

Sprouting Success in Illinois from North to South

Grade Level: 4-8

Lesson Overview

Choosing plants that are best to grow in your area is an important first step in having a successful crop. A good place to start is to research plants that are best suited for your growing zone.

Student Objectives

1. Identify the types of information found on the back of a seed packet.
2. Determine the suitability of the plant to ensure survival based on the USDA Plant Hardiness Zone map.

Materials

- ✓ Sprouting Success In Illinois From North to South student worksheet
- ✓ Hardiness Zone Activity student worksheet
- ✓ Illinois Hardiness Zone Map
- ✓ internet access
- ✓ seed packets

Vocabulary

- **days to maturity** – the number of days from planting to harvesting.
- **frost free days** – number of days when the temperature stays continuously above 32 degrees Fahrenheit. This period of time is generally considered the growing season for your zone and its length determines the most suitable plants that grow based on their days to maturity. This is an average calculation over a several year span of time.
- **germination** – to cause to sprout or develop; to begin to grow.
- **hardiness zone** – areas in geographic regions that have similar average annual low temperatures.
- **soil texture** – the feel or composition of a soil based on the proportion of sand, silt and clay in the soil.
- **sow** – to plant seed for growth.

Background Information

The USDA Plant Hardiness Zone Map is a system for rating the cold-hardiness of plants. This map is issued by the United States Department of Agriculture (USDA) and was last updated in 2012. This update uses the 30 year period of 1976-2005 compared to the old USDA map which used the period of 1974-1986.

This ranking system divides the United States into 11 zones that are based on the average minimum temperatures in the winter. The zones are further divided into “a” for the lower temperature of a zone and “b” for the higher temperature. Each growing zone is 10 degrees warmer or colder in an average winter than the adjacent zone. One of the most notable features of the new map is the northward shift of the hardiness zones in Illinois. For example, the boundary between zones 5 and 6 has shifted approximately 60 miles to the north. Zone 4 has left Illinois in the new map.

Plants will often have a range of hardiness zones noted such as 4 to 6. This means that plants are predicted to be hardy and suitable for zones 4, 5 and 6. This is not a fail-safe method for determining how hardy a specific plant will be. Variables such as sun, shade, wind, humidity, elevation and rainfall can affect the hardiness of a plant and how well it performs. Other significant weather extremes like an extended period of warm temperatures in the late fall with a very quick, drastic drop in temperatures in early winter before the plants have hardened off can cause damage or even kill some plants that are known to be zone hardy.

Procedure

1. Share the following information with your students: Before planning a garden or landscaping your property, you must consider which plants will survive in your local climate. Some plants cannot handle winters, others wither in the heat, and others such as tulip bulbs, need a cold period to stimulate spring growth. The U.S. Department of Agriculture has divided the country into “hardiness” zones. These zones are based on the climate of a particular region. Plants that are not hardy for a specific zone will not survive the temperatures there. Plants that thrive in the year-round warmth of Florida would die during the Illinois winter, unless you brought them indoors each fall. Plants that are hardy for more northern states might wilt and die during a Florida summer. You will need to determine what types of plants are best suited to Illinois.
2. The next thing you have to consider before planting is the slight variations in the sunlight, moisture or wind currents on different parts of your property. This is called “microclimate” and it will also influence whether or not the plants will do well where you put them. Plants vary in their need for different amounts of sunlight or moisture. Some prefer full sunshine, some prefer shade, and others don’t seem to mind growing in either bright sun or shade. Some plants do better

in moist soil; others prefer the soil to be drier, with lots of drainage. In addition, delicate plants or those with long thin stems might not do well in a place exposed to strong wind. Illinois has 5 different hardiness zones. They range from Zone 5a (where low temperatures can reach -20 to -15 degrees Fahrenheit) to Zone 7a (where low temperatures can reach 0 to 5 degrees).

3. Introduce students to the Illinois Hardiness Zone Map. Point out that this map is a close-up view of the different zones in Illinois. Explain the numbering system (the higher the number, the warmer the climate) and ask them to find the county they live in. Have them brainstorm what kind of plants might grow in Zone 7a (the most southern section of Illinois) that might not survive in the northern section of Illinois. Ask them to explain what would cause this.
4. Direct students to complete the Student Worksheet - Hardiness Zone Activity.
5. After completion of the Student Worksheet - Hardiness Zone Activity, distribute a seed packet to small groups of students. Instruct them to look at the seed packet and answer the questions on Student Worksheet - Sprouting Success in Illinois from North to South. An alternative to using seed packets is to log onto <https://www.reneesgarden.com/collections/seed-packets-only> for sample seed packets.

