

These lessons can be found at :

<http://www.nationalgeographic.com/xpeditions/activities/08/climates.html>

Your Mission

CREATIVE CLIMATES

In a wet, warm, tropical climate like on the island of Savai'i in Western Samoa, there are virtually no distinct seasons and temperatures vary only within a small range.

As head of the new National Geographic Climate Observation Post, you need to create a Climate Map to illustrate the world's different climate zones.

Briefing

Snow in the Sahara? Heat at the Poles? Cold tropics? Talk about disaster areas! Until now, you may have thought that the biggest climatic disaster was global warming. It's true, that's pretty hot stuff, but things could get a whole lot worse if really wacky weather began to occur. As the head of the Climate Observation Post, you'll want to make sure you know all about the world's weather, climate, and climate controls.

There are six climate zones in the world: tropical, dry, mild, continental, polar, and high elevation. Within each zone are further distinctions that indicate a more specific type of climate.

Now that you're ready, create your own illustrated climate map and match wits with the weather! Using the climate map as a guide, print out a world map and photographs of four of the world's climate zones. Use the photographs to illustrate your climate map, and color in the climate zones with shades that seem right to you. You might want to use blue for polar regions, for instance, or red for desert regions.

As an **Xpedition Xtra**, highlight the lines of latitude on your map. What do you recognize about the climate zones and their relationship to latitude?

FAMILY - X FILES

Younger Xpeditioners: Think about the weather where you live. During the year, do there tend to be comfortable temperatures most of the time or extremes of hot and cold? A lot of rain or snow, or a little? Ask an older person to help you learn what the weather is like in a city or town far away. Why do you think the weather is different there? Is one of the two places

far to the north or south, high in the mountains, or near an ocean? Draw two pictures of yourself, one where you live now and then another showing what you would wear or do if you lived in that other place.

As an **Xpedition Xtra**, do you think there are some animals that live where you do but couldn't live in that other location? Add pictures of local animals to your two drawings.

Older Xpeditioners: Keep track of the weather for a week in your hometown and in five other cities: Cairo, Egypt; Nome, Alaska; Sydney, Australia; Moscow, Russia; and Manaus, Brazil. (Check www.nws.noaa.gov or www.weather.com for weather information.) On a world map locate all six locations. Which had the least and the most precipitation (rain or snow)? Which had the highest and lowest average daily temperatures? Identify the climate zone for each location.

How does the climate in which you live affect how you live? Does it influence how you spend your time, like being outdoors or indoors? Does it affect what people do for a living?

Parents: Identify your climate zone. If you've ever traveled away from your home, talk to your kids about a different location's climate and weather. Discuss why some places are popular destinations for summer or winter vacations. Have you ever made a decision about whether to travel to a location based on its climate? Also, talk about how the climate might affect how you live or what you do for a living.

Explore the positive aspects of climate and weather as well as those that are disastrous or inconvenient to human beings. Different climates encourage biodiversity, and it's important to reinforce that weather affects more than just people. For example, at certain times of the year, rain is a necessity—not a nuisance—even if a softball or soccer game gets rained out.

WEATHER COMPLAINTS Grades 3-5

Overview:

This lesson asks students to consider the weather and climate in their home region and to think about the ways in which people complain about the weather. Students will refer to a climate map to predict what the climate might be like in specified United States cities. They will then find out those cities' average temperatures and precipitation by using a weather Web site. As a final project, students will write statements that people in these cities might make to describe their weather and climate.

Connections to the Curriculum:

Geography, social studies

Connections to the National Geography Standards:

Standard 8: "The characteristics and spatial distribution of ecosystems on Earth's surface"

Standard 15: "How physical systems affect human systems"

Time:

One to two hours

Materials Required:

Computer with Internet access

World climate map

Globe

Story about an extreme weather scenario temperature/precipitation chart for major U.S. cities (available online)

Objectives:

Students will

describe the weather complaints they have heard other make or they have made themselves;

predict the weather in specified cities, based on information at a climate map;

use the Internet to find out the average temperatures and precipitation for these cities;

determine the months in which each of these cities experiences the most extreme weather, and compare that weather to the climate of their home region; and

write statements that people might make about the weather in their cities

Geographic Skills:

Asking Geographic Questions

Acquiring Geographic Information

Organizing Geographic Information

Answering Geographic Questions

Analyzing Geographic Information

S u g g e s t e d P r o c e d u r e

Opening:

Ask students if they have ever heard people complaining about the weather or if they have ever complained about the weather themselves. What types of complaints do they hear in their area? Who tends to complain more—adults or kids? Do they always agree with their parents about whether the weather is a problem?

