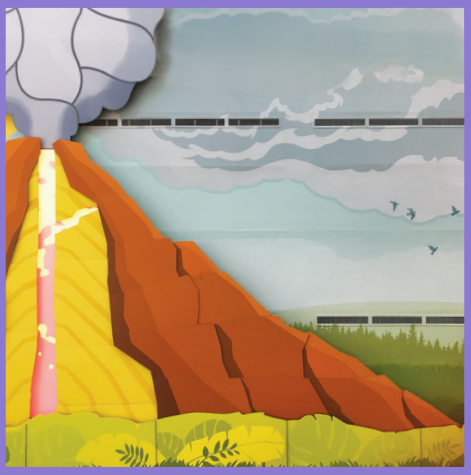
# CONNECTICUT SCIENCE CENTER

# EXPLORATION GUIDE



**CTScienceCenter.org**
250 Columbus Blvd.
Hartford, CT 06103

Connecticut Science Center®

# EARTH: IT'S ALWAYS CHANGING

## Objectives

- Students will be able to identify the major natural processes that change the shape of the earth (wind, water, plate tectonics, volcanos, etc.)
- Students will identify the patterns that occur due to natural earth processes
- Students will recognize that some earth processes can result in hazards for humans that cannot be mitigated
- Students will understand that humans can impact their environment in positive and negative ways

## Overview:

*Getting Started:* This discussion could occur in the classroom, or on the bus ride, when preparing students for the field trip.

*Introduction: What are some ways humans affect their environment? What are some ways natural earth processes impact humans? In what ways can they be harmful? In what ways can they be helpful? Our earth is a dynamic system that is constantly shifting which forces humans to adapt to a changing Earth. Some of these system-wide changes occur in patterns that are trackable and predictable, such as erosion, earthquakes, and volcanic eruptions. Forces, including wind and water, play a major role in shaping the features visible on earth.*

*As we go through the museum today be on the lookout for:*

## Focus Questions:

- What are some of the ways scientists can predict major earth events?
- What processes change the geography of our earth? What effects do these processes have on the land?
- How can natural earth processes be harmful? What can humans do to reduce the impacts of these natural processes?
- How do humans impact the earth? What can humans do to limit their own harmful impact to the planet?

**HINT:** These are great questions to use while exploring the galleries with your group to help them think about weather.

## Visit Debrief

On the bus ride home, or back in your classroom, ask your students to reflect on what they learned:

- As you are on the bus, what do you notice about the land around you? What natural processes might have helped to create these features?
- What are some ways you can think of to reduce your impact on the environment?
- What are some of the natural processes (hazardous and non-hazardous) we experience in Connecticut?
- What connections can you draw between where earthquakes and volcanos are located? Why do you think this pattern exists?

## Concept Summary

- **What are some of the ways scientists can predict major earth events?** Some of Earth's natural processes occur in patterns that are measurable, trackable, and predictable, including volcanic activity and earthquakes. Scientists can track this data overtime using seismic activity and knowledge of tectonic plate boundaries.
- **What processes change the geography of our earth? What effects do these processes have on the land?** Erosion, weathering, glacial activity, and tectonic plate movement all contribute to major earth reshaping. Processes like tectonic plate movement can result in earthquakes, volcanic eruptions, and tsunamis, which shape the land violently and rapidly. Processes such as erosion by wind and water shape the land more gradually.
- **How can natural earth processes be harmful? What can humans do to reduce the impacts of these natural processes?** Events such as flooding, earthquakes, and volcanic activity can pose extreme risk to humans inhabiting the areas in the path of these processes. Loss of crops, homes, industry, and life often occur. To reduce some of these losses humans can evaluate the patterns exhibited by the risks they live near. They can choose to avoid disaster prone areas, look to engineers to design solutions to minimize impacts, or create plans to prepare for the next predicted event.
- **What can humans do to limit their own harmful impact to the planet?** Humans can reduce their impact by using more earth friendly materials, reusing and repurposing materials as much as possible, properly recycling and disposing of materials, and choosing solutions that reduce fossil carbon emissions.

# Next Generation Science Standards

**SCIENCE AND ENGINEERING PRACTICE**
Planning and Carrying Out Investigations
Analyzing and Interpreting Data
Constructing Explanations and Designing Solutions
Engaging in Arguments from Evidence

**DISCIPLINARY CORE IDEAS:**
ESS1 C: The History of Planet Earth
ESS2 A: Earth Materials and Systems
ESS2 B: Plate Tectonics and large-scale systems interactions
ESS2 C: The roles of water in Earth's surface processes
ESS3 B: Natural hazards
ESS3 C: Human impacts on Earth systems

**CROSSCUTTING CONCEPTS:**
Patterns
Cause and Effect

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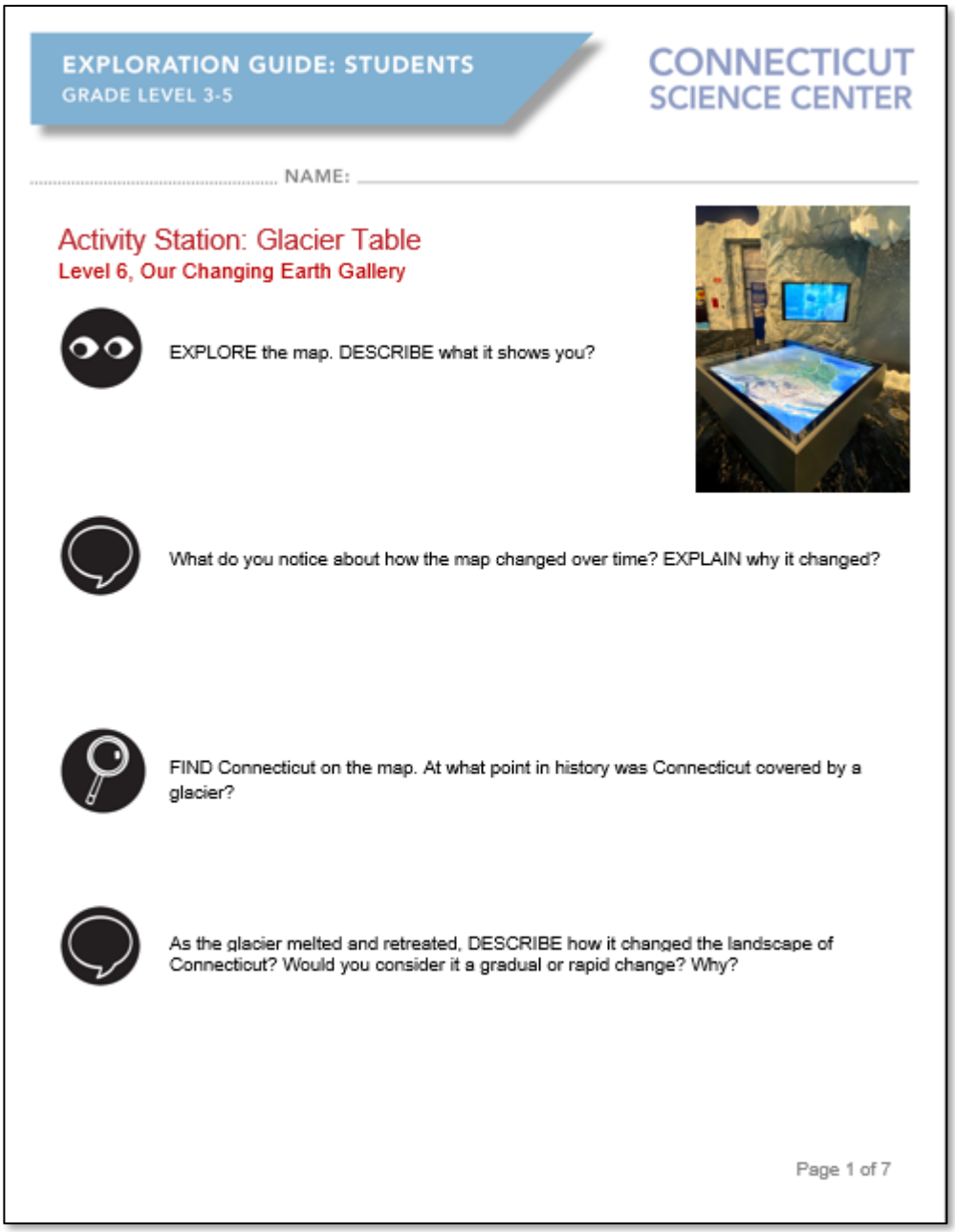

