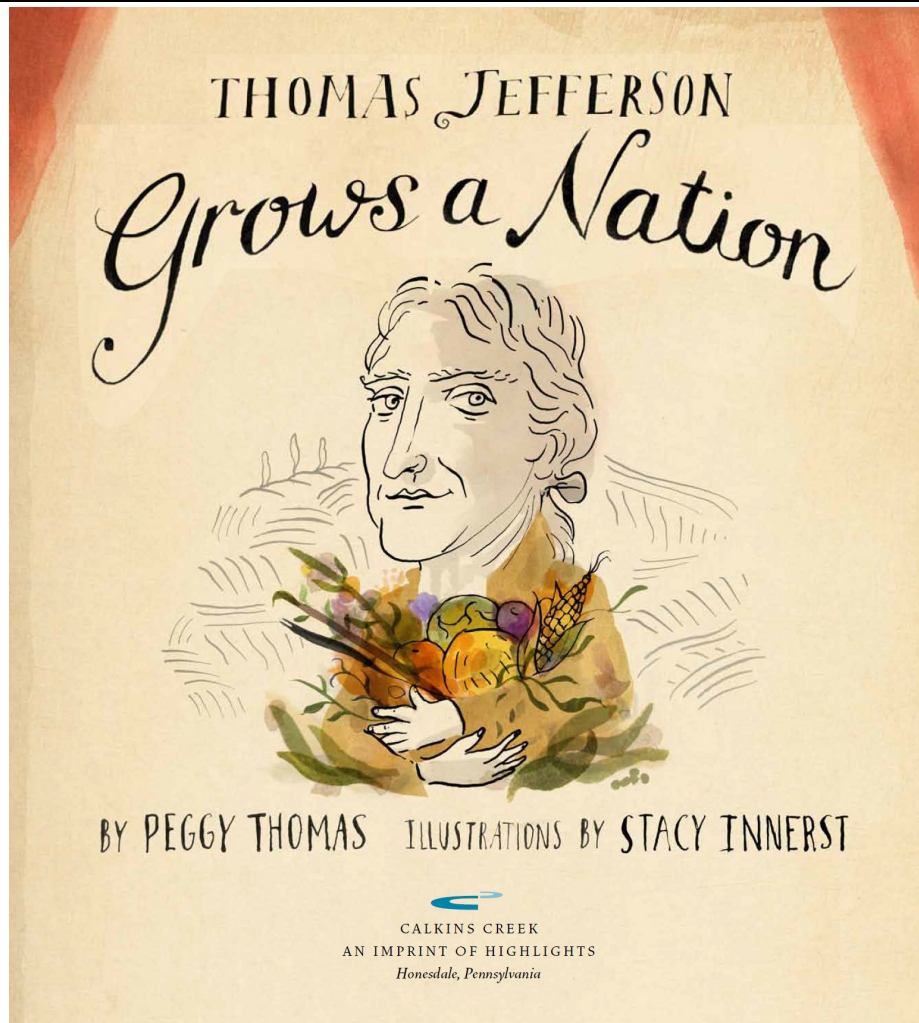


# Thomas Jefferson Grows a Nation



**A Complementary Lesson Booklet for  
*Thomas Jefferson Grows a Nation***



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# Shake, Rattle and Roll

For use with pages 4-5 in Thomas Jefferson Grows a Nation

**Objective:** The students will design an experiment to determine the type of soil found in a garden.

**Common Core:** ELA-Literacy.W.4.7; W.4.8; W.4.9

**Next Generation Science Standards:**

Earth's Place in the Universe: 4-ESS1

**Suggested Reading Materials:**

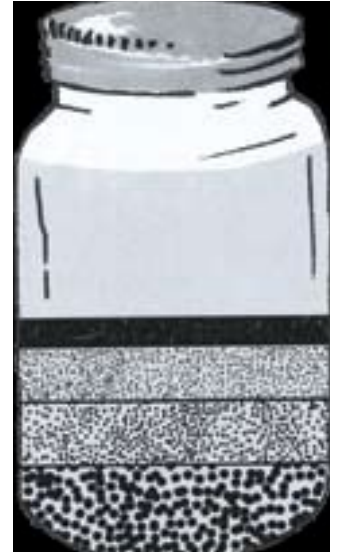
A Handful of Dirt by Raymond Bial, ISBN-10: 080-2786987

