

Chapter Review

Forces

Part A. Vocabulary Review

Directions: In the space at the left, write the term from the list that correctly completes each statement.

- gravity weight distance newtons momentum
 terminal velocity Newton's second law of motion projectile
 centripetal force Newton's third law of motion centripetal acceleration
 air resistance conservation of momentum sliding friction static friction

Newton's 3rd Law

1. The phrase "to every action there is an equal and opposite reaction" is _____.

Terminal Velocity

2. The largest velocity reached by a falling object is its _____.

Projectile

3. A ball thrown across a football field is an example of a(n) _____.

Centripetal Force

4. When an object moves in a circle, _____ acts to accelerate the object toward the center of that circle.

Centripetal Acceleration

5. When a car travels around a curve in the road, _____ helps to keep the car traveling in a curved path.

Air Resistance

6. The force exerted by air on a moving object is called _____.

Newton's 2nd Law

7. A net force acting on an object causes the object to accelerate in the direction of the force; this is _____.

Momentum

8. A property of a moving object resulting from its mass and velocity is _____.

Conservation of momentum

9. According to the _____, when a bowling ball strikes the pins, the momentum lost by the bowling ball is equal to the momentum gained by the pins.

Gravity

10. _____ is the force that every object in the universe exerts on every other object.

Weight

11. An object's _____ is the measure of the force of gravity on that object.

Distance

12. The amount of gravitational force between two objects depends on their masses and the _____ between them.

Newtons

13. Weight is measured in units called _____, while mass is measured in units called grams and kilograms.

Static Friction

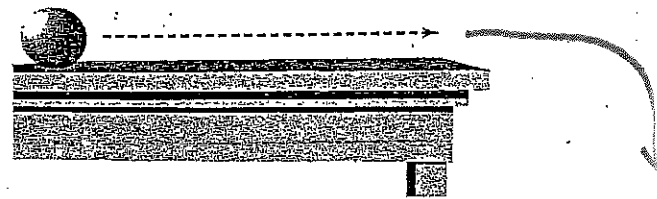
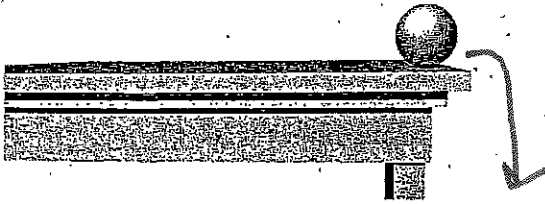
14. Two surfaces that are not moving past each other have _____.

Sliding Friction

15. _____ causes a box you are pushing across the floor to stop when you stop pushing.

Chapter Review (continued)**Part B. Concept Review**

2. Complete the diagrams below by indicating the path of the ball in each situation.



- a. The ball is placed on the edge of a table and allowed to fall to the floor.
 b. The ball is rolled rapidly across the table and falls onto the floor.
3. The balls in the figure above have the same mass. If the balls are dropped from the table at the same time, which ball will hit the floor first?

They will hit at the same time, Both have the same Acceleration downwards, Gravity!

4. If a 2-kg ball is thrown through the air at 20 m/s, what is the momentum of the ball?

$$m = 2 \text{ kg}$$

$$v = 20 \text{ m/s}$$

$$P = m \cdot v$$

$$= (2 \text{ kg})(20 \text{ m/s})$$

$$P = 40 \text{ kg m/s}$$

5. Why would a flat sheet of paper and a wad of paper with the same mass not fall through the air at the same rate?

the flat sheet has more Air resistance that slows it down

6. When is something weightless?

When its in space & not affected by the Gravity pull of Earth

7. What are the three types of friction and how are they different?

① Static - Not moving objects

② Sliding - 1 surface sliding over another

③ Rolling - 1 surface Rolls over another

④ Fluid - when an object moves through Air or water

SECTION 3

Reinforcement

The Third Law of Motion

Directions: Use the illustrations to answer the following questions.