EXPLORATION GUIDE: STUDENTS
GRADE LEVEL 3-5

CONNECTICUT SCIENCE CENTER

NAME: _____

## Activity Station: Glacier Table

**Level 6, Our Changing Earth Gallery**



EXPLORE the map. DESCRIBE what it shows you?

What do you notice about how the map changed over time? EXPLAIN why it changed?

FIND Connecticut on the map. At what point in history was Connecticut covered by a glacier?

As the glacier melted and retreated, DESCRIBE how it changed the landscape of Connecticut? Would you consider it a gradual or rapid change? Why?

Page 1 of 7

**GETTING STARTED:** Chaperones, these activities can be done in any order as you move through the galleries.

**HINT:** Glaciers last covered Connecticut 21,400 years ago. As the average global temperature grew warmer, they melted and retreated to the Artic, shaping the landscape around us today.

**Tip:** Encourage your students to look at the large rock structures in the gallery. They are modeled after actual glacier erratics in CT and nearby.

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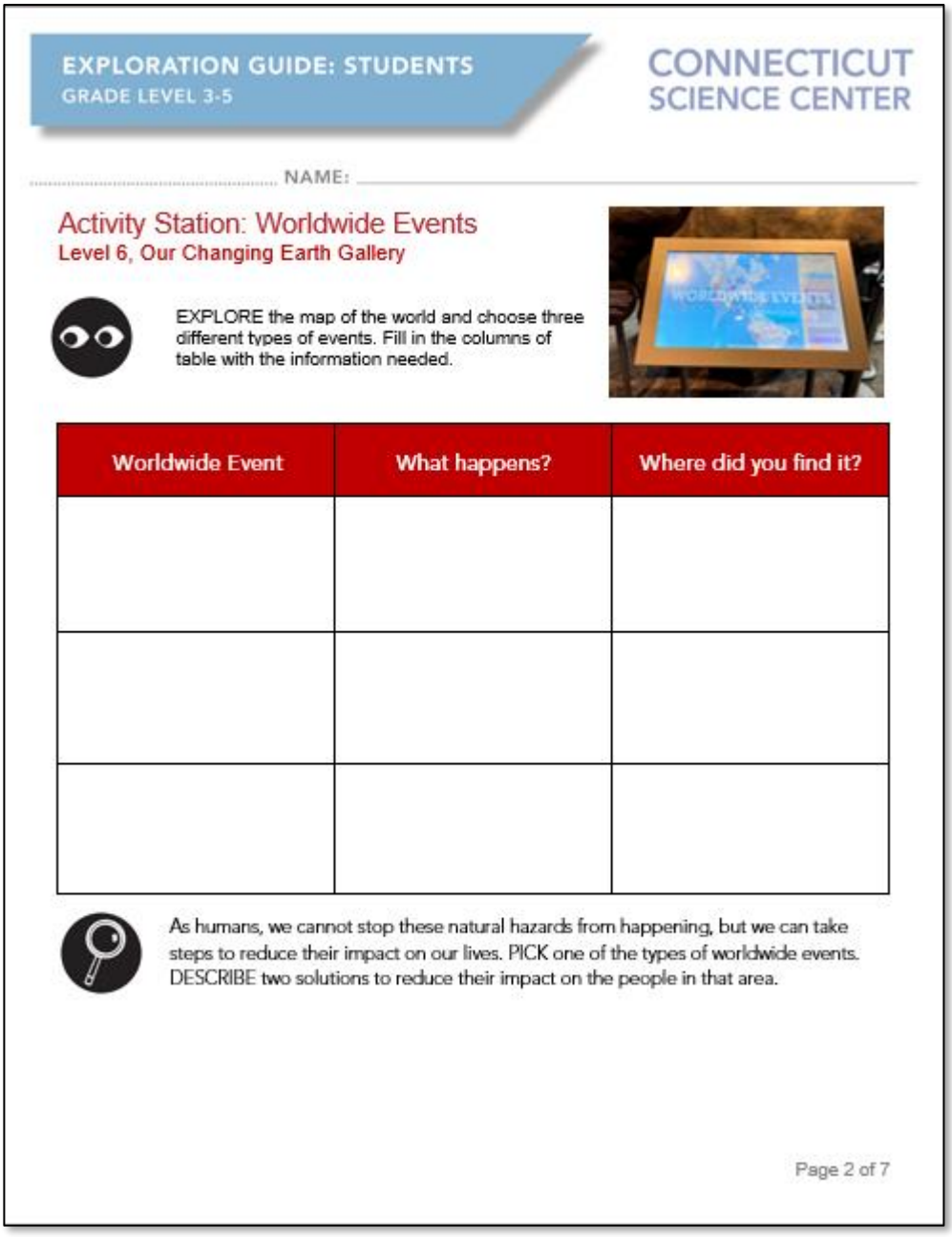

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GRADE LEVEL 3-5

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## Activity Station: Worldwide Events

Level 6, Our Changing Earth Gallery

EXPLORE the map of the world and choose three different types of events. Fill in the columns of table with the information needed.

| Worldwide Event | What happens? | Where did you find it? |
|---|---|---|
| | | |
| | | |
| | | |

As humans, we cannot stop these natural hazards from happening, but we can take steps to reduce their impact on our lives. PICK one of the types of worldwide events. DESCRIBE two solutions to reduce their impact on the people in that area.

