



4.6 EARTH'S CLIMATES

OBJECTIVES

The students

- Begin their study of climate.
- Differentiate between weather and climate.
- Begin to describe their local climate.
- Recognize that other parts of the planet have different climates.
- Use a globe to locate their island home in the Pacific Ocean, the equator, and the poles.
- Identify major climate zones.
- Observe that Earth is mostly covered by water, one big ocean.

CLIMATE EDUCATION FRAMEWORK

- 3-5Climate.A.1 Climate is the description of the pattern of weather in an area over many years. Different locations on our planet have very different climates.
- 3-5Climate.A.2 Pacific islands that are near the equator have warm climates. The temperature does not change very much from day to night. Temperatures do not change very much from month to month over the course of a year.
- 3-5Systems.B.2 Scientists describe and explain planet Earth as a system that has many connected parts. This way of understanding planet Earth is called Earth System Science.
- 3-5Systems.B.3 Earth system scientists investigate the solid, liquid, and gas parts of the Earth system. Solid matter includes rock, soil and sand. The main liquid matter is water. The main gases that make up the atmosphere are nitrogen and oxygen.
- 3-5Systems.B.4 Maps can show the locations, shapes and kinds of land and water in an area. Different kinds of maps, including a globe, can show the shapes of land and water on our planet.
- 3-5Systems.B.5 The ocean covers most of Earth's surface and has most of the planet's water.
- 3-5Systems.B.6 The ocean is a single, huge, interconnected body of salty water, which circulates through all the ocean basins and continents. Different parts of the world ocean have different names, but all these different parts are connected. The Pacific Ocean is the largest part of the world ocean.

BACKGROUND

This activity introduces students to the study of climate. The difference between weather and climate is discussed and students write a first working definition for climate. This difference between weather and climate is described in terms of time, weather is what is occurring in the present while climate describes what the weather is usually like over long periods of time.

Globes are used to locate their home island in the Pacific Ocean, the Equator, the poles and other planet features. Climate of their Pacific Island home is contrasted to the climate of the poles. Logic and some prior geography knowledge will be used to help describe the intermediate or temperate zones. Other kinds of maps can be used in addition to the globe but globes are preferred as they provide a more accurate model of Earth. Next the students use the globe to explore the world ocean, noting that it is all connected. Major land masses are identified and the ratio of land to water is observed.

STUDENT ROLE

Meteorologist
Geographer

MATERIALS

Globes (1 per group if possible)
World and other maps (optional)
chart paper
markers
Working Dictionary

PRODUCTS

Description of the local climate
Working definition of climate
Optional: SP 4.6 CLIMATE ZONES

PROCEDURES

1. **Help the students begin to distinguish between weather and climate.**
Ask such questions as
 - What is your working definition for weather.
✓Review from their Working Dictionary.
 - Does anyone know what climate is?
✓Accept all responses initially.
 - How are weather and climate different?
✓Climate describes the usual or prevailing (long-term, average) weather for an area. Weather describes the current or short-term conditions.
✓This is an opportunity for students to do some research.
 - How are weather and climate the same?
✓The same elements are usually reported including such things as temperature, wind speed and direction, precipitation, and so forth.
 - How could the weather or climate affect the amount of water a place has?
✓Accept all ideas at this point.

2. Introduce the students to the globe as a map of planet Earth.

Ask such questions as

- What is this called?
- What does it represent?
✓Planet Earth.
- How is a globe like a map? How is it different?
✓It may be helpful to have a world map available for this comparison.
- What liquid does planet Earth have on its surface?
✓Water.
- What solids does Earth have on its surface?
✓Accept all reasonable answers but work to include rocks, soil and sand.
- What are the main gases found in Earth’s atmosphere?
✓The major gases are oxygen and nitrogen. Have the students research this if they do not know.

3. Have the students work in small groups to explore the globe.

Have them locate

- The Pacific ocean.
- Their home island.
- The equator.
- The North and South Poles.
- Other features such as continents, other pacific islands, the Tropics of Cancer and Capricorn, etc.
✓This can be a team game with the teacher challenging the teams to find things the quickest.

Optional: Contrast the locations of things on the globe with their locations on a world map. Help the students to note how shapes and sizes vary.

- ✓This is an excellent opportunity to integrate social studies.

4. Have the students hypothesize about climates on different parts of the globe (Earth).

Have them

- Describe what they think the climate is for their island.
✓Pacific islands that are near the equator have warm climates. Temperatures do not change very much from month to month over the course of a year.
- Ask if the North Pole and places like Alaska have this same kind of climate. Ask how they think it is different. Ask how they could find out.
✓This is an opportunity for research in books or on the Internet to verify or provide evidence for their ideas.
- Ask about places in between (the temperate zones).
✓For these beginning students, it is sufficient if they recognize that it is colder at the poles, warm to hot near the equator, and probably something in between in the middle areas.

5. Have the students write a first working definition for climate. Record it in the Working Dictionary. Help them include a description of their local climate.

6. Have the students work in small groups to explore the world ocean using globes.

Ask such questions as

- What ocean is our island located in?
- Are there any other oceans? What are they?
✓Have the students locate some of the other oceans.
- Are the Atlantic and Pacific Oceans connected? Where?
- Is the Pacific Ocean connected to any other ocean?
✓Continue asking about oceans connecting to oceans until the students recognize that they are all interconnected into one big ocean.
- So what can you say about all these oceans.
✓Work toward something like they are all really just one huge world ocean. Different parts have different names.
- What is the biggest part of the world ocean called?
✓The Pacific Ocean.
- Which covers more area of the Earth, land or water?
✓Water should be the obvious choice.
- Can you drink ocean water? Why not?
- Where do we get fresh drinking water from?
✓Accept all answers. This helps to connect to other activities.

EXTENSIONS

- Have the students research the terms polar climate zone, tropical climate zone and temperate climate zone and locate them on a globe or world map. Use SP 4.6 CLIMATE ZONES or have them draw in the zones and other features on a big circle—trace around a plate.
- Have each student pick a favorite country, research its climate and locate it on a globe or map.
- Have the students investigate specific climates and find where they are located on the globe.



**CLIMATE
ZONES
SP 4.6**

Name: _____

Date: _____

Label the following:

- Equator
- North Pole
- South Pole
- Tropic of Cancer
- Tropic of Capricorn
- Arctic Circle
- Antarctic Circle

Color the following:

- North Polar Climate Zone (blue)
- South Polar Climate Zone (blue)
- North Temperate Climate Zone (green)
- South Temperate Climate Zone (green)
- Tropical Climate Zone (red)