Development:

Show students the world climate map, and explain to them what the colors

on the map show. Also explain that average temperature decreases as latitude increases. You might want to have them look at a globe to better understand this concept.

Point out the locations of the following cities on the map: Phoenix, Seattle, Chicago, Miami, Anchorage, and their town. Have students predict what the weather might be like in each of these cities based on what they have seen on the climate map.

Help students find out the temperatures and precipitation for these cities in the winter and summer. They can find this information at the Weather Channel site.

Have older students write the average high and low temperatures and precipitation for January and July on their own paper. For younger students, write the average high temperatures for January and July on the board and record the month in which each city gets the most rainfall and the amount of rainfall that occurs during this month.

Closing:

Help students compare the cities to each other and to their own town. Have students determine the month (January or July) in which each of these cities experiences the most extreme weather (e.g., January in Anchorage or July in Phoenix). This might be open to some debate—many people consider Chicago too cold in January and too hot in July!

Suggested Student Assessment:

Have students write statements that people might make about each city when they complain about that city's weather. For example, someone in Phoenix in July might say, "It's so hot, I can't leave my house," and someone in Seattle in January might say, "I'm so tired of all this cold rain!" Inform students that not everyone in these places complains about the weather, and many people like what is generally considered extreme weather or enjoy spending time indoors during periods of bad weather. There must be some good things about the extreme weather in the off-season.

Extending the Lesson:

Have students write additional statements and/or draw pictures describing the things that they would recommend people in these cities do to make the most of their weather situations. What would students like to do in these cities if they were there when the weather wasn't ideal?

Related Links:

National Geographic: Xpeditions Activity—Creative Climates
Weather.com

Overview:

This lesson has students consider how various parts of the world and the United States are affected by climate controls such as world air currents. They will read about climate controls and will create maps showing how these controls affect the climate in various places around the country.

Connections to the Curriculum:

Geography, science

Connections to the National Geography Standards:

Standard 8: "The characteristics and spatial distribution of ecosystems on Earth's surface"

Time:

Two to three hours

Materials Required:

Computer with Internet access

Wall map of the world

Blank Xpeditions outline map of the world (one per student)

Objectives:

Students will

read and discuss the Climate Controls section of the Creative Climates activity;

use outline maps to label areas that might be affected by climate controls; and

create maps of specific places in the United States and write captions to show how each of these places might be affected by climate controls.

Geographic Skills:

Asking Geographic Questions

Organizing Geographic Information

Analyzing Geographic Information

S u g g e s t e d P r o c e d u r e

Opening:

Have students read the Climate Controls section of the Creative Climates activity, and hold a brief class discussion on the different types of climate controls that are mentioned, using a world wall map as a reference.

Development:

Give each student a blank world outline map. Have them refer to the video clip of world air currents in the Family Xpeditions Xtras section of Creative Climates, and a physical world map (available at MapMachine). Ask them to mark areas on the outline map that they think might be affected by the climate controls they have read about (except for latitude, which is the

obvious one).

After students have had a chance to label some places on their own, discuss what they've done and ask them to label the following places in the United States that are definitely affected by climate controls: coastal California, California and Nevada deserts, the Rocky Mountains (and other mountain ranges).

Closing:

Have students look carefully at their maps, and discuss the ways in which they think each of the regions they have mapped is affected by climate controls.

Suggested Student Assessment:

Ask students to write captions to go with their maps describing the factors that control the climate in each place they have labeled. As an option, have students research one or two of these places to find out about the effects of the climate controls on vegetation, animals species, and human life in these areas.

Extending the Lesson:

Have students look at the world climate map and predict what the weather might be like in the following cities: Juneau, Alaska; Riyadh, Saudi Arabia; St. Petersburg, Russia; and Jakarta, Indonesia. Then have them research these places on the Internet and/or in print materials to see if their predictions were accurate. Ask them to find out about each city's weather, including its temperature, precipitation, wind patterns, and seasonal variations.

