# *Paths of Settlement*

Replacement Assignments for *Weather* (Golden Guide) Activities

## Instructions

*DK Weather Facts* that was originally used in *Paths of Settlement* has gone out of print. An alternate book has been selected to use for your study of weather. It is *Weather* (Golden Guide). Please use the text that follows as a substitute for the text in your book. You may want to mark each section in your book with a pencil to make it easier to identify when to refer to this alternate text.

Note: When counting paragraphs, we count from the first complete paragraph on the page indicated.

## Unit 1

### Lesson 1, Part 2E

**page 8, last paragraph through page 9 paragraph 4:**

Since the Pilgrims' first problem in New England involved weather, that is a good place to begin your study of Earth Science. To get started, ask your teacher's permission to lightly number (with a pencil!) the chapters listed on the "Contents" page in your *Weather* (Golden Guide) book. In other words, put a "1" in front of "What Makes the Weather," a "2" in front of "Rain, Snow, Dew, and Frost," and so on. That will make it easier to find assigned pages as you go through these lessons!

Together with your teacher, read the following pages in your Weather book (for now, don't worry about any pages that aren't mentioned!):

Chapter 1: "Everybody Talks About the Weather" and "What Makes the Weather?"

Chapter 11: "Weather and Climate."

Then listen as your teacher reads the introductory paragraphs about climate and weather on pages 780 and 781 in the *Handbook of Nature Study*.

Talk with your teacher about the differences between weather and climate, and then write a definition for both words in your Student Notebook.[4] Now find the word meteorologist in your dictionary, and write down its definition.[5] When you are finished, look up barometer, hygrometer, and anemometer and write down the part of weather each one measures.[6] Perhaps you know, or can guess, what rain gauges and thermometers measure, so write them in your Student Notebook along with the other tools. If you don't know, look up these items also.

*The Handbook of Nature Study* mentions that weather affects many things in your life. How many things can you think of that weather affects? Discuss this with your teacher and then list as many things as you can.[7]

This year you will become a *weather watcher*, which simply involves paying attention to things that are happening in the air around you. When you think about the many things in your life that are affected by weather, becoming a weather watcher seems like a very good idea. Through the next few lessons you will make a weather station and record the things that you observe.

To help you begin observing the weather, hang an outdoor **thermometer** someplace where it is not in direct sunlight. This will allow your thermometer to get a more accurate measurement of the temperature of the air. When you are finished, follow the directions below to make a rain gauge. **Rain gauges** are simple tools used to measure the amount of rainfall in an area.

## Lesson1, Part 4E

**page 17, paragraph 2:**

Nowadays, scientists have found that several things work together to cause changes in the weather. These things all happen in the earth's atmosphere, which is the mixture of gases that surrounds the earth. There are three things in our atmosphere that interact, or affect each other, to cause different types of weather: heat energy, air pressure, and moisture. But in order to understand how those things affect each other, you first need to know a few basic things about the atmosphere. Together with your teacher, find and read the following pages in Chapter 3 of your *Weather* (Golden Guide) book (for now, don't worry about the pages that aren't mentioned!): "The Atmosphere," "The Atmosphere consists …," "The Troposphere—Weather Breeder," "The Stratosphere," "The Mesosphere," "The Thermosphere," and "The Exosphere."

**Level 6 assignment, page 19:**

Write down two additional facts about each layer of the atmosphere12. Then, in Chapter 10 of your *Weather* (Golden Guide) book, read the pages about "Making Your Own Forecasts from Observations," and "Weather Signs." When you are finished, use the library or, with your parent's permission, the Internet to find two or three sayings about the weather that people made up long ago, based on their observations of the air around them. Find out what each one means, and whether or not it actually helps predict the weather. When you are finished, write the sayings in your Student Notebook, and share what you have learned with your family.

## Lesson 2, Part 2E

**page 30, paragraph 2:**

Another name for heat energy is radiant energy, because it radiates from the sun in invisible waves. These radiation waves travel in straight lines through space. When they bump into tiny molecules in the atmosphere, however, many of them can be seen as light. Others remain invisible. Together with your teacher, read and discuss the pages in Chapter 1 of your *Weather* (Golden Guide) book entitled "The Sun," "What Happens to the Sun's Heat," and "The Atmosphere as a Thermostat."