The Amazing Dirt Book by Paulette Bourgeois, ISBN-13: 978-0201550962

Soil Terra Nova—IAITC

**Materials Needed:**

Flour	Large glass jar with lid	Permanent marker
Sugar	Soil	Ruler
Water		



**Vocabulary:**

**Clay** - fine granular material composed of closely packed particles

**Loam** - ideal garden soil that has a well-balanced mixture of sand, silt and clay

**Sand** - coarse granular material composed of finely divided rock and mineral particles

**Silt** - sedimentary material composed of fine mineral particles in between size and clay

**Directions:**

1. Explain to the class that soil is made of three different types of particles: sand, silt, and clay. The perfect soil will contain an even mixture of all three. This is called loam soil.
2. Give each student a small sample of sugar, representing sandy soil. This soil does not usually grow plants well, as it dries out quickly and does not let the roots get enough water. Have the students describe the texture of the sugar. Next, allow students to feel a small sample of dry flour and rub it between their fingers. This is the powdery, silky texture of silt. Finally, add a small amount of water to the flour. This is the texture of clay. Clay particles clump together and compact when dry and drain poorly when wet. Have the students describe the texture.
3. Determine the type of soil in a garden by filling a large jar half-full with soil. Fill the remaining space with water. Have the students take turns vigorously shaking the jar until the larger clumps are broken apart. Let the jar sit for two minutes. Use a permanent marker to draw a line to mark each layer. Allow at least 24 hours for the soil to settle completely. The top layer will be clay, which includes the smallest, lightest particles. The middle layer will be silt, and the heaviest particles fall to the bottom, sand. Have the students identify the thickest layer to determine the soil type.
4. Have the students measure and graph the separate layers in centimeters. Divide the class into groups to duplicate the activity with soil from different areas. Students can record, graph and compare their findings.

**Lesson Extender:**

Ask the students how this activity might influence where they plant a garden. How would the soil impact how the garden grows?

This lesson has been adapted from a California Ag in the Classroom lesson activity.

# Symbolizing Our State

For use with page 10 of Thomas Jefferson Grows a Nation

**Objective:** The students will design a seal, slogan, and symbols to represent the school. Then they will justify their representations in a written paragraph and present them to the class.

**Common Core Standards:** ELA-Literacy.W.4.2; SL.4.4; L.4.1

Each of the United States has a set of official symbols. These symbols are meant to show many different aspects of the state. Some of these icons are meant to symbolize the common types of living things in the state, and some symbols represent the values of the people who live there. Take a look at some of Illinois's symbols below. Then complete the activity on the next page.

State Seal: 1868



State Mammal: White Tailed Deer—1982



State Slogan: "Land of Lincoln"

State Snack Food: Popcorn—2003





# Symbolizing Our State

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**Directions:**

In groups or individually, design a seal and a slogan for your school. Then, choose three symbols that represent your school (bird, vegetable, fruit, animal, sandwich...etc). On a separate sheet of paper, write a few sentences to explain how each symbol, your seal, and your slogan represent your school.

**School Name:** \_\_\_\_\_

**School Slogan:** \_\_\_\_\_

**School Seal**

**Official School** \_\_\_\_\_  
(Type of Symbol)

**Official School** \_\_\_\_\_  
(Type of Symbol)



**Official School** \_\_\_\_\_  
(Type of Symbol)

# Urban vs. Rural

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For use with page 17 of Thomas Jefferson Grows a Nation

**Objective:** The students will compare and contrast different types of communities.

**Common Core Standards:** Language Arts: CCSS.ELA-Literacy.SL.3.4; SL.3.6; L.3.5

**Suggested Reading Materials:**

Town Mouse, Country Mouse by Jan Brett, ISBN-13: 978-0698119864

County Kid, City Kid by Julie Cummins, ISBN-13: 978-0805064674

**Materials:**

Poster board

Magic markers

Magazines

Newspapers

Scissors

Glue

**Directions:**

Ask the students to list the characteristics of urban and rural communities. Make a list on the board or on chart paper. Encourage students to discuss the following aspects of communities: transportation, schools, homes, shopping, nature, businesses.

1. Read with students the book Town Mouse, City Mouse by Jan Brett.
2. After reading the book, look again at the list you made of characteristics of urban and rural communities.
3. Give each student a copy of the Venn diagram and ask them to list characteristics of each that they observed in the book. Be sure to have them include areas where the two communities were similar in the center of the Venn diagram.
4. Have students discuss what characteristics define each community and which are similar to both communities.