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**TIP:** If students tap on the worldwide event bar in the menu on the right side of the screen, more information will open up in the menu.

**HINT:** Examples of solution should match the event. For instance, designing more earthquake resistant buildings near an earthquake or improving monitoring systems of offshore waves near a tsunami are possible examples.

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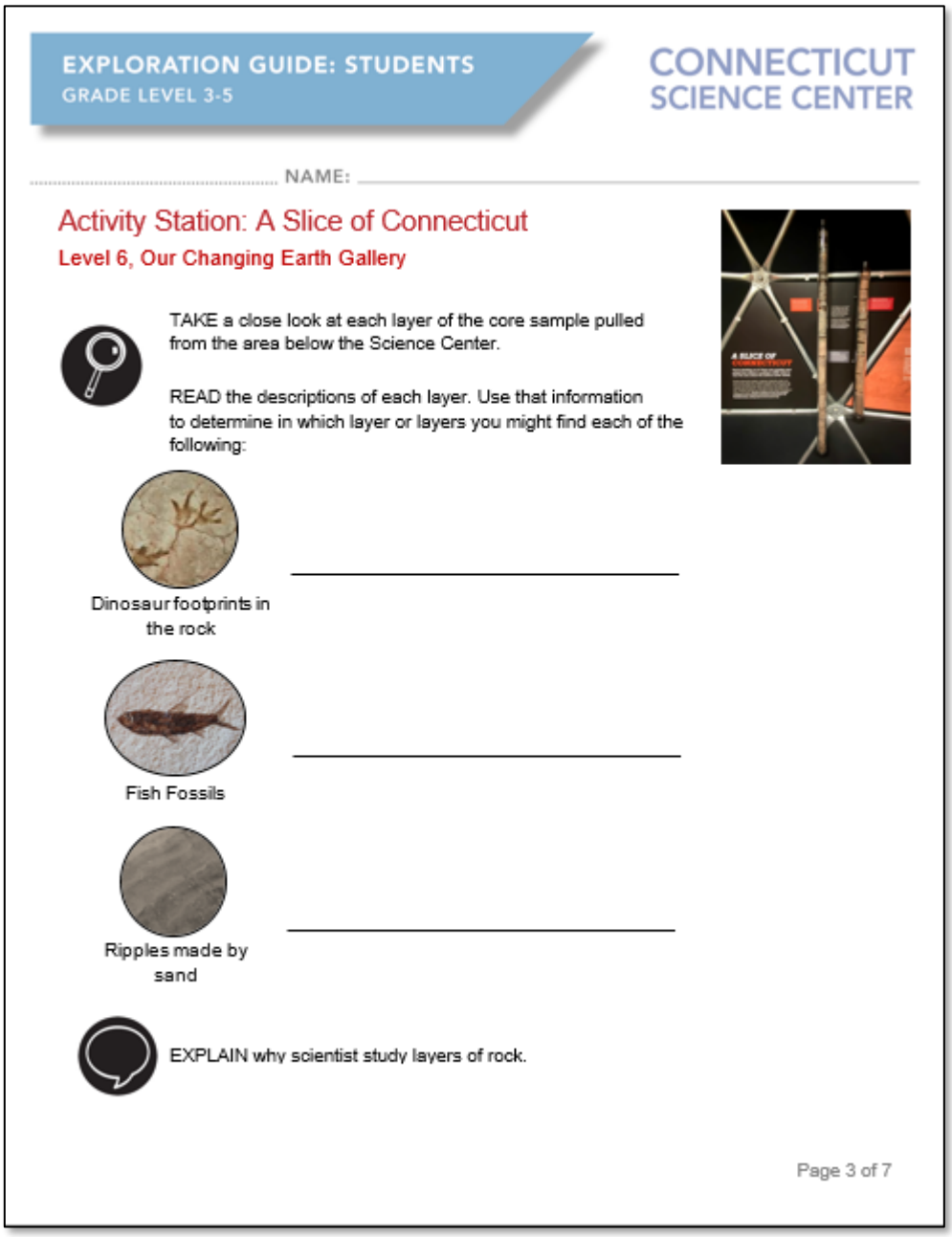

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**Level 6, Our Changing Earth Gallery**



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READ the descriptions of each layer. Use that information to determine in which layer or layers you might find each of the following:



Dinosaur footprints in the rock _____



Fish Fossils _____



Ripples made by sand _____

EXPLAIN why scientist study layers of rock.

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**HINT:** More than one sample layer may have dinosaur tracks. The answer lie in the small descriptive colored labels alongside the core sample columns.

**TIP:** Students can see dinosaur tracks on the large rock piece over by the large animatronic dinosaur at the end of this gallery.

