

Exhibit Exploration Guide

Grade
8

Learning World Key

Energy Factory = EF

Water Works = WW

Idea Lab = IL

Mind Zone = MZ



Ohio's Learning Standards for Science

8.ESS.3: A combination of constructive and destructive geologic processes formed Earth's surface. Earth's surface is formed from a variety of different geologic processes. **WW**

8.PS.1: Objects can experience a force due to an external field such as magnetic, electrostatic, or gravitational fields. Magnetic, electrical and gravitational forces can act at a distance. **EF, MZ**

8.PS.2: Forces can act to change the motion of objects. The motion of an object is always measured with respect to a reference point. Forces can be added. The net force on an object is the sum of all of the forces acting on the object. If there is a nonzero net force acting on an object, its speed and/or direction will change. Kinetic friction and drag are forces that act in a direction opposite the relative motion of objects. **IL**



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Energy Factory

Floating in Copper

1. Answers will vary

Magnet Cloud

1. Answers will vary
2. No; the magnetic field gets weaker the farther away from the magnet you get.

Ring Launcher

1. The aluminum ring moves away from the copper coil and jumps in the air when an electrical current flows through the wires.
2. The aluminum ring only gets repelled when you hit the button because the magnetic field only exists when the electrical current is flowing.

1. Answers will vary
2. Answers will vary

Idea Lab

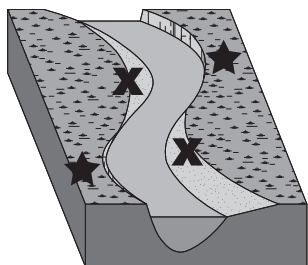
Air Cars

1. friction, a pushing force from the wall
2. ←

Water Works

Erosion and Deposition

1. Answers will vary
- 2.



Mind Zone

Distorted Gravity Room



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Energy Factory

Some forces, such as a magnetic force, can act over a distance.

Magnets are surrounded by an area of influence, called a field.

Magnets can exert forces on other magnetic objects that are within their field.

Floating in Copper (8.PS.1)

1. Use the magnet outside the copper tube to move the magnet inside the copper tube.

Try to get the inner magnet to levitate in the air. For how many seconds are you able to get the inner magnet to levitate?

Magnet Cloud (8.PS.1)

This exhibit can help you visualize magnetic fields.

1. Use the magnet to carry some of the iron particles to the top of the tube. Pull the magnet away and move the magnet halfway down the tube to “catch” the iron particles as they drift down. What does it look like as the iron particles get attracted to the magnet? Answer using a written description or drawing.

2. Do magnetic fields have the same strength at any distance from the magnet?

Ring Launcher (8.PS.1)

Look at the copper coils at the base of the Ring Launcher. Push the red button to send an electrical current through the copper coils.

1. What happens to the aluminum ring when the electrical current flows through the wires?

2. The aluminum ring was repelled by a magnetic field created in the copper coils.

Why do you think the aluminum ring only gets repelled when you hit the button?



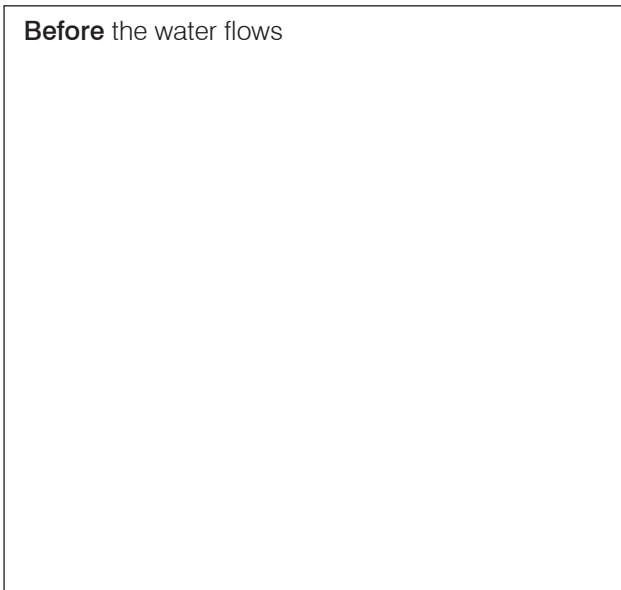
Water Works

Erosion and Deposition (8.ESS.3)