**Level 6 assignment, page 32:**

Read the page entitled "Earth As a Greenhouse" in Chapter 1 of your *Weather* (Golden Guide) book. Then at the library or, with your parent's permission, on the Internet find out more about the greenhouse effect. When you are finished, write at least three facts about this process in your Student Notebook. Share what you learn with your family.

## Lesson 2, Part 4E

**page 39, paragraphs 1-2:**

When air is less dense, its push against the earth is also less. High air pressure generally means the weather is good, because there are fewer things interacting in the air. But when the pressure begins to fall it's a good guess that bad weather is on the way. Together with your teacher, read and discuss the pages in Chapter 5 of your *Weather* (Golden Guide) book that are entitled "Highs and Lows," "How Highs are Born," and "How To Locate Highs and Lows."

Then follow the directions in Appendix A to make a **barometer**, which is the weather tool that measures air pressure. Making a barometer will give you three tools (a thermometer, a rain gauge, and a barometer) to use when you watch the weather. Be sure to record your weather observations for each of the next few days on the Weather Watcher pages in your Student Notebook.

## Lesson 3, Part 2E

**page 47 last paragraph:**

Together with your teacher, read and discuss the page in Chapter 1 of your *Weather* (Golden Guide) book that is entitled "Heat and Air Movements." When you are finished, follow the directions in Appendix A to make an **anemometer**. An anemometer is a weather tool that measures the speed of the wind.

## Lesson 3, Part 4E

**page 54, paragraph 1:**

(Paragraph 1) If you have ever stood on the shore of an ocean or a lake, perhaps you noticed a strong breeze, or light wind. It is usually windier near a large body of water, because land heats up and cools down faster than water. The differences in temperature over the two areas cause the wind to blow. Together with your teacher, read and discuss the page in Chapter 1 of your *Weather* (Golden Guide) book that is entitled "Convection."

**page 55, paragraph 3:**

Use the compass rose shown on this page as a model to label the one in your Student Notebook. You may want to add color with crayons, markers, or colored pencils. Then, with your teacher read the pages in Chapter 9 of your *Weather* (Golden Guide) book entitled "Wind Speed and Direction," and "Beaufort Wind Scale." When you are finished, follow the directions in Appendix A to make a **weather vane**. A weather vane tells what direction the wind is blowing.

**Levels 5, 6 assignment, page 56:**

Together with your teacher, read and discuss the pages in Chapter 4 of your *Weather* (Golden Guide) book that are entitled "Earth's Rotation and Winds," "General Air Movements," and "Earth's General Circulation." On a separate piece of paper, write a paragraph (three or four sentences) describing what you have learned, and add it to your Student Notebook.

**Enrichment, page 58:**

2. Read the pages in Chapter 4 of your *Weather* (Golden Guide) book entitled "Wind Deflection." This section describes the Coriolis Effect. Of course, you most likely don't have a phonograph record or a turntable, but you can do this experiment with a plastic lid and a pushpin stuck through the middle to something solid. Ask someone

else to turn the lid slowly while you make the mark! When you are finished, talk with family members about what the Coriolis Effect is, what causes it, and what affect it has on Earth.

# Unit 2

## Lesson 2, Part 2E

**page 136, paragraph 3 through page 137, first paragraph:**

With your teacher, read the page in Chapter 1 of your *Weather* (Golden Guide) book entitled "Heat and Atmospheric Water." When the sun warms oceans and rivers, the water in them heats up and begins to rise into the air as water vapor, or steam. Salt and other minerals in the ocean do not become part of the vapor. This process is called evaporation, and is the first step in the water cycle.

Air high above the earth is colder than the air close to land, and causes water, vapor to cool as it rises. When it is cool enough, it changes into tiny droplets of water that gradually group together and form clouds. This is the second step of the water cycle, and is called condensation. You can see an example of condensation if you place a glass of very cold water in a warm place. Tiny droplets will form on the outside of the glass. These droplets do not come from the water inside the glass – they come from the air! When the warm air comes into contact with the cold glass, water vapor in the air changes into droplets. With your teacher, read the page in Chapter 1 of your *Weather* (Golden Guide) book entitled "How Clouds Are Formed."