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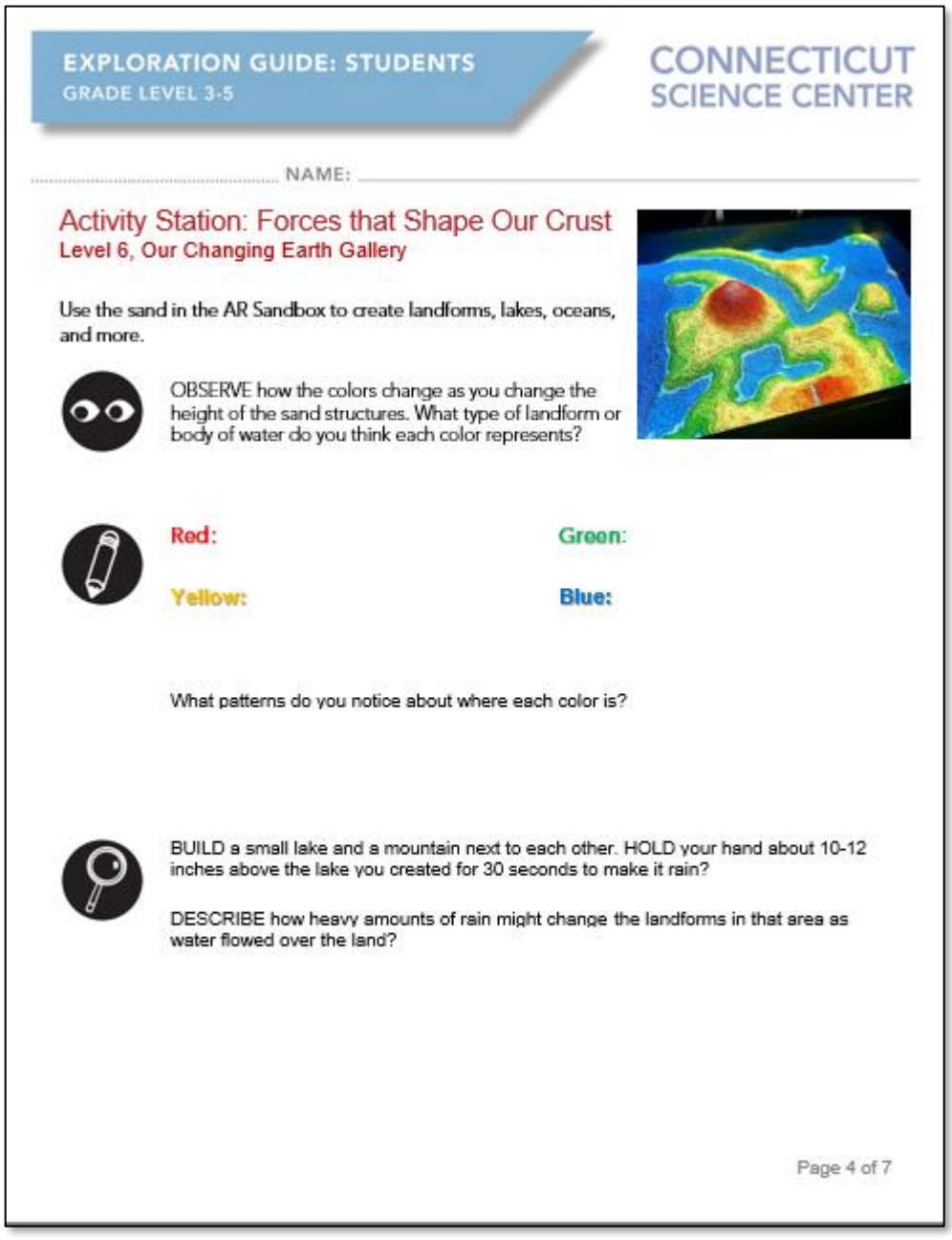

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## Activity Station: Forces that Shape Our Crust

Level 6, Our Changing Earth Gallery



Use the sand in the AR Sandbox to create landforms, lakes, oceans, and more.

OBSERVE how the colors change as you change the height of the sand structures. What type of landform or body of water do you think each color represents?

Red: Green:

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What patterns do you notice about where each color is?

BUILD a small lake and a mountain next to each other. HOLD your hand about 10-12 inches above the lake you created for 30 seconds to make it rain?

DESCRIBE how heavy amounts of rain might change the landforms in that area as water flowed over the land?

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**HINT:** Encourage students to examine which colors (landforms) regularly appear next to each other.

**TIP:** The students need to hold their hands still for a significant amount of time. No other hands or limbs should be below their hand when they try to do this. If successful, blue water will por over the landforms and fill the body of water.

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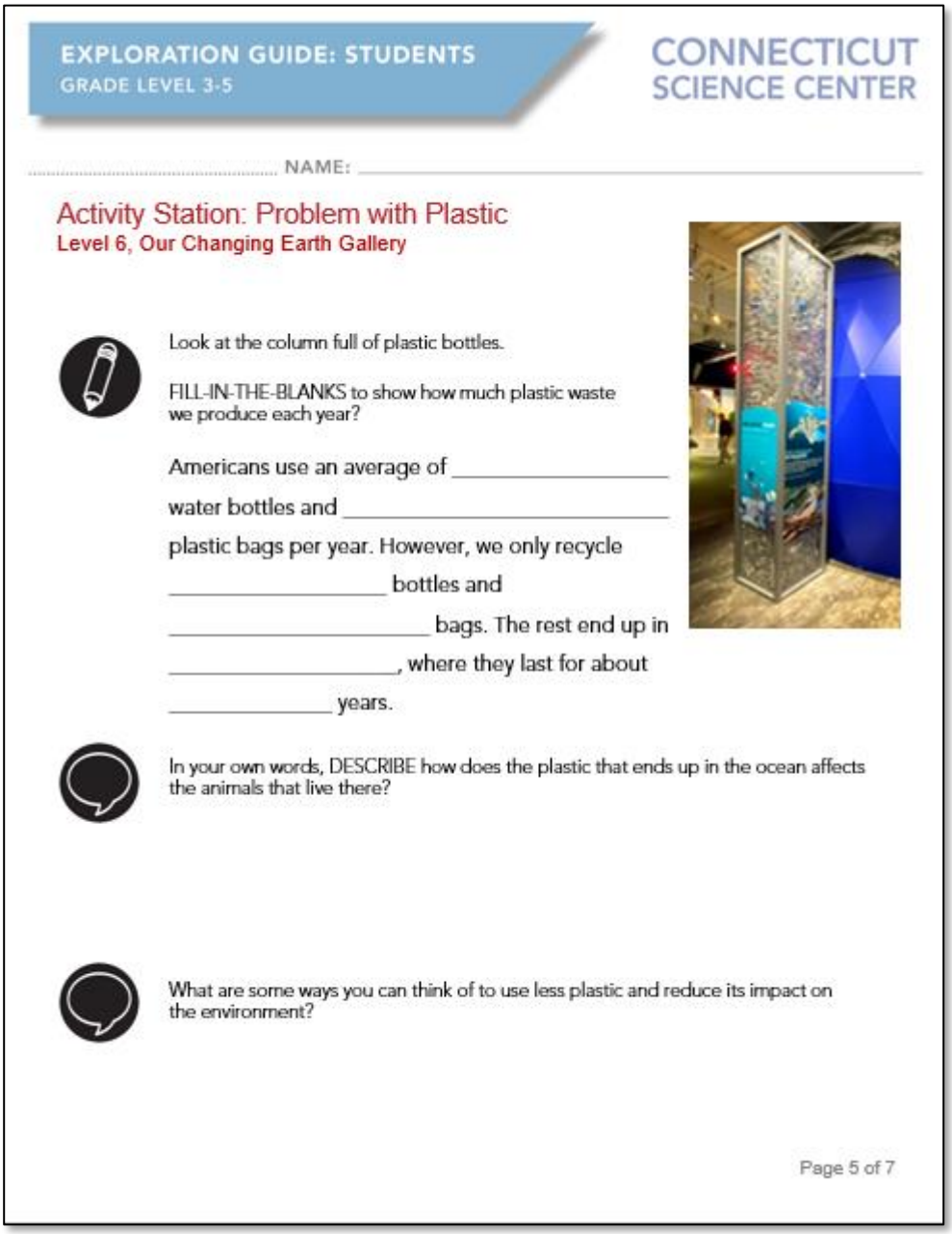

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Look at the column full of plastic bottles.

