

# Exhibit Exploration Guide

Grade  
**2**

## Learning World Key

Energy Factory = EF

Water Works = WW

Grow U = GU

Mind Zone = MZ



## Ohio's Learning Standards for Science

2.ESS.1: The atmosphere is primarily made up of air. Air has properties that can be observed and measured. The transfer of energy in the atmosphere causes air movement, which is felt as wind. Wind speed and direction can be measured. **WW**

2.ESS.2: Water is present in the atmosphere. Water is present in the atmosphere as water vapor. When water vapor in the atmosphere cools, it forms clouds, fog, rain, ice, snow, sleet or hail. **WW**

2.ESS.3: Long- and short-term weather changes occur due to changes in energy. Changes in energy affect all aspects of weather, including temperature, precipitation, and wind. **WW**

2.PS.1: Forces change the motion of an object. Motion can increase, change direction or stop depending on the force applied. The change in motion of an object is related to the size of the force. Some forces act without touching, such as using a magnet to move an object or objects falling to the ground. **EF, MZ**

2.LS.1: Living things cause changes on Earth. Living things function and interact with their physical environments. Living things cause changes in the environments where they live; the changes can be very noticeable or slightly noticeable, fast or slow. **GU**



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## Water Works

### Cloud Pusher

1. Clouds, water
2. The air and clouds come out

### Cloud Pusher and Fog Machine

1. Wet
2. Answers will vary. Sample answers: wet, cloudy, swirly, white
3. Answers will vary.
4. Water droplets
5. Water

### Hurricane Chamber

1. Answers will vary

	Wind Type	Max Wind Speed (miles per hour)	I noticed...
<b>Trial 1</b>	Strong Gale Winds	46 mph	Answers will vary
<b>Trial 2</b>	Violent Storm Winds	63 mph	Answers will vary
<b>Trial 3</b>	Category 1 Hurricane	95 mph	Answers will vary

2. Answers will vary.  
Sample answer: A hurricane probably won't occur near the North Pole because hurricanes need warm water to form and it is too cold at the North Pole.

### Pier 19 Weather Station

1. Answers will vary based on student choice.
2. Answers will vary based on question 1:  
Spring: 15 hours 11 minutes  
Summer: 15 hours 11 minutes  
Fall/Autumn: 12 hours 11 minutes  
Winter: maximum: 12 hours 7 minutes
3. Answers will vary based on answer to question 1.

## Energy Factory

### Spinning Blackboard

1. Some of the sand flies off the wheel

### Ring Launcher

1. The ring jumps up in the air/moves up the pole.
2. Sample answer: No, things don't have to touch Earth for gravity to work. I know this because when I jump or toss a ball in the air, it comes back down without touching anything.

### Giant Radar Magnet

1. Sample answer: It's hard to pull or it feels like it's pulling back.
2. No written answer necessary.

## Mind Zone

### Distorted Gravity Room

1. Answers will vary
2. Answers will vary





## Water Works



### Cloud Pusher (2.ESS.1)

1. Look inside the cloud pusher. What do you see inside?

2. Air and clouds are taking up space inside the cloud pusher.

What happens when you push down on the sides and make the space inside smaller?

### Fog Machine (2.ESS.2)

1. Hold your hand in the fog machine for 15 seconds. How does your hand feel when you take it out?

2. Look at the stuff coming out of the fog machine. Write down 2 words that describe how it looks to you.

3. Move the fog out of the basin. How did you get the fog to move? Write your answer or draw a picture.

4. Look inside the fog machine. What do you see inside?

5. Based on your observations, what do you think is the main ingredient in clouds?



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## Water Works

### Hurricane Chamber (2.ESS.1, 2.ESS.3)

Pick an action to test in the Hurricane Chamber, such as jumping up or lifting your arms up from your sides. Test this action at the different wind speeds in the Hurricane Chamber. In the table below, write down your observations.

1. In the Hurricane Chamber, I \_\_\_\_\_  
(write the activity you tested here)

	Wind Type	Maximum Wind Speed (miles per hour)	I noticed... (draw or write your observations)
Trial 1			
Trial 2			
Trial 3			

2. Hurricanes gather their energy from warm ocean water. Is a hurricane likely to form at the North Pole? Why or why not?

### Pier 19 Weather Station (2.ESS.3)

Throughout the year different parts of the Earth get different amounts of sunlight, which results in the seasons. Watch one of the T.V. segments about a season at the weather station.

- Which season did you choose? (circle one)    Spring    Summer    Autumn (Fall)    Winter
- What's the maximum amount of daylight we get during that season?
- What is the weather like during that season?



## Energy Factory

### Spinning Blackboard

1. Set the spinning blackboard to a **low** speed, put some sand on the disk, and draw a design.  
Now, set the spinning blackboard to a **high** speed. What happened to the sand when the speed increased?

### Ring Launcher (2.PS.1)

1. Push the red button. What happens?
  
2. A magnetic force pushed the ring up, and the force of Earth's gravity pulled the ring back down.  
Do objects have to be touching Earth for gravity to pull on them? How do you know?

### Giant Radar Magnet (2.PS.1)

Magnets can pull some objects to them (attraction) or push objects away from them (repulsion).

1. Pull a metal hex nut off of the Giant Radar Magnet.  
How does it feel when you pull the nut away from the magnet?
  
2. Use the metal hex nuts to build a bridge across the gap  
in the Giant Radar Magnet.



## Mind Zone

### Distorted Gravity Room (2.PS.1)

In this room, the feeling that gravity is different is just a trick of the mind.  
Earth's gravity still pulls objects straight toward Earth.

1. Try rolling the ball on one of the shelves. What happens?
  
2. Try dropping a small object. (Make sure you pick it back up and take it with you!)  
Did it drop in the direction you expected it to drop?