Extension Activities

1. Students can complete the Scavenger Hunt lesson from the activity book "Farmers' Almanac – Almanac Themed Activities" downloaded from <http://agintheclassroom.org/TeacherResources/Lesson%20Booklets/Farmers'%20Almanac%20Lessons.pdf>
2. Challenge students to brainstorm what the range of high temperatures are in Illinois. Information on this can be found through Internet research. An additional activity would be to direct students to make their own thermometer, using water, rubbing alcohol, water bottles, food coloring, straw and modeling clay. Please refer to the activity "Make a Thermometer" - <http://www.energyquest.ca.gov/projects/thermometer.html>

3. Seed Packet Scramble

Activities a and b complement each other and can be used together.

- a. Provide each student with a different seed packet and have them form a line in the front of the room. Using various facts from the seed packet, direct the students to arrange themselves in the correct order. Possible aligning criteria: common name in alphabetical order; days to germination; days to harvest; other criteria as the teacher can determine.

- b. Provide each student with a different seed packet and have them form a line in the front of the room. Have students step forward from the line if their seed packet states: sow indoors; sow after danger of frost; sow in spring and/or fall; grows in hills; other criteria as the teacher can determine.
- c. Have students share any additional interesting facts or garden tips from their seed packet.
- d. Are these seeds suitable for planting in your Hardiness Zone?

Additional Resources

USDA Plant Hardiness Zone Maps: <https://planthardiness.ars.usda.gov/PHZMWeb/>

A wide selection of maps may be downloaded for the United States, regional areas, as well as individual states. This site now includes an interactive GIS map and has a ZIP code finder that provide the plant hardiness zone for all U.S. Zip codes.

Standards

Illinois Science Standard

MS.ESS.3.3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

ELA.RI.1. Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

The **M**ultidisciplinary **A**gricultural Integrated Curriculum (mAGic) was created in 2004 under the leadership of the Illinois State Board of Education (ISBE) and the Facilitating Coordination in Agricultural Education Project (FCAE). Funding was made available through the FCAE grant budget from the agricultural education line item of the ISBE budget. This revision, as printed, was developed in January 2021.



These mAGic lessons are designed to bring agriculture to life in your classroom. They address the Illinois Learning Standards in math, science, English language arts and social studies.

Illinois mAGic project update writers/reviewers: Rhodora Collins – Dekalb County; Suzi Myers – Kane County; Connie Niemann – Montgomery County; Debbie Ruff – Livingston County; Jennifer Waters – Sangamon County; Dawn Weinberg – Hancock County; and Carrie Winkelmann – Menard County.

Name _____

Sprouting Success in Illinois from North to South

Student Worksheet

Using the seed packet that you have been given, answer the following questions in complete sentences.

1. What kind of seeds are in your packet? (Keep in mind that there are different varieties of plants, so you should write the type of plant and the variety name, i.e. Cherry Belle Radish.)
2. What is one characteristic of this plant? (Read the description of the variety on the seed packet.)
3. How many days will it take for the seed to germinate?
4. How much soil should be covering the seed?
5. How far apart should the seeds be spaced?
6. How many days until the plant is mature?
7. Can this plant tolerate freezing weather?
8. Look at the map on the packet. When should you plant this seed?
9. What is the "sell by" date for this packet? Why is it important that you know this?
10. Are there any guidelines on the packet for harvesting your crop? What are they?

Name _____

Hardiness Zone Activity Sheet

Student Worksheet

Answer the following questions using the Illinois hardiness zone map.

1. Illinois consists of 5 different hardiness zones. Using the hardiness zone map for Illinois below, list the annual average temperature range (Fahrenheit) for the following zones:

Zone 5a _____ Zone 6b _____

Zone 5b _____ Zone 7a _____

Zone 6a _____

2. Locate your county and write what hardiness zone it is located. Name 5 other counties who share the same hardiness zone as your county.

My County: _____ Hardiness zone: _____

5 counties who share the same hardiness zone: _____

3. Why do you think there are different hardiness zones for different counties?

4. The first hardiness zone map was published in 1960 and was revised in 1965 and in 1990. With improvements in technology and recorded data, the plant hardiness zone map was again revised in 2012. These temperatures are based on the lowest temperatures recorded for each of the years from 1976 to 2005 in the U.S. Based on environmental trends, make a prediction of when the next revision of the hardiness zone map will be and what changes we might see in average annual temperatures.