Related Links:

Envirolink

National Geographic: Xpeditions Activity—Creative Climates

WEATHER AND AGRICULTURE grades 9-12

Overview:

Students will research, discuss, and write reports on the relationship between climate and agriculture. They will pretend that they have just purchased farms in specific parts of the United States and will investigate that region's weather and climate in order to maximize the chances that their farms will succeed.

Connections to the Curriculum:

Geography, science, current events

Connections to the National Geography Standards:

Standard 8: "The characteristics and spatial distribution of ecosystems on the Earth's surface"

Standard 14: "How human actions modify the physical environment"

Standard 18: "How to apply geography to interpret the present and plan for the future"

Time:

Two to three hours

Materials Required:

Computer with Internet access (recommended)

Objectives:

Students will

- discuss the relationship between climate and agriculture;
- pretend they have just purchased farms, and research the weather and climate factors they would need to consider in order to successfully run their farms; and
- write reports describing the climate-related factors they would need to understand when running their farms.

Geographic Skills:

Acquiring Geographic Information
Organizing Geographic Information
Answering Geographic Questions
Analyzing Geographic Information

S u g g e s t e d P r o c e d u r e

Opening:

Hold a class discussion on students' current understanding of the relationship between climate and agriculture. What types of crops grow in different parts of the country, and how does climate affect the decision to grow crops in different regions? How are farmers affected by climatic variations such as drought, flooding, and early frosts?

Development:

Ask students to imagine that they have decided to purchase a farm. They will need to ignore the fact that this might be a rather impractical ambition and assume that they have the skills, finances, etc., to operate a farm. Have each student choose a specific agricultural area of the United States in which to buy their farm (some examples are Vermont, Wisconsin, Nebraska, or California's central coast). Ask them to research the climate of the area, paying particularly attention to temperatures, precipitation levels and patterns, and the length of a typical farming season. Also have them find out how weather and climate affect farmers in general. Have them answer the following questions:

- What are the average high and low temperatures in January and July?
- Is there a period of the year when the farm will need to be fallow (e.g., the coldest parts of the winter)?
- What is the average annual precipitation?

When does this region get most of its rainfall?

How does weather affect other factors that are important for operating the farm, such as insect reproduction, types of crops that will thrive, etc.?

What will be your greatest weather-related concerns? How will the weather affect your operations?

The following Web sites may be helpful:

Agriculture.com Weather Page USDA Joint Agricultural Weather Facility
The Weather Channel

Closing:

Hold a closing class discussion on students' research findings. What interesting things have they learned about agriculture and climate? If they were farmers, what would they need to keep in mind about climate and weather in order to ensure the success of their farms?

Suggested Student Assessment:

After students have conducted their research, have them write reports describing the specific weather- and climate-related issues they will need to be aware of when running their farms.

Extending the Lesson:

Ask students to discuss how farmers might be affected by global warming. What might happen to farming in the United States and other parts of the world as the climate becomes warmer? Who would benefit, and who would suffer? They can research trends and predictions in the world climate at the following Web sites:

National Climatic Data Center Pew Center on Global Climate Change
Spotlight: Climate Change Warnings from the Ice

Related Links:

National Geographic: Xpeditions Activity—Creative Climates
Pew Center on Global Climate Change

National Oceanic and Atmospheric Administration <http://www.noaa.gov> A rich source of national and global weather and climate information.

