity -initial velocity) / time = (2 m/s - 0 m/s) ÷ 10s = .2 m/s²

4. draw a distance vs. time graph for:

a. constant speed

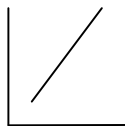


b. standing still



5. draw a velocity vs. time graph for:

a. acceleration



b. deceleration



6. What is the difference between a balanced and an unbalanced force?

A balanced force: Forces that are equal, resulting in not change in velocity (no acceleration)

An unbalanced force: forces are unequal, resulting in a change in velocity (acceleration)

7. What is a centripetal force?

A net force that is directed toward the center of a curved or circular path

8. What does Newton's First Law of Motion say (inertia)?

An object in motion tends to stay in motion unless acted upon by an unbalanced force. An object at rest tends to stay at rest unless acted upon by an unbalanced force.

9. The amount of gravitational force between two objects depends on:

The mass of the two objects and the distance between them.

10. When two object of the same weight but different shapes are dropped from the same height, which one will hit the ground first? Why?

The one that has the least air resistance, but in a vacuum they would fall at the same rate and hit at the same time.

11. What is friction?

Friction is the force that opposes the sliding motion of two surfaces that are touching each other.

12. What does Newton's Second Law of Motion say?

The acceleration of an object is in the same direction as the net force on the object
Force = mass x acceleration

13. Which two things affect the amount of momentum an object will have?

Momentum = mass x velocity
 $p = m \times v$

14. What is the momentum of a car that has a mass of 2500 kg and is traveling at a speed of 30 m/s?

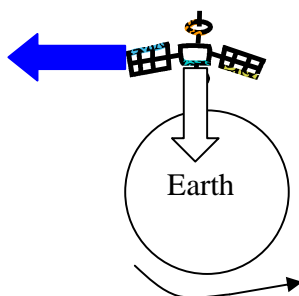
$P = m \times v$
 $P = 2500 \text{ kg} \times 30 \text{ m/s} = 75000 \text{ kg m/s}$

15. What does Newton's Third Law of Motion say?

When one object exerts a force on a second object, the second one exerts a force on the first that is equal in strength and in the opposite direction.

16. Below is a picture of a satellite orbiting the Earth.

- Draw an arrow showing the direction that inertia is acting on the satellite. (blue arrow)
- Draw an arrow showing the direction that gravity is acting on the satellite. (white arrow)



17. How much work was Dougie doing if he pushed against the wall for 1 hour with a force of 400 N and the wall did not move?

Work = force x distance = 400 N x 0 m = 0 J

18. How much work did Madison do if she pushed her books with a force of 150 N for 3 meters across the floor?

$$\text{Work} = \text{force} \times \text{distance} = 150 \text{ N} \times 3 \text{ m} = 450 \text{ J}$$

19. List the six simple machines.

- | | |
|-------------------|-------------------|
| a. Lever | d. Inclined plane |
| b. Pulley | e. Wedge |
| c. Wheel and axel | f. Screw |

20. What is the mechanical advantage of a ramp that is used to move a piano onto a truck of the ramp is 8 meters long and 1 meter high?

$$\text{Mechanical advantage} = (\text{distance}_{\text{effort}} \div \text{distance}_{\text{work}}) \times 100\% = 8\text{m} \div 1\text{m} = 800\%$$

21. What is the definition of power?

$$\text{Power} = \text{work (J)} \div \text{time (sec.)} = \text{Watts}$$

22. What is the difference between mass and weight?

Mass is the amount of “stuff” (matter) an object is made up of and weight is the measure of the gravitational force acting on that mass.