



Living During the Little Ice Age

Unit: Little Ice Age
Lesson: 3

Materials & Preparation

Time:

- Preparation: 10 minutes
- Teaching: 30 minutes

Materials for the Teacher:

- White/black board and markers/chalk
- Overhead transparency of graphs (p.3)

Materials for Student Pairs:

- Student pages 1 - 3
- Pencil and paper

National Science Standards

- Science as Inquiry: Content Standard A
- Earth and Space Science: Content Standard D
- Science in Personal and Social Perspectives: Content Standard F

Colorado Science Standards

- Science: 1, 3.2, 4.1, 4.2, 6

Learning Goals

Students will:

- Understand the nature of the Little Ice Age (1350-1850 A.D.)
- Understand how historical records of crops, economics, and famine, as well as art, document climatic changes during the Little Ice Age.
- Interpret and compare data using graphs.

What Students Do in this Lesson

Students brainstorm what the living conditions during the period known as the Little Ice Age (1350-1850) might have been like. Then students study information about lifestyles, the economy, crop yields, and human and livestock mortality during the Little Ice Age. They compare, and discuss what they have learned.

Key Concepts

- The Little Ice Age was a period of unusually cool conditions between the years of 1300 and 1850 A.D.
- Humans experienced increased illness and famine during the Little Ice Age.
- Livestock survival and crop productivity decreased.
- Cost of food increased due to shortages and low crop yields.
- The Little Ice Age was preceded and followed by periods of warmer climates.



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Advanced Preparation

- Copy student page 1 (one per student) (Or make one overhead of this page.)
- Copy student pages 2 and 3 (enough for groups of 3 – 4 to each get one of the 2 pages)
- Make an overhead of page 3 of this lesson.

Facilitating the Lesson

- Explain to students that in this lesson they will study how people living in Northern Europe were effected by climate change a few hundred years ago. Show them this area of Europe on a map.
- Tell students that between 1300 and 1850 many parts of the world experienced repeated unusually cool conditions that scientists have called the “Little Ice Age.” During these cooler times, winters were longer and colder than normal, and summers were shorter and cooler.
- Ask students what they think the living conditions would have been like during this time, and list student ideas on the board. They should understand that people living during the Little Ice Age, would have been affected by:
 - Decreases in plant growth
 - Crop failures and reduced productivity of plants and animals they used for food
 - Increased death of humans and livestock due to famine and illness
- Have students answer questions on Student Page 1. *Does this painting describe weather? Does this painting describe climate? Was it always colder then? What information might make this evidence more clear?*
- Provide student pairs with either student page 2 or 3 and ask the students to answer the questions as they study the information on their student page.
- Bring the students together to share the documented effects of the Little Ice Age. Discuss their conclusions while looking at the overhead of all graphs shown together and have each student answer the following: *How does the cost of grain change? In which years was there high livestock mortality?*

Science Background Information

The Little Ice Age (1350-1850) was a period of particularly harsh climate conditions across most parts of the world. Most of the documents that record information about the Little Ice Age come from Northern Europe because extensive records were kept. A combination of decreased solar activity and numerous large volcanic eruptions cooled Earth's climate. Cooling caused glaciers to advance and stunted tree growth. Livestock died, harvests failed, and humans suffered from increased famine and disease. The Little Ice Age illustrates changes to climate that occur when the Sun is less active and cooling of Earth is exacerbated by volcanic eruptions. Many other examples of climate change due to natural forces exist including the “year without a summer” which followed the 1815 eruption of Tambora, in Indonesia. At an earlier time, Europe experienced a warm period which may have helped the Vikings to settle Greenland. In order to understand the current climate change debate, one must understand the natural events and cycles that play an important role in determining climate on Earth.

Additional Resources

- Little Ice Age: UC San Diego http://calspace.ucsd.edu/virtualmuseum/climatechange2/04_3.shtml
- Suffolk Community College: <http://www2.sunysuffolk.edu/mandias/lia/index.html>