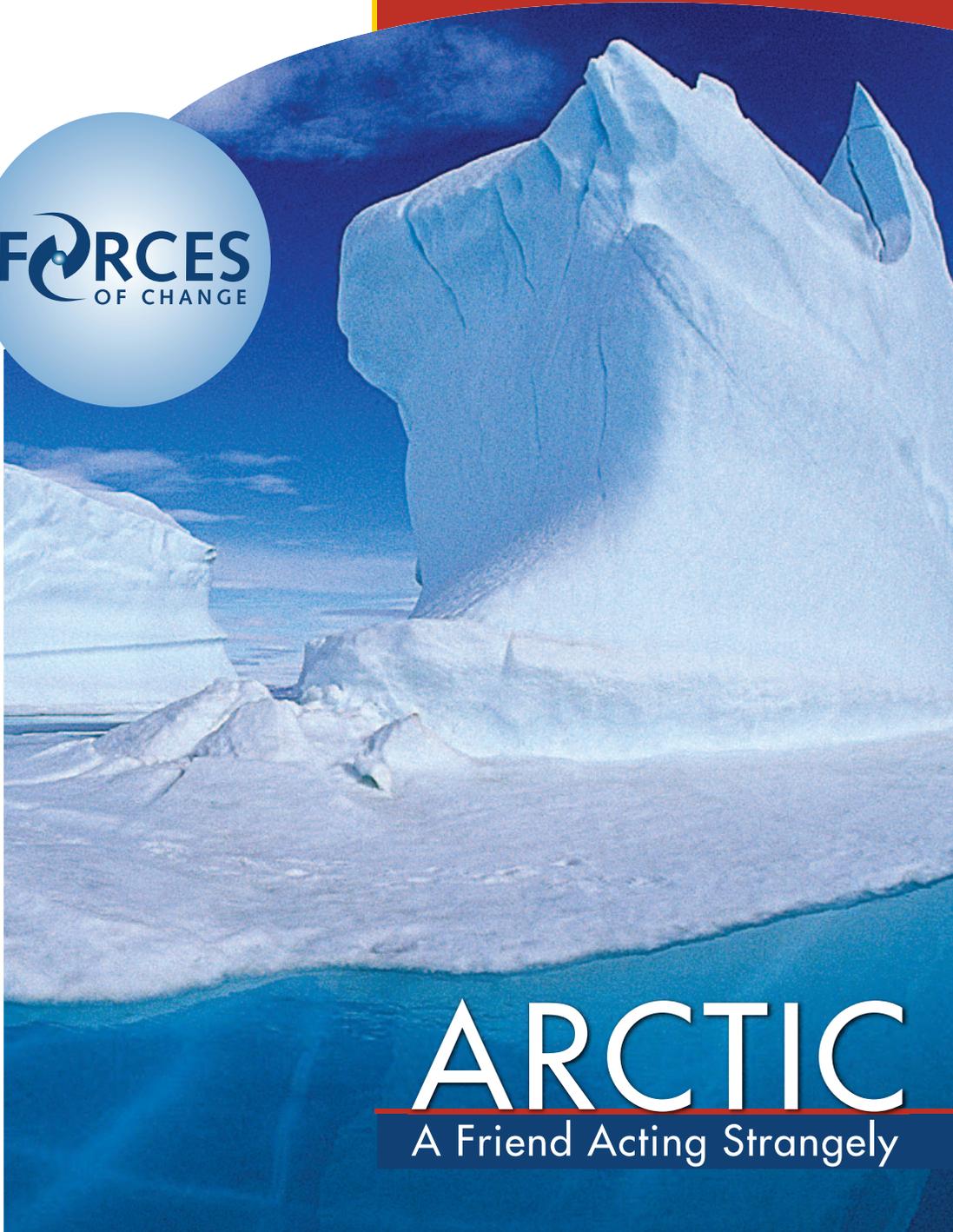
National Climatic Data Center <http://www.ncdc.noaa.gov> A vast archive of global climate data.

Weather.com <http://www.weather.com> The Web site of The Weather Channel.

EnviroLink <http://www.envirolink.org> A good starting point for environmental information on the Web with a comprehensive list of links.

Pew Center on Global Climate Change <http://www.pewclimate.org> Reports and policy analyses addressing key issues in the debate on climate change.

Activity 2
Changes Close to Home



ARCTIC

A Friend Acting Strangely



Smithsonian
National Museum of Natural History

ACTIVITY 2

CHANGES CLOSE TO HOME

ORAL CLIMATE HISTORY PROJECT

Documenting Cultural Knowledge, Savoonga, Alaska

Smithsonian ethnographer, Dr. Igor Krupnik, consulted and interviewed community members like illustrator Vadin Yenani (*right*) and elder Chester Noongwook (*left*) to create the Yupik "Sea Ice Dictionary."

Photo Igor Krupnik © Smithsonian Institution

**OVERVIEW**

Students use interview techniques to explore perceptions about local climate change among long-time residents of their community. Students then compare the results of their interviews to 30-year local temperature and precipitation records.

