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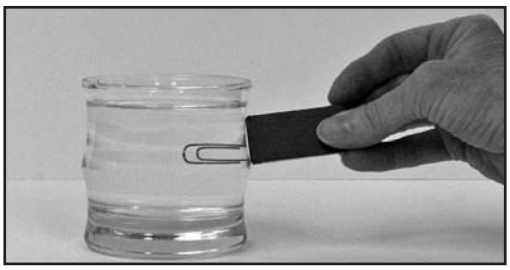
Magnetic forces can act through solids, gases, and liquids. In the image below, the paper clip is inside a glass of water. When the magnet moves near the glass, the paper clip moves toward the magnet. The force of a magnet on an object gets smaller as the magnet moves away from the object. If the magnet in the image moves away from the paper clip, the magnetic force will get smaller, and the paper clip will fall to the bottom of the glass.



A student pulls a magnet away from the refrigerator and then lets it go. She notices that the magnet moves back to the refrigerator when it is 1 cm away, but it falls to the ground when it is 3 cm away. Explain why this happens.

The magnetic force between the magnet and the refrigerator gets smaller as the magnet moves away from the refrigerator. Eventually, the magnetic force is so weak that it does not attract the magnet. When this happens, the magnet falls to the ground.

All objects attract each other with a force called **gravity.** Gravity acts between objects that are not touching. Like the magnetic force, gravity acts through solids, gases, and liquids. This means that gravity will affect you when you are inside a building, flying through the air, or swimming underwater.

The force of gravity between most objects is very small. For example, the force of gravity between you and your desk is so small that you cannot feel it. However, the force of gravity between Earth and objects is very strong. Earth's gravity pulls all objects near Earth toward Earth's center. That is why a ball falls to the ground when you drop it.

Gravity is the force of attraction between two objects. Gravity is *always* a pull, never a push.

There is gravity between you and other people. However, you don't feel yourself being pulled toward the person sitting next to you. You are close together, but your masses are small. Compared with other forces, the force of gravity between you and the other person is weak, so you cannot feel it.

It's Your Turn

Please read each question carefully. For each multiple-choice question, circle the letter of the correct response.

1 A student kicks a soccer ball. It flies into the air and then comes back down to the ground. The ball falls to the ground because

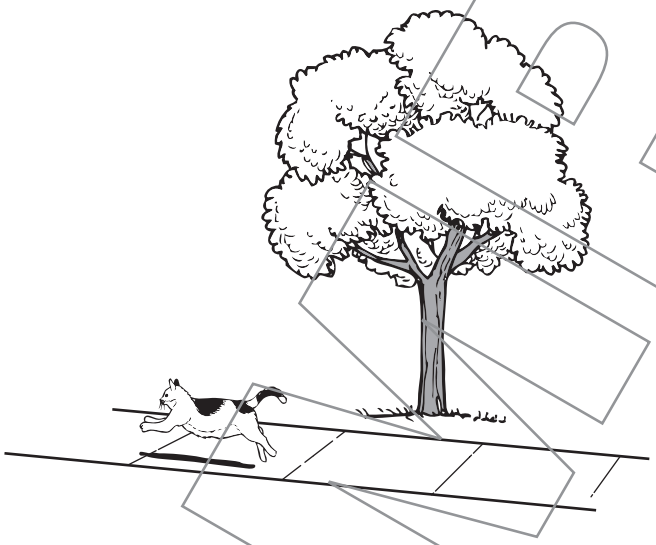
A the force of gravity pulled it back to Earth

B it wanted to return to Earth's surface

C it is heavy

D the force of the wind pushed it down

2 The picture shows a cat, a sidewalk, a tree, and some grass.



Which of the following best describes the position of the cat?

A on top of the grass

B to the west

C to the left of the tree

D outside of the sidewalk

3 A student holds a magnet over some pieces of iron. They move toward the magnet. When the student pulls the magnet away from the iron, the iron will probably

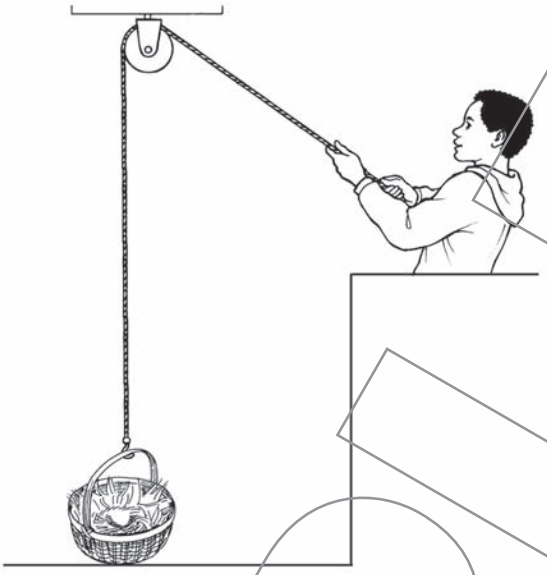
A fall off the table

B be lifted off the table

C move closer to the magnet

D stop moving toward the magnet

4 **A boy makes a pulley. He attaches a large basket to one end of the rope, and he pulls on the other end.**



When the boy pulls on the rope, the basket will probably

A become lighter

B move upward

C move downward

D become magnetic

5 **A student has two objects. Object A is a steel nail in a plastic container. Object B is a steel nail on the floor. What will most likely happen when she brings a magnet near the two objects?**

A Both objects will remain still.

B Both objects will move toward the magnet.

C Object A will move toward the magnet, but object B will remain still.

D Object B will move toward the magnet, but object A will remain still.

For this open-ended question, write your answer on the line.

6 **A girl is sledding down a snowy hill. At the bottom of the hill, the sled slows down and then stops. What force made the sled slow down and stop?**

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