

BEFORE YOU VISIT

grades 3-5

These discussion starters and activities are designed to spark your students' interest in the exhibition and to prepare them for the concepts they'll encounter.

Discussion Starters

WEATHER & CLIMATE

- How does the temperature change during the year where we live?
- What's your favorite weather?
- Have you visited friends or family who live in a different climate? How would you have to adapt if you moved there?

OUR ENERGY USE

- Between waking up and leaving home, how many switches did you flip?
- How many other ways did you use energy today?

Tips on Using the Student Worksheet

On the other side of this insert, you'll find a worksheet that your students can use to explore the *Climate Change* exhibition independently.

Before coming to the Museum, you may wish to distribute copies of the **Map of the Exhibition** and point out the areas that students will be exploring.

Activities

ALBEDO EFFECT

Objective: To understand how surface color affects the absorption of energy.

Procedure:

1. Ask students: On a hot summer day, would you want to wear a dark color shirt or a light one? Would it be more comfortable to walk barefoot on dark pavement or a light sidewalk?
2. Divide students into teams. Give each team one piece of white paper, one piece of dark paper, two thermometers, and a Temperature vs. Time chart.
3. Have teams put the two sheets of paper near a sunny window or under a desk lamp, and place a thermometer under each. Ask teams to take temperature readings every minute and record their findings on the chart.
4. Have teams present and compare their results.
5. Ask students: As more and more melting sea ice is replaced by dark ocean water, how might Earth's surface temperature change?

COMPARE LOCAL WEATHER AND CLIMATE

Objective: To understand the difference between weather and climate.

Procedure:

1. Over five days, distribute copies of the weather section from the newspaper or have students visit a weather website.
2. Each day, ask students to record and graph the following data for your area:
 - High and low temperatures
 - Record high and low temperatures
 - Average high and low temperatures
3. At the end of the week, have students analyze and discuss their data. Help them infer that the daily and record temperatures tell us about weather (the condition of the atmosphere at any given place or time), while the average temperatures describe climate (the typical long-term weather in a region from year to year).

STUDENT WORKSHEET grades 3-5

1. Investigate Our Energy Sources

In the **Introduction** area, find the steam engine.
How did coal make the steam engine work?

Find the light bulb. Describe the connection between coal and the “Second Industrial Revolution” in 1882.

2. Investigate Our Energy Use

Find the big chunk of coal in the **Climate Change Today** area. It weighs one metric ton, or 2,200 pounds!
If we burn it to generate electricity, it could ...

... illuminate _____ 100-watt light bulbs for _____

... run a refrigerator for about _____

... produce about _____ of carbon dioxide (CO₂).

3. Investigate Weather and Climate

In the **Changing Atmosphere** area, look for the “Weather vs. Climate” wall.

What’s the difference between weather and climate? _____

Describe the tools scientists use to study weather and climate. _____

4. What Can We Do?

Explore the **Making a Difference** area of the exhibition. On the back of this paper, list some things that you could do at home to save energy and lower your family’s carbon dioxide (CO₂) emission.

Climate Change Educator's Guide

Answers to Student Worksheets

GRADES 3-5

1. Investigate Our Energy Sources

Find the steam engine. How did coal make the steam engine work?

Burning coal boils water, which makes steam. The steam, which is held in a boiler under high pressure, pushes a piston that powers an engine.

Find the light bulb. Describe the connection between coal and the “Second Industrial Revolution” in 1882.

The “Second Industrial Revolution” started when power plants — fueled by burning coal — began bringing electricity to factories, offices, and homes.

2. Investigate Our Energy Use

Find the big chunk of coal in the Climate Change Today area. It weighs one metric ton, or 2,200 pounds! If we burn it to generate electricity, it could . . .

... illuminate **22,000** 100-watt light bulbs for
... run a refrigerator for about **2** years
... produce about **2.5 metric tons** of CO₂ (carbon dioxide).

3. Investigate Weather and Climate

What's the difference between weather and climate?

Weather describes the conditions over the next few days. Climate describes the average weather over many years.

Describe the tools scientists use to study weather and climate.

Scientists use satellites, buoys and floats, and ocean gliders.

4. What Can We Do?

List some things that you could do at home to save energy and lower your family's carbon dioxide emission.

Answers will vary. They may include: Switch to compact fluorescent light bulbs, install energy-efficient appliances, and turn off appliances and electronics when not in use. Take shorter showers. Ride in cars less; instead, ride your bike or take public transportation. In the winter, dress more warmly instead of turning up the thermostat; keep blinds and curtains closed at night and open during the day. In the summer, raise the thermostat to 78°, and turn on a ceiling fan instead of the AC.