SUGGESTED GRADE LEVEL

6 – 8

ALIGNMENT WITH NATIONAL STANDARDS

National Science Education Standards

- Abilities necessary to do scientific inquiry
- Structure of the earth system
- Earth's history
- Understandings about science and technology
- Populations, resources and environments
- Natural hazards
- Science as a human endeavor
- Nature of science

ESTIMATED TIME

- Three 45-50 minute class periods (over the course of several weeks)
- One to two weeks for students to conduct surveys
- One 45-50 minute class period (Extension Activity)

MATERIALS

- Access to the Internet
- Activity Sheet B
- Activity Sheet C
- Activity Sheet D
- Transparency of *Fig. 2.1*
- Overhead projector
- Graph paper

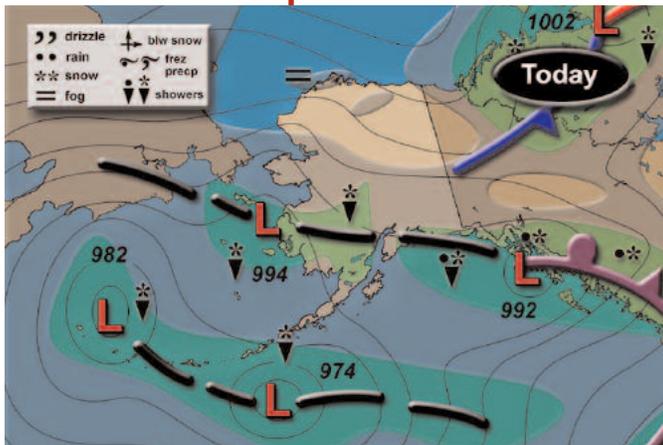
ACTIVITY 2

OBJECTIVES

Students will be able to:

- 1 > Demonstrate appropriate use of tools and techniques to gather, analyze and interpret data.
- 2 > Compile and summarize community survey results on local climate change.
- 3 > Communicate results of their investigations.
- 4 > Use a climate data base.
- 5 > Explain the difference between weather and climate.

BACKGROUND



National Weather Service Forecast Map

Courtesy of National Oceanic and Atmospheric Administration (NOAA)

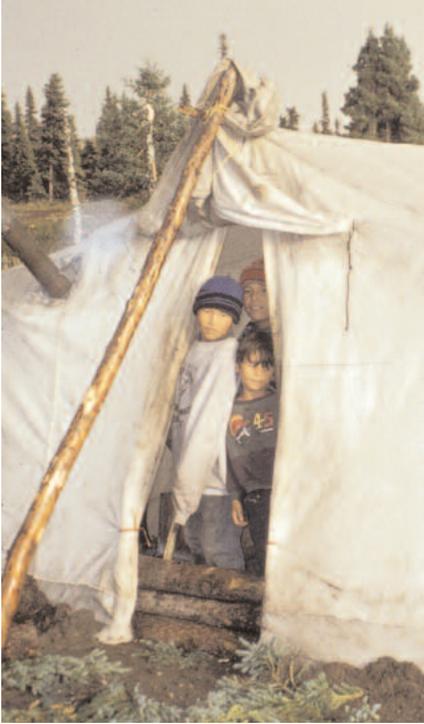
Changes in climate and changes in the weather do not mean the same thing. Weather can be highly variable—changing from hour to hour and day to day. Climate is relatively stable. It changes more slowly and over a longer period of time.

“Weather” describes what’s happening outside: What is the weather like today? A sunny day is weather, a rain drop is weather. Weather describes the state of the atmosphere at a specific time and place.

“Climate” is the average weather in a location over a long period of time: Miami has a warm climate. Seattle has a rainy climate. Buffalo has snowy winters. Climate tells us what the weather is usually like in a particular place. It helps us understand the weather where we live.

Climate change is a long-term alteration in the average weather conditions for a particular location. To evaluate whether or not climate has changed, scientists study historical weather records. In general, scientists use records from the past 30 years to compile “average” weather.

ACTIVITY 2



Innu Hunting Camp Kamestastin, Labrador

Smithsonian anthropologist Dr. Stephen Loring interviewed Innu children, like those pictured here, as he conducted community archaeology projects with both the Inuit and Innu in northern Labrador.

Photo Stephen Loring © Smithsonian Institution

Teacher note: *The survey form was adapted from one developed by the Union of Concerned Scientists and can be viewed at http://www.climatehotmap.org/curriculum/climate_change_guide.pdf.*

PROCEDURE

STEP 1 > Engage students with the following questions and discussion.