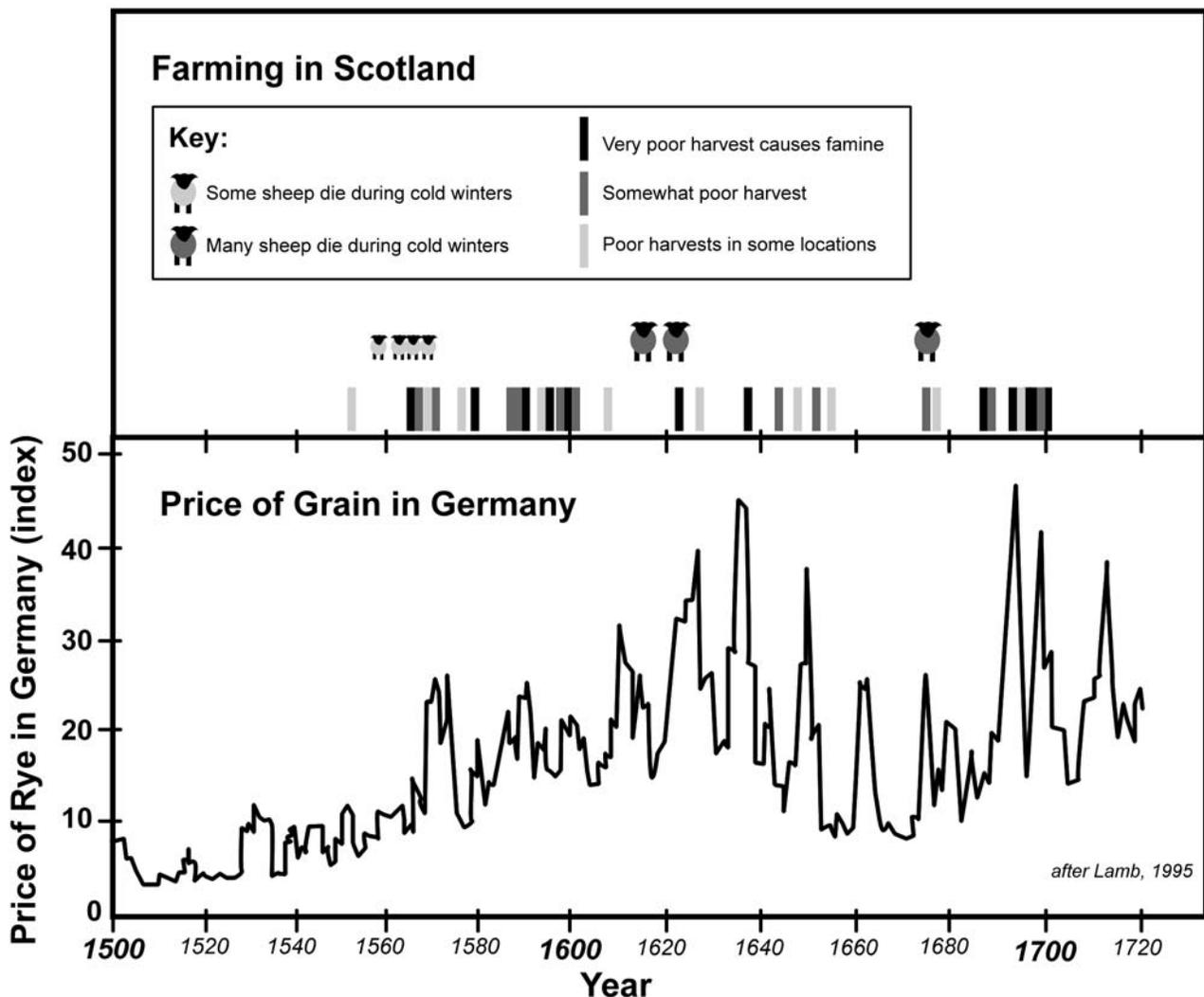
Living During the Little Ice Age

Wrap up questions:

How does the cost of grain in Germany change between 1500 and 1700?

In what times was there less food to eat in Scotland?

How is climate related to grain in Germany and farming in Scotland?



Instructor: Copy onto overhead transparency



Page #1: *Living During the
Little Ice Age*

Name _____
Date _____ Class _____

A Typical Winter Day During the Little Ice Age

This scene, captured by the artist Peter Bruegel the Elder during 1565, depicts people engaged in a wide range of activities.

- How do you think the painting shows the effects of weather or climate?
- Do you think that artwork is based on reality or fiction? Explain your answer.
- What additional information would you like to have in order to know if the artwork represents the real weather or climate conditions of the time?