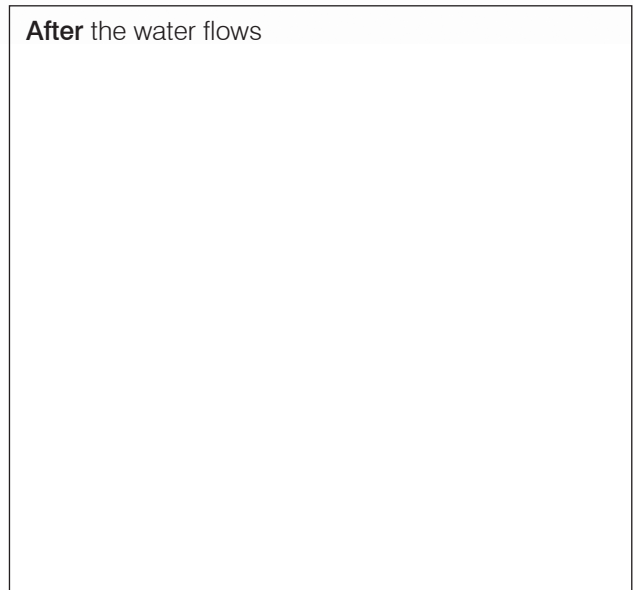
A combination of constructive and destructive geologic processes formed Earth's surface. Earth's surface is formed from a variety of different geologic processes.

1. With the water source turned off, dig a **winding** channel through the sand from the water source to the catch basin. Then turn the water on. Draw what it looks like before and after you turn the water on.

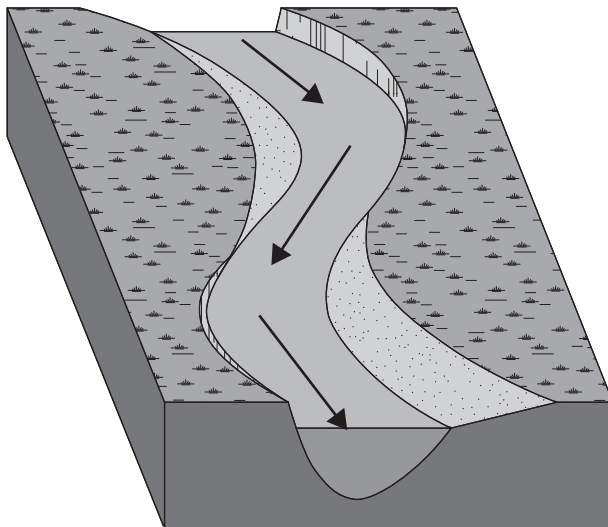
Before the water flows



After the water flows



2. Fast moving water can pick up and move soil and sediment in a process called erosion. Slow moving water will lay the sediment down in a process called deposition. Look at the diagram below and **star** where you think the **fast** water erodes sediment **away** from the river bank. Mark with an **X** where you think **slow** water deposits sediment back **down** on the river bank.



Mind Zone

Distorted Gravity Room (8.PS.1)

In the Distorted Gravity Room, the pull of gravity may seem different, due to an illusion. However, Earth's gravitational pull is the same magnitude both inside and outside the Distorted Gravity Room, and is still pulling objects straight down toward Earth. Try some of the following activities.

1. Make a prediction about which direction is straight down in the Distorted Gravity Room. Then use something that can dangle freely (such as a necklace, lanyard, or paperclip chain) to test your prediction. The freely dangling object should point straight down.

What were the results of your tests?

Did anything surprise or intrigue you?

2. Make a prediction about what will happen when you drop a ball in the Distorted Gravity Room.

Which direction will the ball fall? _____

Which direction will the ball bounce? _____

What were the results of your tests?

Did anything surprise or intrigue you?



Idea Lab

Air Cars (8.PS.2)

Construct an air car and launch it down the ramp.

1. What force or forces caused the car to stop?

2. The car is moving forward along the track, as shown by the arrow.



Circle the arrow that represents the direction of the force of friction applied to the car.