- 1 > Ask students to describe the weather during the past week. Would a description of one week's weather be adequate to describe the climate where they live? Why or why not? How do weather and climate differ.
- 2 > How much would they say their lives are affected by climate? List ways their climate can affect them. (Winter snows can cause school to close. Rains can trigger mudslides. Spring rains can flood the softball field. A mild climate allows me to bike year-round. A hurricane caused us to be without electricity for several days. A warm climate allows me to swim outside year round, etc.).
- 3 > What, if any, changes have they observed in the climate since they were old enough to go to school? How do they think their observations would compare with observations by older people in their community?

STEP 2 > Explain survey process.

- 1 > Tell students that each one (or a pair of students) will interview three long-time residents of the community. The interview subjects should have lived in the community for at least two or three decades. Discuss why they are surveying long-time residents. (Climate is a long-term record of weather.)
- 2 > Discuss who they might consider interviewing. (Subjects could include teachers, family members, and neighbors. Teachers might consider contacting a local senior citizen center where students could conduct their interviews. Teachers should collect names of intended interview subjects ahead of time to verify that each student has a different interview subject.)
- 3 > Emphasize that the subjects they interview should remain anonymous.
- 4 > Distribute and discuss the survey (*see note*) form on **Activity Sheet B**. Delete questions that are not relevant to your area. Add questions if they like. (Alternatively the class can design its own form.)
- 5 > Distribute **Activity Sheet C**. Students summarize the results of their interviews on this form. It is very important that students understand Part 3 on **Activity Sheet C**. Here, they calculate the average for the number of years their three subjects lived in the community. Students will need this number to complete the exercise in Step 3 on page 3.
- 6 > Give students a week or so to conduct their interviews and summarize their data.

ACTIVITY 2

Teacher note: *If students do not have access to the Internet, you can download the data and provide it to them.*

See Teacher Reference #1

STEP 3 > Interpret historical weather records and compare with survey responses.

- 1 > Tell students they will use the Internet to acquire historical weather records for their city. They will be using this data to determine if the results of their surveys agree or disagree with actual changes in climate over the same time period.
- 2 > Explain that the data they use will be annual mean (average) temperature and precipitation records. Review the term “mean.” A mean is computed by summing the values and dividing by the number of values. The arithmetic mean is commonly referred to as an “average.”
- 3 > Distribute **Activity Sheet D**.
- 4 > Go over “Directions for Accessing Weather Records” from the Internet (*below*). Either make copies for the students or use a projector to show the entire class on a projection screen.
- 5 > Repeat above steps and select “Precipitation.” Print the data on the “Climate at a Glance Table” for annual mean precipitation
- 6 > Use data to complete **Activity Sheet D**. With the data they access, the students calculate an average for the first ten years in the record and an average for the last ten years in the record. They then calculate the difference between the two averages. They complete this exercise for both annual average temperatures and average annual precipitation.

DIRECTIONS FOR ACCESSING WEATHER RECORDS

Go to www.ncdc.noaa.gov/oa/climate/research/cag3/cag3.html . Click on “Cities.” The site stores historical weather records for approximately 60 cities. Available cities are indicated on the map and listed on the left-hand side of the page. Click on the city closest to your community. A dialogue box appears. (*sample below*)

Data Type:	Select “Mean Temperature”	Base Period:	Enter same year as “First Year to Display”
First Year to Display:	See Activity Sheet C	Location:	leave as the default
Period:	Select “Annual”	Output Type:	Select “Table”
Last Year to Display:	Select the current year, i.e. 2006	Click “Submit”	

Print out the data on the “Climate at a Glance Table” for annual mean temperatures.

Data Type : Mean Temperature ▾	First Year to Display : 1948 ▾
Period : ▾	Last Year to Display : 2006 ▾
Location: ▾	Base Period: BegYr: 1948 ▾ EndYr: 2006 ▾
Output Type: <input type="radio"/> Line Chart* <input type="radio"/> Bar Chart* <input type="radio"/> Plot Trend Line <input type="radio"/> No Trend Line *A minimum of 8 years is required to generate chart output.	
Sort by: <input checked="" type="radio"/> Year <input type="radio"/> Rank	

ACTIVITY 2

Teacher note: *This could also be used as assessment.*

STEP 4 > Class discussion

The teacher facilitates a class discussion of the survey results. The class discusses the relationship between the survey results and the historical weather records for their community.