Before long, the clouds become heavy and gray because they are full of water. When they can't hold any more, the water droplets fall back to earth as rain, snow, sleet or hail. This is called **precipitation**, and is the third step in the water cycle. Then when the water falls, it is either absorbed into the ground to water plants and fill up deep wells, or it ends up in lakes, rivers or oceans. This process is called **collection**. Once the water is back on earth, the cycle begins again.

With your teacher, read the pages in Chapter 2 of your *Weather* (Golden Guide) book entitled "Precipitation," "What Makes It Rain," and "What Happens To Rain and Snow." When you are finished, color and label the Water Cycle Chart in your Student Notebook. Use the chart to explain each step in the water cycle to your teacher.

**Level 6 assignment, page 137:**

Together with your teacher, read the pages in Chapter 2 of your *Weather* (Golden Guide) book entitled "Dew" and "Frost." Then, write three or four sentences on a piece of notebook paper that explain what you learned, and add it to your Student Notebook.

## Lesson 2, Part 4E

**page 144 paragraphs 1-3:**

Different types of clouds that appear in the sky are an important part of predicting weather. Together with your teacher, read and discuss the pages in Chapter 1 of your *Weather* (Golden Guide) book entitled "Cloud Classification," "Cloud Names," "High Clouds," "Middle Clouds," and "Low Clouds."

Choose four types of clouds mentioned in the sections you just read, and research them at the library or on the Internet. Then, in your Student Notebook, draw and color a picture of each type you chose and list at least three facts about it.[18]

Although you haven't watched the weather for a few lessons, start your weather station again today, and add more information about the clouds to your observations. Use your *Weather* (Golden Guide) book to identify the types of clouds you see, and record your weather observations on the Weather Watcher pages in the back of your Student Notebook.

## Lesson 3, Part 2E

**page 156, paragraph 4:**

Put your earth-model in the refrigerator, because you will use it again in Part 4 of this lesson.

## Lesson 3, Part 4E

**page 163, paragraph 3:**

Together with your teacher, read and discuss the pages in Chapter 4 of your *Weather* (Golden Guide) book entitled "The Earth's Motions and Weather" and "Cause of the Seasons," and "Summer Is Warmer" with your teacher.

**page 164, paragraph 5:**

Use the picture at the beginning of Chapter 4 in your *Weather* (Golden Guide) book to complete the chart in your Student Notebook.

## Lesson 4, Part 2E

**page 174, paragraph 2 last sentence:**

With your teacher, read and discuss the pages in Chapter 2 of your *Weather* (Golden Guide) book entitled "Ice Prisms," "Ice Pellets," "Hail," and "Ice Storms."

**paragraph 3, last sentence:**

Together with your teacher, read and discuss the pages in Chapter 2 of your *Weather* (Golden Guide) book entitled "Snow" and "Snow Pellets."

**page 175, paragraph 1:**

Disregard last sentence.

## Lesson 4, Part 4E

**page 181 last paragraph:**

Together with your teacher, read and discuss the pages in Chapter 8 of your *Weather* (Golden Guide) book entitled "Hurricanes," The Eye of a Hurricane," and "The Life History of a Hurricane." After reading those pages, with your parent's permission continue your research on the Internet at: http://skydiary.com/kids/ hurricanes.html.

**Enrichment, page 185:**

3. Read and discuss the page in Chapter 8 of your *Weather* (Golden Guide) book entitled "Destructiveness of Hurricanes." Then, research Hurricane Andrew, a large hurricane that hit the United States in 1992. Prepare a short report to include in your Unit End Presentation. Include information about the storm and pictures, if possible. Explain the category system by which hurricanes are classified. Tell about how much preparation time people had as the storm approached, the course that it followed, and its impact on all areas that it struck.

# Unit 3

No changes

# Unit 4

## Lesson 1, Part 2E

**page 8, paragraph 3:**

Begin your study by reading the pages in Chapter 9 of your *Weather* (Golden Guide) book entitled "Weather Forecasting," "Collecting the Data," "Radar Equipment," and "Weather Satellites," and "Weather Maps."

