COMMENTS: Inertia makes an object that is not moving stay motionless until some outside force puts it into motion. It makes a moving object keep moving until some outside force stops it. (Most often this outside force is friction.) The amount of inertia required to either move or stop an object depends on the object's mass. The greater the mass, the greater the inertia.

A Underline the correct answers.

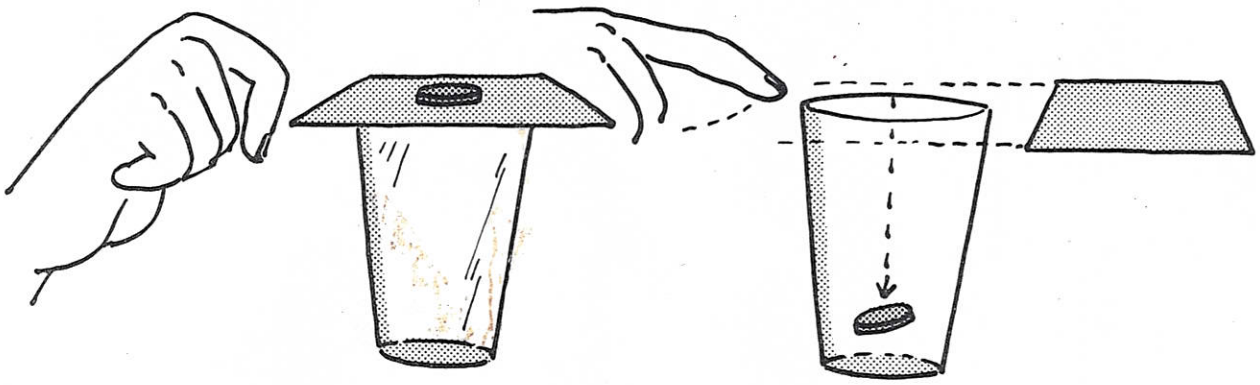
1. Inertia was first described by (a. Edison b. Newton c. Galileo).
2. Motion is caused by (a. force b. inertia).
3. Inertia is a form of (a. opposition b. resistance) to motion.
4. Movement is opposed by (a. friction b. inertia).
5. Inertia helps scientists measure (a. mass b. objects) in space.
6. Gravity is a (a. force b. energy c. motion).
7. All (a. matter b. objects c. masses) tend not to change their motions.
8. Inertia could cause you to (a. move b. fall).

B True or False

T 1. Inertia is one of Newton's laws of motion.
_____ 2. Gravity has no effect on inertia.
_____ 3. Inertia and friction have something in common.
_____ 4. Inertia and friction both oppose motion.
_____ 5. Non-moving objects tend to change position with motion.
_____ 6. The mass of an object stays the same in space.
_____ 7. A sudden start by a bus can cause you to fall backwards.
_____ 8. The law of inertia works on all objects.
_____ 9. Objects fall at the same rate of speed because of inertia.
_____ 10. Engineers are never interested in inertia.

Inertia

The inertia of the coin enables us to flick the card from beneath it as the coin drops into the glass.



Name Date Class

SECTION 1 Reinforcement

Newton's First Law

15	2	11	3	6	11	15	7	10	13	11	14	4	5	15	6	2	7	11	10	15	13	13	3	7	11	2	8	5
14	1	12	5	7	12	1	9	2	1	3	12	9	15	2	11	8	13	2	5	8	3	14	12	14	6	3	8	5
13	3	4	8	10	9	4	11	3	4	2	12	8	6	12	12	9	7	9	15	2	11	10	11	6	3	15	9	4
10	8	2	3	13	2	5	8	12	10	8	9	9	10	11	3	8	6	12	4	9	9	13	12	4	8	11	4	1
15	9	11	9	14	8	6	4	13	5	3	11	2	14	3	8	12	7	3	10	1	14	7	2	1	12	9	2	10

Directions: *Mark each statement below either* **true** *or* **false**. *For each true statement, fill in all the corresponding numbers in the box above. When you're done, you'll find an important word from this chapter.*

_____ 1. When the net force is zero, the forces on an object are balanced.

_____ 2. If two forces are in the same direction, they cancel each other out.

_____ 3. Any time the forces are unbalanced, an object will remain at rest.

_____ 4. According to Newton's first law of motion, an object at rest will stay at rest until a net force acts upon it.

_____ 5. According to Newton's first law of motion, an object moving at a constant speed in a straight path will continue to do so until a net force acts upon it.