FILL-IN-THE-BLANKS to show how much plastic waste we produce each year?

Americans use an average of _____ water bottles and _____ plastic bags per year. However, we only recycle _____ bottles and _____ bags. The rest end up in _____, where they last for about _____ years.

In your own words, DESCRIBE how does the plastic that ends up in the ocean affects the animals that live there?

What are some ways you can think of to use less plastic and reduce its impact on the environment?

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**HINT:** Students may take examples from the signage around the column of plastic bottles. Also encourage students to come up with other ways we might be able to reduce plastic waste. Encourage them to talk and brainstorm together.

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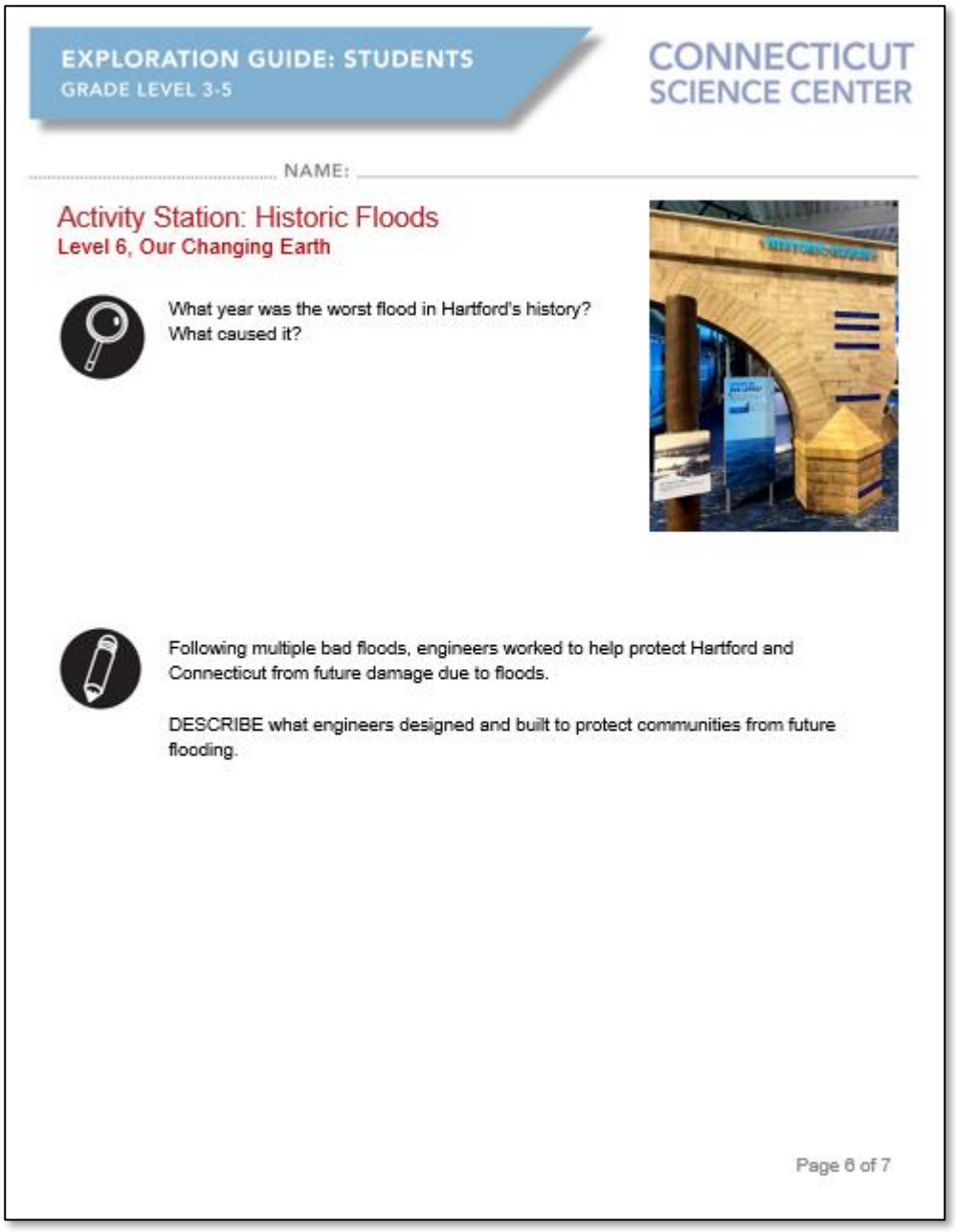

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What year was the worst flood in Hartford's history? What caused it?

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**TIP:** Each of the posts has before and after pictures of historic floods in Connecticut. Students can lift the top panel to see what the area looks like now. Flood markers are also on the bridge.

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## Activity Station: Wind Turbine

Level 6, Energy City

WRITE or DRAW a model to show how a wind turbine works.

How might this technology help reduce human impacts on the environment?

LOOK at the map. PLAN two places where you would place wind turbines based on the map.

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**HINT:** Make sure to have the students focus on which way the turbines are facing. Diagrams should include labels!