## Lesson 1, Part 4E

**page 17, paragraph 3:**

When you are finished, read and discuss Chapter 6 of your *Weather* (Golden Guide) book, about Air Masses. Then use the diagram on the JetStream School page as a model to label source regions in your Student Notebook. Be sure to draw in the arrows that show what directions the air masses formed in each region travel. Then use the pages that tell about North American Air Masses in Chapter 6 of your *Weather* (Golden Guide) book to write a few words about each source region (like "hot and dry" or "very cold and a little moist").

## Lesson 2, Part 2E

**page 28, paragraph 2:**

Together with your teacher, read and discuss the first five paragraphs of the section entitled "The Winds of the World" on pages 791 and 792 in *The Handbook of Nature Study*. Then read or reread the pages in Chapter 4 of your *Weather* (Golden Guide) entitled "The Earth's General Circulation." When you are finished, go online to the JetStream School site and click on the chapter entitled "Global Circulations." From there, go to the section that explains global circulations.

**page 29, paragraph 3:**

With your teacher, read and discuss the pages in Chapter 3 of your *Weather* (Golden Guide) entitled "Tropopause and Jet Stream." Then use the diagram below as a model to draw and label jet streams on the globe in your Student Notebook. Then list three facts about these rivers of air in the spaces provided.

## Lesson 3, Part 2E

**page 48, last paragraph:**

Once again, go to the JetStream School on the NOAA website, and click on "Synoptic Meteorology." Then go to the section about "Air Masses." With your teacher, read and discuss the bottom part of that page, which explains fronts. Then read and discuss the pages in Chapter 7 of your *Weather* (Golden Guide) book entitled "Fronts," "Front Facts," "Cold Fronts," and "Warm Fronts."

## Lesson 3, Part 4E

**page 57, paragraphs 2-3:**

Together with your teacher, read and discuss the pages in Chapter 7 of your *Weather* (Golden Guide) book entitled "Squall Lines." Then turn to Chapter 8 and read the pages entitled "Storms," "Thunderstorms," "Judge the Distance," and "Thunderstorm Development." When you are finished, go to the JetStream School on the NOAA website, and click on the chapter entitled "Thunderstorms." From there, click on "Life Cycle." Read and discuss the information on that page with your teacher. Both the *Weather* (Golden Guide) book pages and the JetStream School explain how a thunderstorm develops, but the charts on the JetStream site may be a little easier to understand. The yellow arrows in these charts show the direction of the wind flow, called updrafts and downdrafts, at each stage. Look back at the Cold Front model in Part 2 of this lesson, and you can see another view of warm air being pushed upward, like that pictured in the first chart on this page.

## Lesson 4, Part 2E

**page 69, paragraph 4:**

Together with your teacher, read and discuss the pages entitled "Lightning" and "Lightning Safety" in Chapter 8 of your *Weather* (Golden Guide) book. Then go to the JetStream School site and click on the chapter about Lightning. Read and discuss the sections entitled "How Lightning is Created" and "The Sound of Thunder" with your teacher. Complete the Learning Lesson entitled "The Rumblin'Road" on the page about thunder, and write one or two sentences in your Student Notebook that describe the experiment.

## Lesson 4, Part 4E

**page 77, last paragraph:**

Together with your teacher, read and discuss the pages entitled "Tornadoes" and "A Tornado" in Chapter 8 of your *Weather* (Golden Guide) book. Then go to the JetStream School site and click on the chapter there that is entitled "Thunderstorms." Read and discuss the page about tornadoes with your teacher. Notice the map that shows almost all tornadoes happen east of the Rocky Mountains, and mostly in the Midwestern states, Texas, and Florida.

# Unit 5

## Lesson 1, Part 2E

**page 127, paragraph 1:**

Together with your teacher, read and discuss the introduction to "Climate and Weather" on page 780 in *The Handbook of Nature Study*. Then read and re-read the pages entitled "Weather and Climate" and "Climatic Data" in Chapter 11 of your *Weather* (Golden Guide) book.

## Lesson 1, Part 4E

**page 136, first paragraph:**

A climograph is a diagram sometimes used by meteorologists to combine **data**, or factual information, about two different things on one chart—average temperatures and average rainfall for an area. Temperatures are shown as a bar graph, by coloring in boxes. Rainfall is shown as a line graph, with lines showing increases and decreases. In this section you will make a climograph for your area of the country.