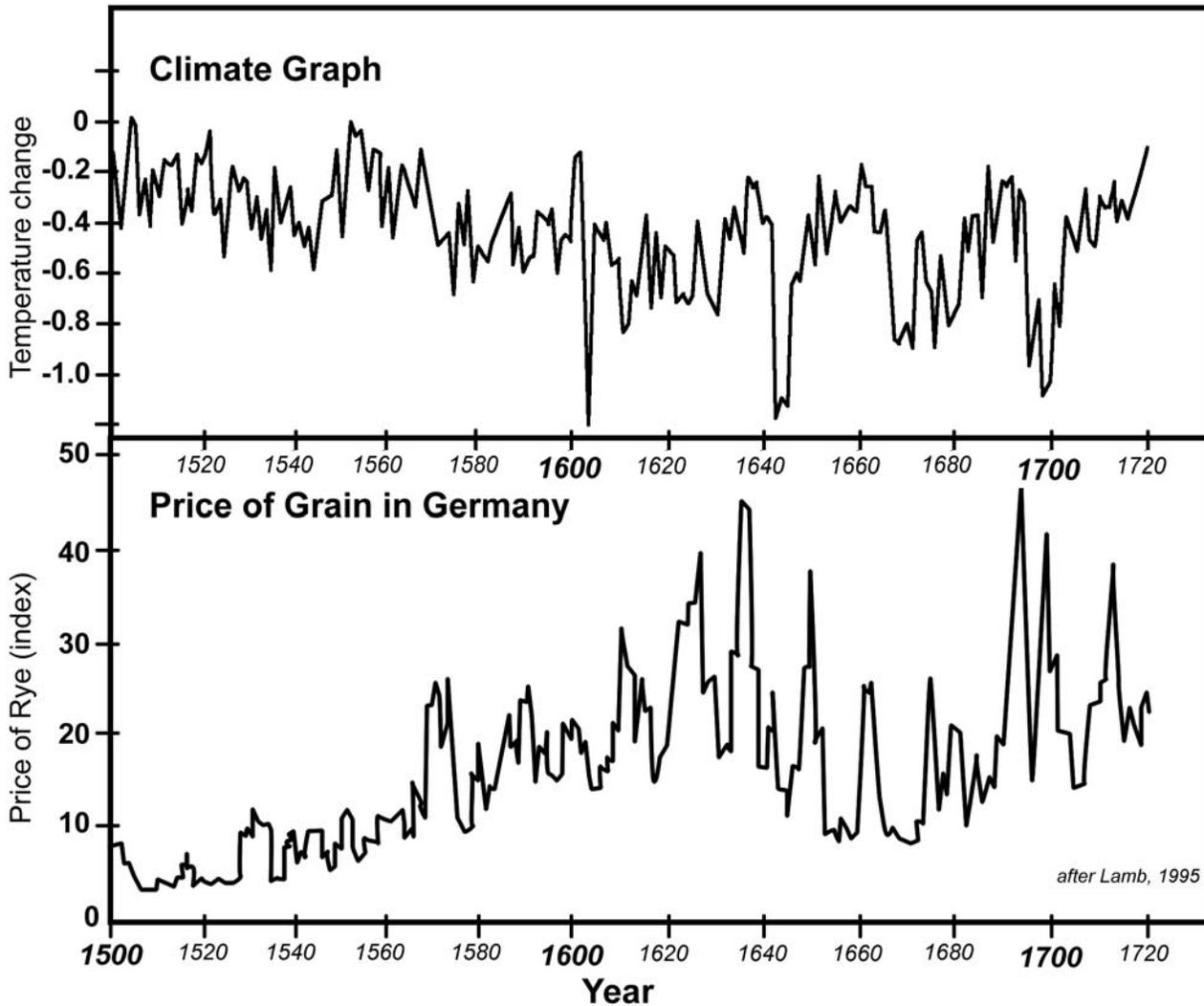
Page #2: Living During the Little Ice Age

Name _____
Date _____ Class _____

Cost of Grain in Germany during 1500 to 1700

Study the graph in order to answer the following questions:

- How does the cost of grain change in Germany between 1500 to 1700?
- Are there years when grain is inexpensive and other years when it is expensive?
- What do you think might cause changes in the price of the grain?