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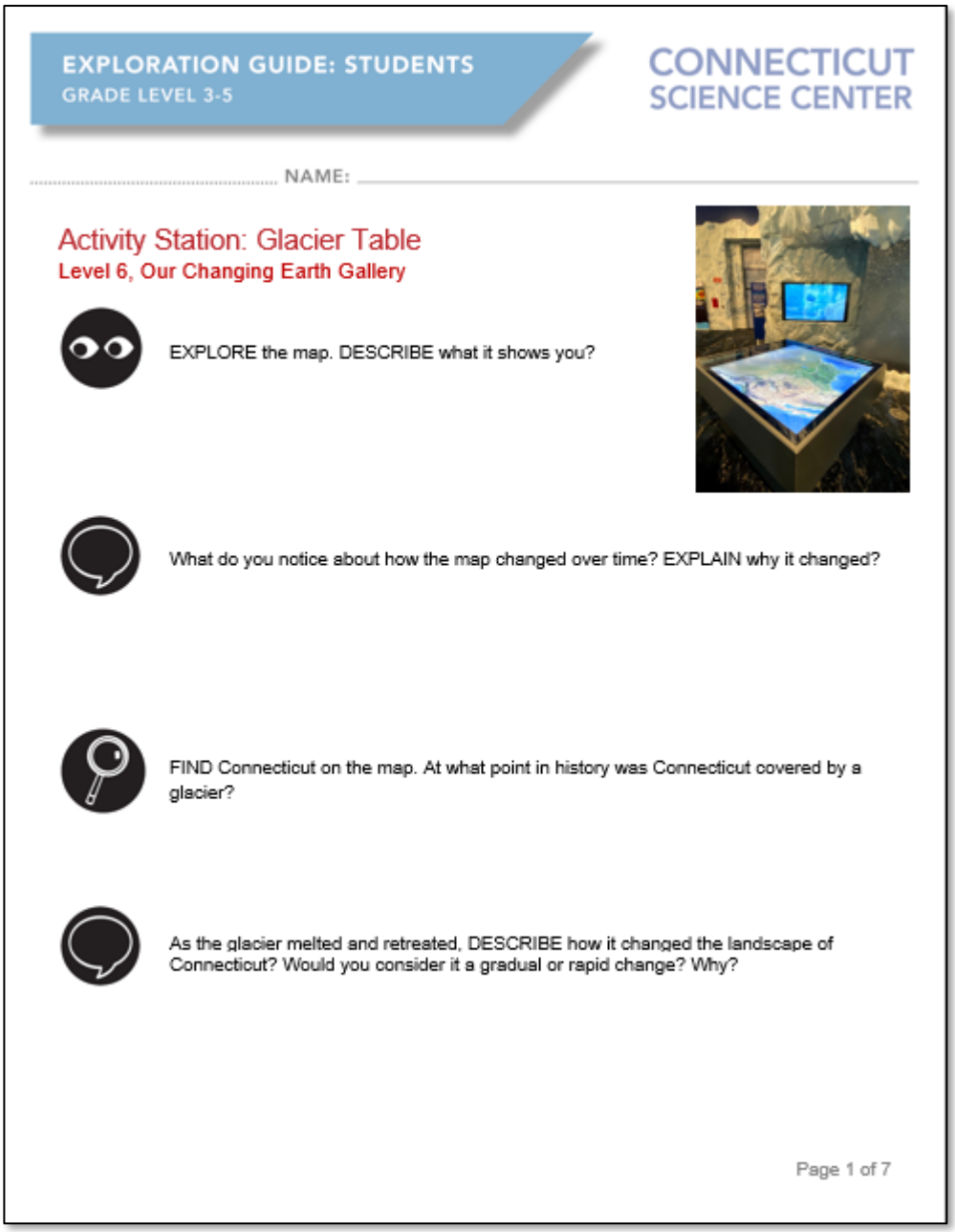

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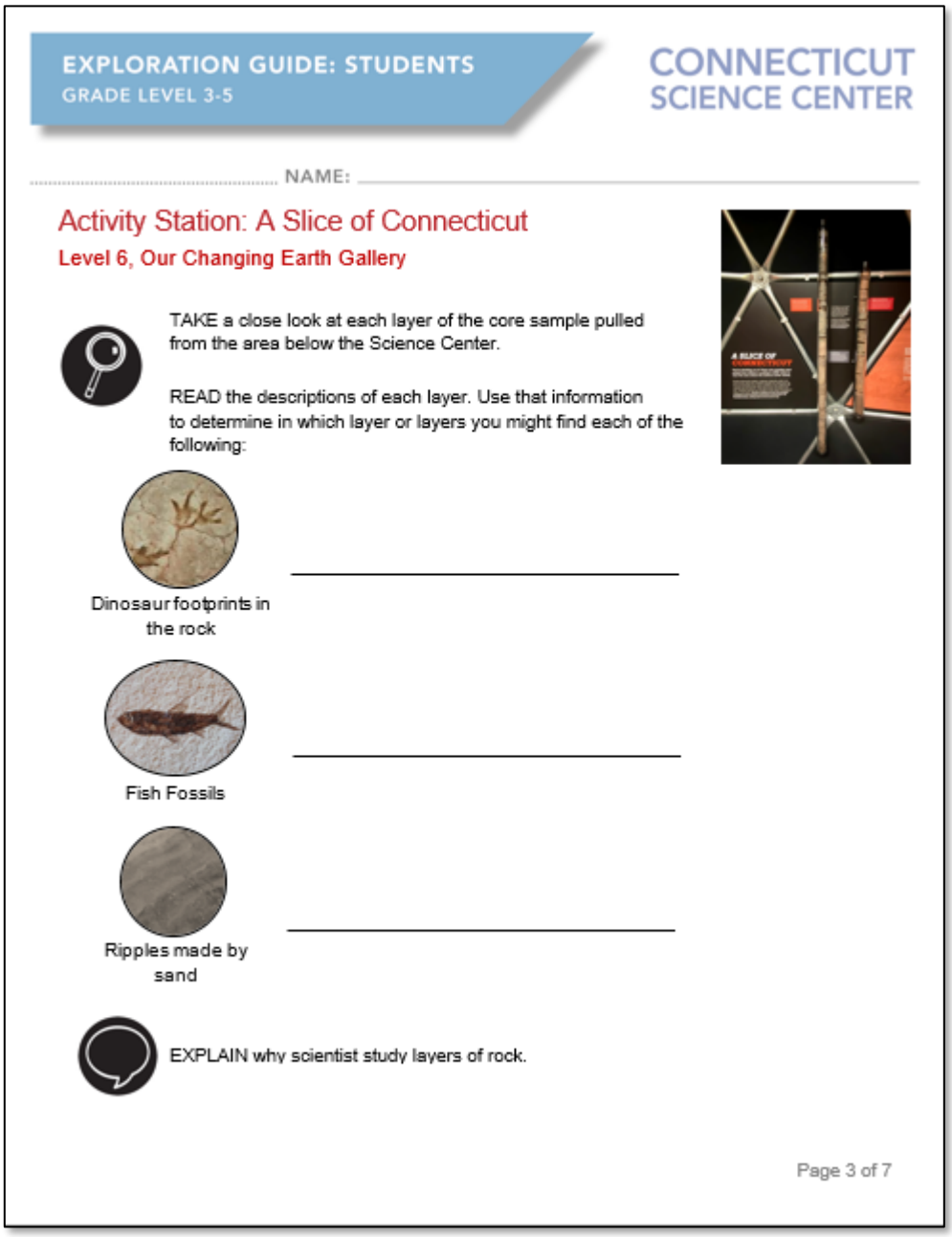