- 1 > What were the results of the survey? Were responses similar or different among the residents surveyed? Did responses vary based on the amount of time subjects spent outdoors in their work or hobbies?
- 2 > How did the responses of long-time residents compare with the students' observation? If they differed, why might that be the case? (examples: age, work, hobbies).
- 3 > What did the historical weather records tell you about climate change during the period of time your subjects lived in the community? Have temperatures been warming, cooling, or about the same? Has precipitation increased, decreased, or stayed the same?
- 4 > Did the observations made by your subjects agree or disagree with the actual records of temperatures and precipitation? Do you think the actual changes have been large enough for people to notice?

ASSESSMENT IDEAS

- 1 > Retrieve a 30-year record of average annual temperatures and precipitation for Arctic cities such as Barrow, Alaska, and Old Crow, Yukon, which are also available from the National Climatic Data Center at www.ncdc.noaa.gov/oa/climate/research/cag3/cag3.html
- 2 > Repeat exercise on **Activity Sheet D** for Arctic cities.
- 3 > Have students compare data for these Arctic cities with their own city.

RESOURCES

- 1 > **Oral history/interviewing techniques:**
 - http://www.climatehotmap.org/curriculum/climate_change_guide.pdf
 - <http://www.hww.ca/hww2.asp?id=135>
- 2 > **What's weather? What's climate?**
 - <http://www.epa.gov/globalwarming/kids/climateweather.html>
 - http://www.ucar.edu/learn/1_2_2_8t.htm
- 3 > **Historical weather records:**
 - www.ncdc.noaa.gov/oa/climate/research/cag3/cag3.html

ACTIVITY 2 > CHANGES CLOSE TO HOME > ACTIVITY SHEET B

SURVEY FORM

Student Name _____

Interview participant # _____

Use a separate form for each of the three people you interview. Do not use the participant's name. Just enter a number 1, 2, 3, etc.

Before you begin:

- 1> Introduce yourself.
- 2> Explain the purpose of the survey: to collect observations from people in your community about changes in local climate. You are interested in talking to them because they have lived here for many years.
- 3> Define the term "climate:" Climate is the average weather in a location over a long period of time: Climate tells us what the weather is usually like in a particular place.

Ask each subject the following questions.

- 1 > How many years have you lived in the area? _____
- 2 > Overall, would you say that the climate has changed during the time you have lived here? If so, how has it changed?

- 3 > Do you (or did you) spend a lot of time outdoors in you work or your hobbies? Explain.

Ask each subject to respond to the following statements. (Circle one answer for each question)

- 1 > Compared to the past, today's summer temperatures are:
much hotter / somewhat hotter / same/ somewhat cooler / much cooler / not sure
- 2 > Compared to the past, today's winter temperatures are:
much colder / somewhat colder / same / somewhat warmer / much warmer / not sure
- 3 > Compared to the past, the number of unusually hot days now is:
much more / somewhat more / same/ somewhat fewer / fewer / not sure
- 4 > Compared to the past, the number of unusually cold days now is:
much more / somewhat more / same / somewhat fewer / fewer / not sure
- 5 > Compared to the past, our climate today is:
much wetter / somewhat wetter / same / somewhat drier / much drier / not sure
- 6 > We have more heavy downpours now than in the past: strongly agree / agree/ disagree / strongly disagree / not sure
- 7 > We have more droughts now than in the past: strongly agree / agree / disagree / strongly disagree / not sure
- 8 > We have more snow now compared to the past: strongly agree / agree / disagree / strongly disagree / not sure
- 9 > How much would you say your life today is affected by climate: significantly / somewhat / not at all
- 10 > How much was your life in the past affected by climate: significantly / somewhat / not at all

ACTIVITY 2 > CHANGES CLOSE TO HOME > ACTIVITY SHEET C

SURVEY SUMMARY

Student Name _____

STEP 1 > Tally the responses from each person you surveyed for each of the 10 questions you asked. For each question, write in how many of your subjects—0, 1, 2, or 3—selected each of the possible choices. For example, if three of your subjects chose “much hotter,” place a “3” in the blank next to “much hotter.” You will share this data during a class discussion.