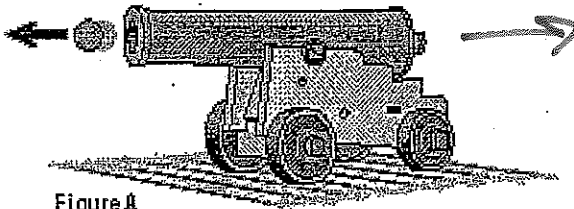


Figure A

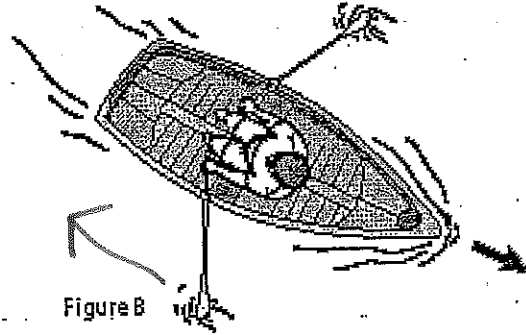


Figure B

1. Draw an arrow on Figure A to show the direction the cannon will move when the cannonball is fired.
2. Draw arrows on Figure B to show the direction the oars must move to propel the boat forward.
3. Does the arrow you drew on Figure A represent an action force or a reaction force?

Yes it does Represent An Reaction force

4. Do the arrows you drew on Figure B represent an action force or a reaction force?

Yes it Does - Action force

5. If the force that propels the cannonball forward is 500 N, how much force will move the cannon backward? Explain.

it will exert 500N on the Cannon, But the cannon wont move as much as the Cannon Ball

Directions: Solve the following problems.

6. What is the momentum of a 2-kg toy truck that moves at 10 m/s?

$$p = ?$$

$$m = 2 \text{ kg}$$

$$v = 10 \text{ m/s}$$

$$p = mv$$

$$p = (2 \text{ kg})(10 \text{ m/s})$$

$$p = 20 \text{ kg} \cdot \text{m/s}$$

7. What is the momentum of a 2000-kg truck that moves at 10 m/s?

$$p = ?$$

$$m = 2000 \text{ kg}$$

$$v = 10 \text{ m/s}$$

$$p = mv$$

$$p = (2000 \text{ kg})(10 \text{ m/s})$$

$$p = 20000 \text{ kg} \cdot \text{m/s}$$

8. Which truck has more momentum? Why?

The 2000 kg truck has more momentum Because it has A higher mass



Momentum Problems

Physical Science

Name _____

Period _____

Date _____

$P = m \times v$

- 1) What is the momentum of a 1250 kg truck traveling a constant velocity of 5 m/s?

$$\begin{aligned}
 P &= ? & P &= m v \\
 m &= 1250 \text{ kg} & P &= (1250 \text{ kg})(5 \text{ m/s}) \\
 v &= 5 \text{ m/s} & P &= 6250 \text{ kg} \cdot \text{m/s}
 \end{aligned}$$

- 2) What is the mass of a football player running with a speed of .75 m/s and a total momentum of 75 kg·m/s?

$$\begin{aligned}
 m &= ? \\
 v &= .75 \text{ m/s} \\
 P &= 75 \text{ kg} \cdot \text{m/s}
 \end{aligned}$$

$$\begin{aligned}
 m &= \frac{P}{v} \\
 m &= \frac{75 \text{ kg} \cdot \text{m/s}}{.75 \text{ m/s}}
 \end{aligned}$$

$$\boxed{m = 100 \text{ kg}}$$

- 3) What has more momentum: Car A traveling with a velocity of 7 m/s and having a mass of 1500 kg, or Truck B traveling with a velocity of 4 m/s and having a mass of 2,600 kg?

$$\begin{aligned}
 \text{Car} \\
 v &= 7 \text{ m/s} \\
 m &= 1500 \text{ kg} \\
 P &= ?
 \end{aligned}$$

$$\begin{aligned}
 P &= m v \\
 &= (1500 \text{ kg})(7 \text{ m/s}) \\
 P &= 10500 \text{ kg} \cdot \text{m/s} \\
 \text{CAR}
 \end{aligned}$$

$$\begin{aligned}
 \text{Truck} \\
 P &= ? \\
 v &= 4 \text{ m/s} \\
 m &= 2600 \text{ kg}
 \end{aligned}$$

$$\begin{aligned}
 P &= m v \\
 &= (2600 \text{ kg})(4 \text{ m/s}) \\
 P &= 10400 \text{ kg} \cdot \text{m/s} \\
 \text{Truck}
 \end{aligned}$$

CAR HAS MORE

- 4) What is the speed of an airplane having a mass of 4500 kg and a momentum of 135,000 kg·m/s?

$$\begin{aligned}
 v &= ? \\
 m &= 4500 \text{ kg} \\
 P &= 135,000 \text{ kg} \cdot \text{m/s}
 \end{aligned}$$

$$\begin{aligned}
 v &= \frac{P}{m} \\
 &= \frac{135,000 \text{ kg} \cdot \text{m/s}}{4500 \text{ kg}}
 \end{aligned}$$

$$\boxed{v = 30 \text{ m/s}}$$