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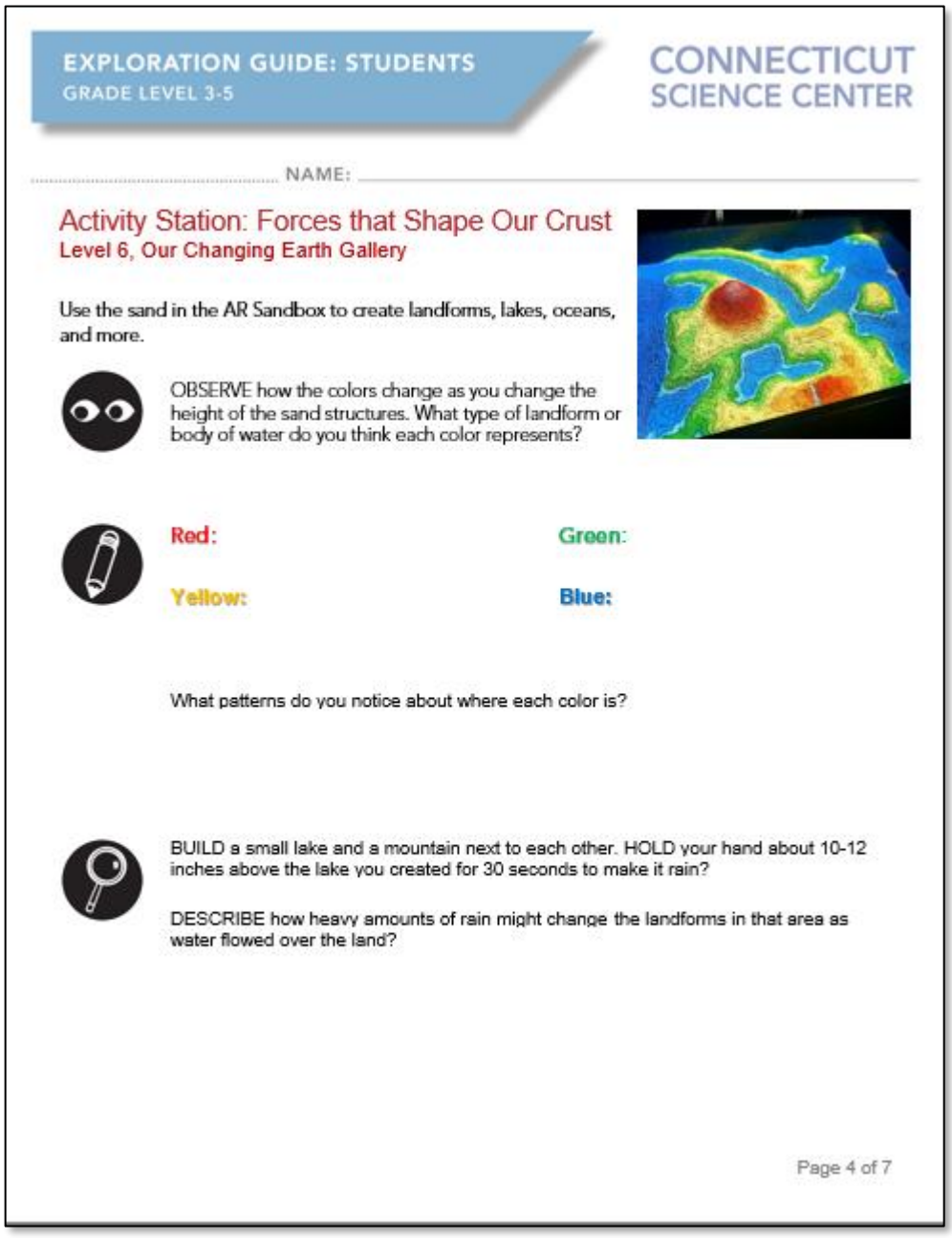

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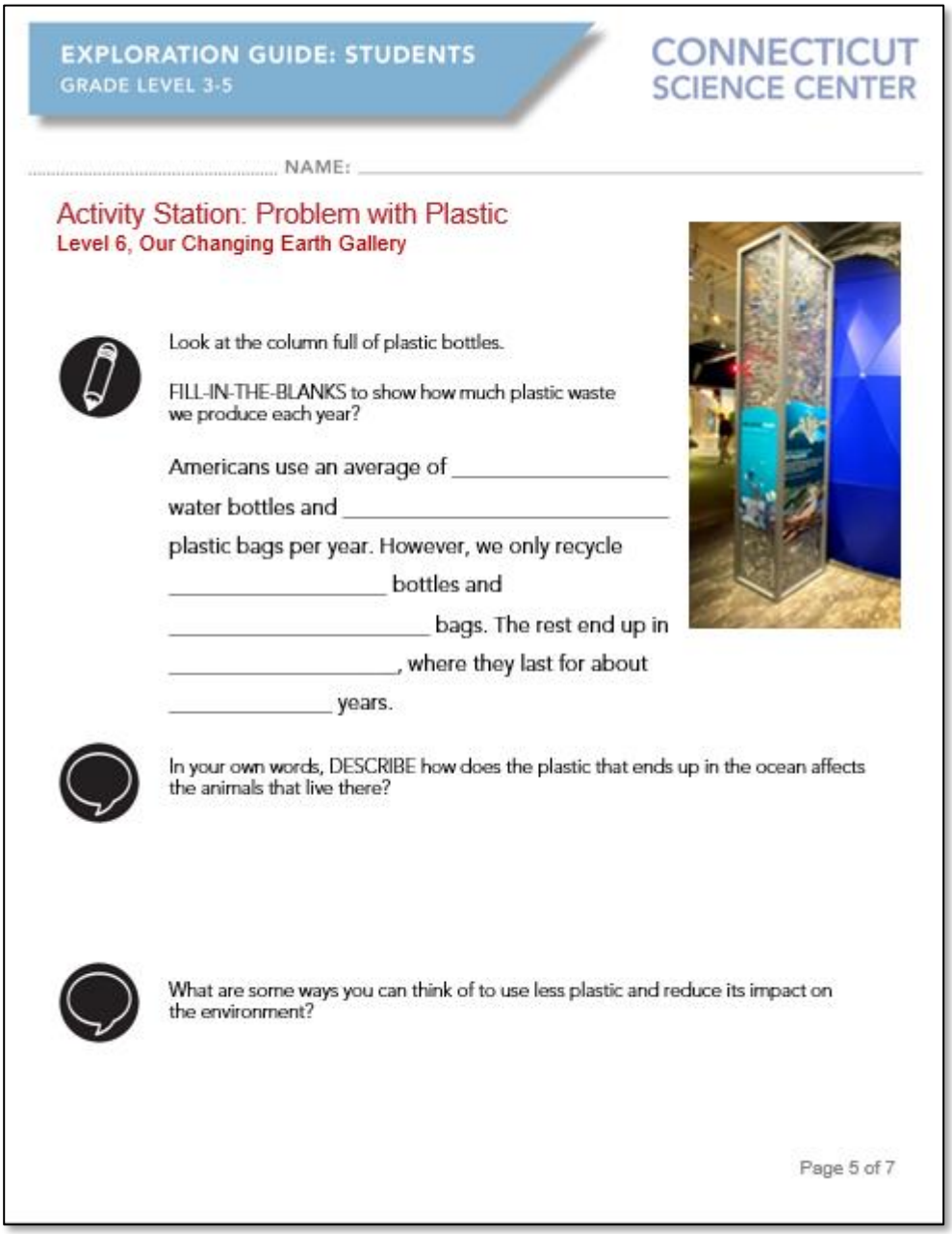