1 > Compared to the past, today’s summer temperatures are:

___much hotter ___somewhat hotter ___same ___somewhat cooler ___much cooler ___not sure

2 > Compared to the past, today’s winter temperatures are:

___much colder ___somewhat colder ___same ___somewhat warmer ___much warmer ___not sure

3 > Compared to the past, the number of unusually hot days now is:

___much more ___somewhat more ___same ___somewhat fewer ___fewer ___not sure

4 > Compared to the past, the number of unusually cold days now is:

___much more ___somewhat more ___same ___somewhat fewer ___fewer ___not sure

5 > Compared to the past, our climate today is:

___much wetter ___somewhat wetter ___same ___somewhat drier ___much drier ___not sure

6 > We have more heavy downpours now than in the past:

___strongly agree ___agree ___disagree ___strongly disagree ___not sure

7 > We have more droughts now than in the past:

strongly agree ___agree ___disagree ___strongly disagree ___not sure

8 > We have more snow now compared to the past:

___strongly agree ___agree ___disagree ___strongly disagree ___not sure

9 > How much would you say your life today is affected by climate:

___significantly ___somewhat ___not at all

10 > How much was your life in the past affected by climate:

___significantly ___somewhat ___not at all

ACTIVITY 2 > **CHANGES CLOSE TO HOME** > **ACTIVITY SHEET C** SURVEY SUMMARY

STEP 2 >

Subject #1

1 > Subject has lived in my community for _____ years, since _____.
(Subtract the number of years lived here from the current year.)

2 > Overall, this subject observed that the climate has changed (*circle one*)
Significantly
Somewhat
None
They were not sure

Subject #2

1 > Subject has lived in my community for _____ years, since _____.
(Subtract the number of years lived here from the current year.)

2 > Overall, this subject observed that the climate has changed (*circle one*)
Significantly
Somewhat
None
They were not sure

Subject #3

1 > Subject has lived in my community for _____ years, since _____.
(Subtract the number of years lived here from the current year.)

2 > Overall, this subject observed that the climate has changed (*circle one*)
Significantly
Somewhat
None
They were not sure

STEP 3 >

1 > Calculate an average number of years lived here for your three subjects and enter it here. _____

2 > Subtract the average you calculated in #1 from the current year and enter it here _____. (You will enter this year as the "beginning year" and the "base period year" on the NOAA Web site to access historical weather records.)

ACTIVITY 2 > **CHANGES CLOSE TO HOME** > **ACTIVITY SHEET D**

Student Name _____

DATA FROM "CLIMATE AT A GLANCE" TABLE

STEP 1 >

Calculate an average **temperature** for the **most recent** ten years from your "Climate at a Glance" Table. Enter it here _____.

Calculate an average **temperature** for the **first 10** years from your "Climate at a Glance" Table. Enter it here _____.

Compare the two averages. How much of an increase or a decrease has there been? _____

STEP 2 >

Calculate an average **precipitation** for the **most recent 10** years from your "Climate at a Glance" Table. Enter it here _____.

Calculate an average **precipitation** for the **first 10** years from your "Climate at a Glance" Table. Enter it here _____.

Compare the two averages. How much of an increase or a decrease has there been? _____

ACTIVITY 2 > TEACHER REFERENCES

Teacher Reference #1: Sample Calculations for Climate at a Glance Table

Climate at a Glance Table

Year	Temperature Degrees F
2005	59.1
2004	59.8
2003	59.7
2002	60.8
2001	59.3
2000	58.8
1999	60.1
1998	61.0
1997	58.5
1996	57.8
1995	60.1
1994	61.1
1993	59.5
1992	58.9
1991	61.5
1990	61.9
1989	59.2
1988	58.3
1987	59.0
1986	59.8
1985	59.8
1984	59.1
1983	58.7
1982	58.4
1981	57.7
1980	58.5
1979	58.0
1978	57.8
1977	59.7
1976	58.8

Average for most recent 10 years (1996-2005):

$$594.9 \text{ divided by } 10 = 59.4$$

Average for first 10 years (1976-1985):

$$587.0 \text{ divided by } 10 = 58.7$$

Difference:

$$59.4 \text{ minus } 58.7 = .8^{\circ} \text{ F } (-13.33^{\circ} \text{ C})$$