_____ 6. Friction brings most moving objects to a stop.

_____ 7. Friction will never speed up an object.

_____ 8. Galileo believed that the natural state of an object was to be at rest.

_____ 9. If you slide a bag of groceries along a countertop, you must first overcome rolling friction.

_____ 10. Walking would be impossible without rolling friction.

_____ 11. Rolling friction always reduces the net force acting against an object's motion to zero.

_____ 12. Sliding friction is caused by the attraction between the two surfaces.

_____ 13. If an object accelerates, a push or pull must be acting on it.

_____ 14. If an object is not moving, the net force working on it is zero.

_____ 15. Friction can be reduced but never eliminated.

16. The word in the puzzle is _____.

Meeting Individual Needs

Copyright © Glencoe/McGraw-Hill, a division of the McGraw-Hill Companies, Inc.

Practice: Force and Newton's 1st Law

Answer the following questions. You may use a separate sheet of paper, if needed.

1. Draw and label a picture to show the difference between balanced and unbalanced forces.

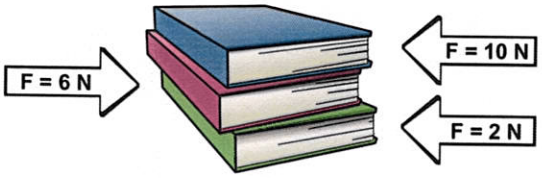
2. Explain how balanced and unbalanced forces affect an object's motion differently.

3. Can there be forces acting on an object at rest? Explain why or why not.

4. What is the net force on an object that has balanced forces acting on it?

5. Find the net force acting on the books below.

6. Find the net force acting on the books below.



7. Two students push on a box in the same direction and a third student pushes in the opposite direction. What is the net force on the box if each push with a force of 50 N?

8. Why is Newton's 1st Law also known as the Law of Inertia?

9. The more _____ an object has, the more inertia it has.

10. Rank the following objects from least amount of inertia to most amount of inertia.

Textbook Pencil Kindergartener Elephant

© It's Not Rocket Science 2017

Practice: Motion Laws Application

Part 1 Name that Law: *Read each scenario below and name which law is at work. Choose from: Newton's 1st Law, Newton's 2nd Law, Newton's 3rd Law, the Law of Universal Gravitation, and the Law of Conservation of Momentum.*

1. Your dirty clothes, left on the floor overnight, are there when you wake up in the morning
2. Jumping on a trampoline causes you to fly up in the air.
3. A kicked soccer ball will eventually stop rolling, due to the grass.
4. A motorcycle can reach a speed of 60 mi/hr much faster than a minivan can.
5. When a fireman turns on the water coming through the hose he feels the hose push him backwards. Sometimes it takes more than one fireman to hold the hose.
6. A driver isn't paying attention while he texts and drives, colliding with the parked car in front of him and transferring all of his car's moving force into it.
7. You run into your friend while ice skating and both of you fall in opposite directions.
8. The bike you are riding hits a crack in the sidewalk and stops quickly, sending you flying over the handlebars.
9. If you don't keep giving a car gas, the car will eventually stop.
10. A baseball player hits a ball towards the outfield.
11. A satellite in orbit maintains a constant speed while orbiting around the earth.
12. An acorn falls from a tree and lands on the ground.
13. In a head on collision, if you aren't wearing your seatbelt you could go through the window.
14. It takes an airplane nearly ¾ of a mile to stop.
15. Swimming in a pool requires that you push back on the water in order to go forward.

Part 2 Predict the Motion: *Read and predict the motion of the object, based on which law is at work.*

16. According to **Newton's 1st Law of Motion**, if you leave a cookie on a plate and there is no one else in the house, where will the cookie be in an hour?

17. According to **Newton's 2nd Law of Motion**, if you hit a ping-pong pall and a tennis ball with a tennis racket, which one should have a greater acceleration?

18. According to **Newton's 3rd Law of Motion**, if you apply the force of your body down onto a trampoline, what should the trampoline do back to you?

19. According to the **Law of Universal Gravitation**, if you drop a tennis ball and an apple at the same time, what should you observe?

20. According to the **Law of Conservation of Momentum**, if you are playing pool and hit the cue ball at the stationary 8 ball, what should happen?

© It's Not Rocket Science 2017