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**Level 6, Our Changing Earth Gallery**



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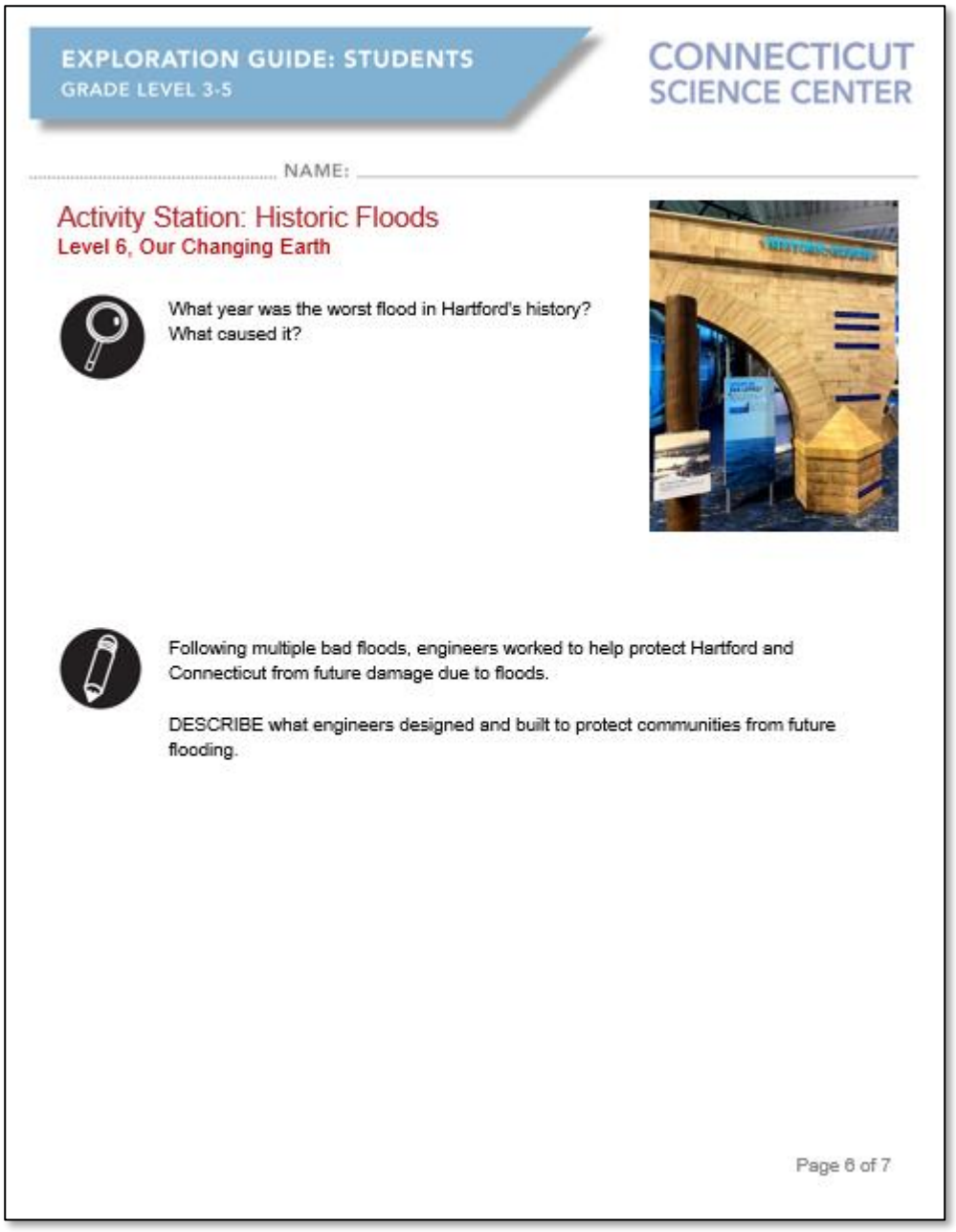

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Level 6, Energy City

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How might this technology help reduce human impacts on the environment?

LOOK at the map. PLAN two places where you would place wind turbines based on the map.

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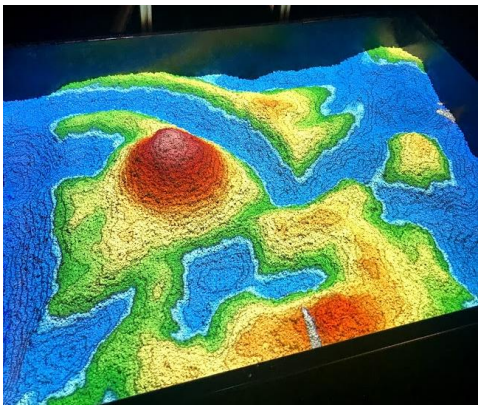
## Level 6, Our Changing Earth Gallery



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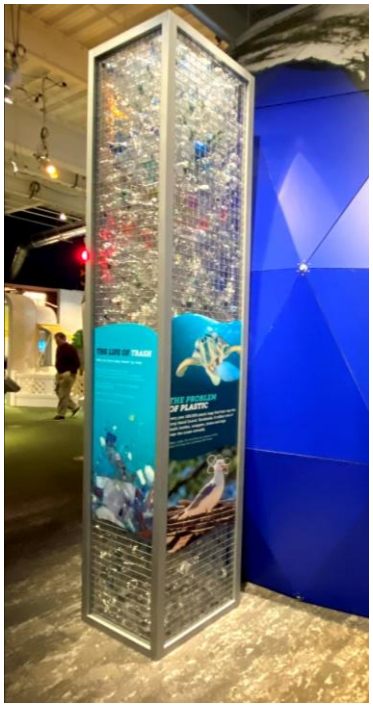

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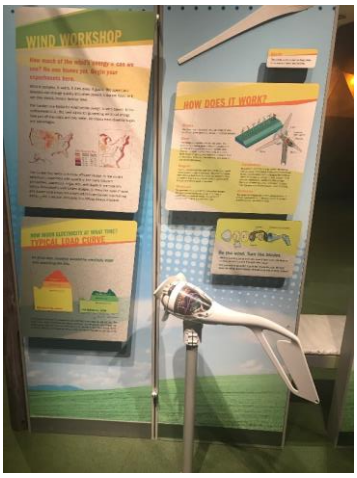


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