Sprouting Success in Illinois from North to South

ANSWER KEY

1. **Zone 5a** -20 to -15 F

Zone 5b -15 to -10 F

Zone 6a -10 to -5 F

Zone 6b -15 to 0 F

Zone 7a 0 to 5 F

2. Answers will vary; depends on location.

3. Answers will vary.

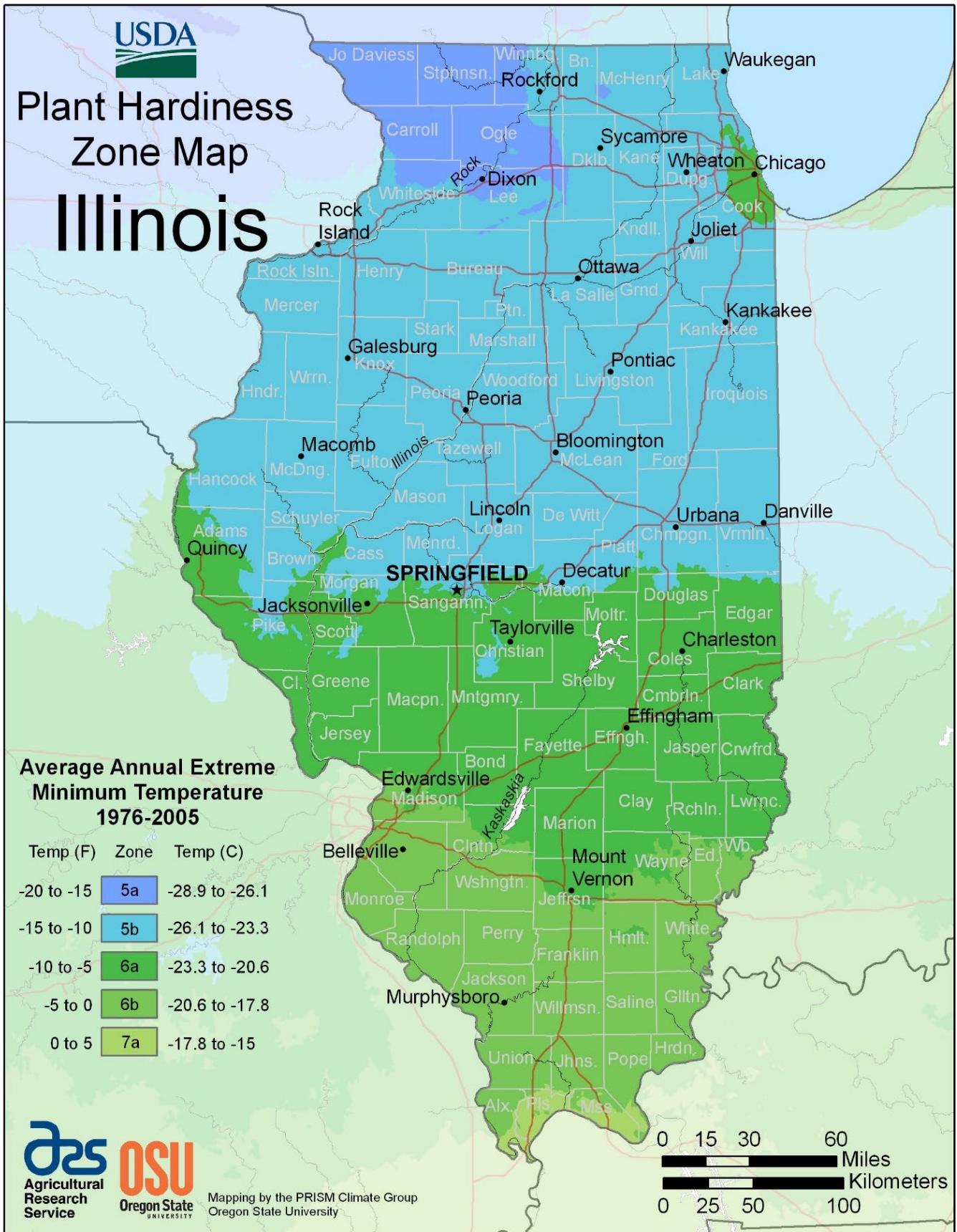
4. Answers will vary. Possible discussion includes global warming.



Plant Hardiness Zone Map Illinois

Average Annual Extreme Minimum Temperature 1976-2005

Temp (F)	Zone	Temp (C)
-20 to -15	5a	-28.9 to -26.1
-15 to -10	5b	-26.1 to -23.3
-10 to -5	6a	-23.3 to -20.6
-5 to 0	6b	-20.6 to -17.8
0 to 5	7a	-17.8 to -15



Mapping by the PRISM Climate Group
Oregon State University