Climate (top) and cost of rye in Germany (bottom) from 1500-1720

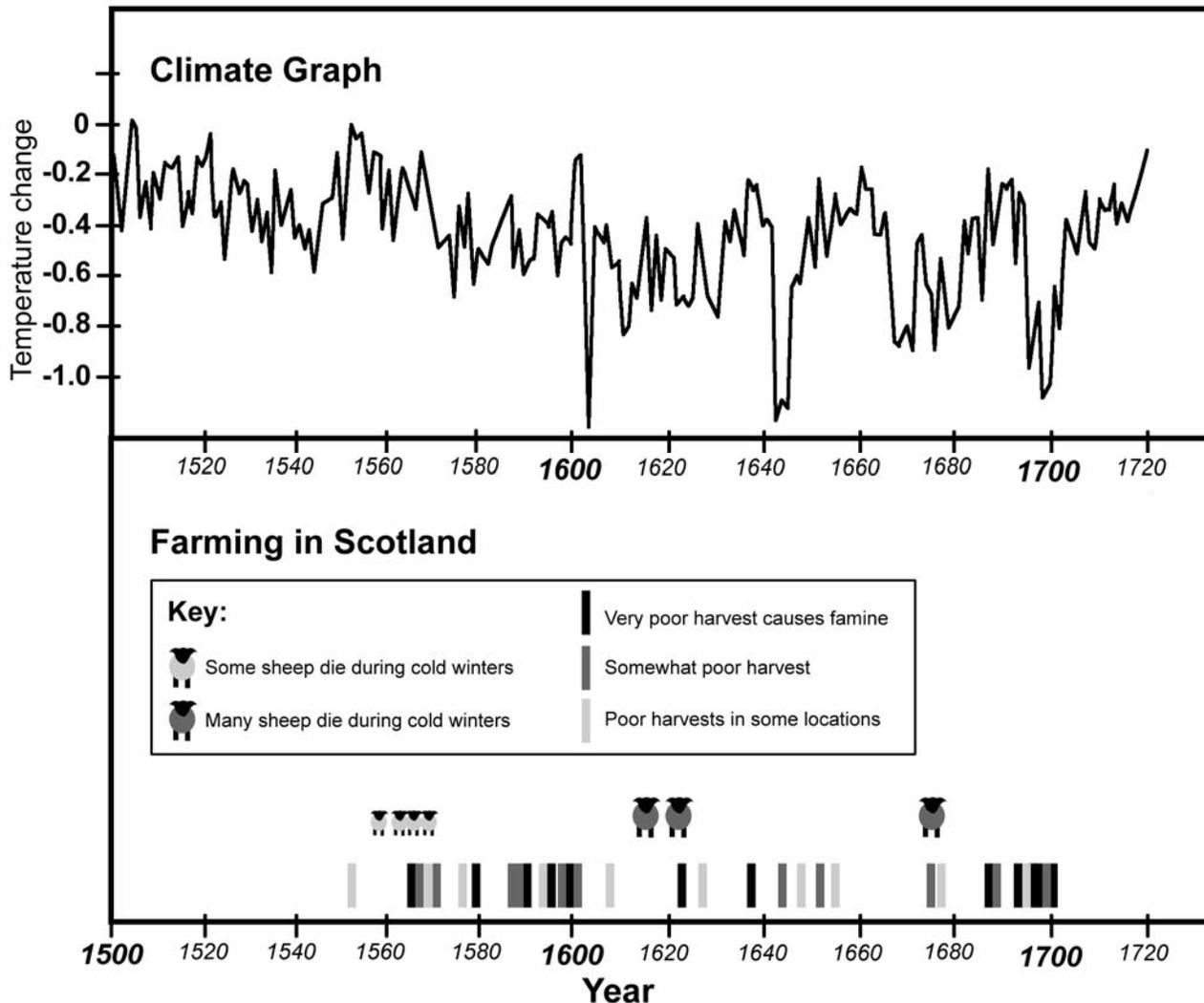


Name _____
Date _____ Class _____

Mortality of People and Livestock in Scotland (1500-1700)

Study the graph to find answers to the following questions

- In which years do you think life in Scotland was very difficult due to lack of food?
- What conditions can cause the death of sheep?
- What conditions do you think might cause a poor harvest?
- How do you think that the death of sheep and a poor harvest combine to affect the conditions for people living in Scotland?
- What happens to the death rate of humans when food is unavailable?
- Which occurs first: harsh winter conditions, death of sheep, poor harvest, or famine? Why do you think so?



Climate (top) and health of sheep and crops in Scotland (bottom) from 1500-1700 (after Lamb, 1995)