**Lesson Extender:**

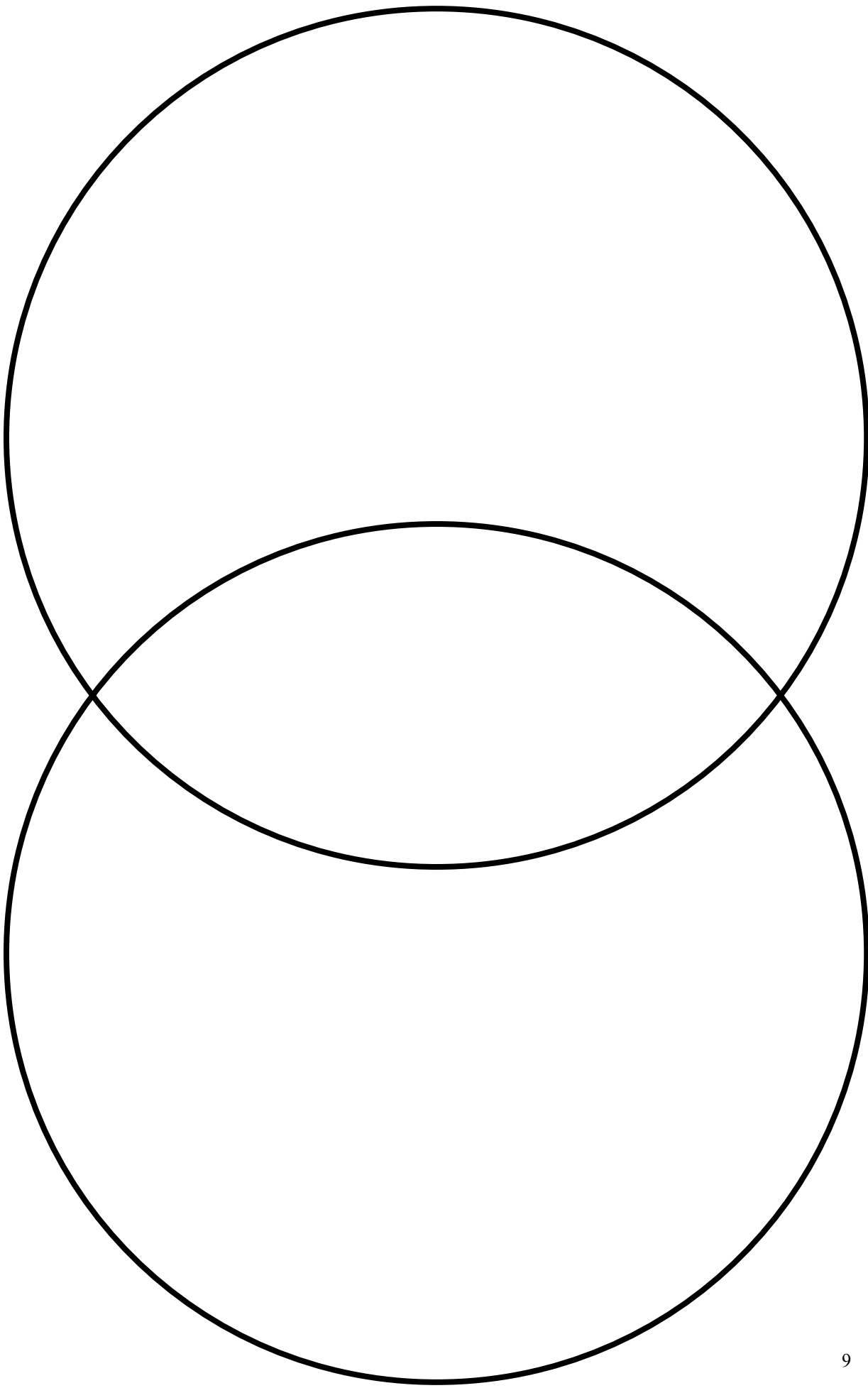
What type of community do you live in? Ask students to cut out pictures from magazines or newspapers of anything that reminds them of their community. They will take these pictures and paste them to poster board to make a collage. In class, they can share their collages with their classmates and discuss similarities and differences of the collages they made. What type of community has the most people in it? How are the communities different? How are the communities the same?





## Venn Diagram

Write details that tell how the subjects are different in the outer circles. Write details that tell how the subjects are alike where the circles overlap.



# Specimen Box

For use with pages 14-15 of Thomas Jefferson Grows a Nation

**Objective:** Students will be able to identify differing traits possessed by a variety of plant life.

**Common Core:** ELA-Literacy.SL.3.1; SL.3.3; SL.3.4; L.3.6.

**Next Generation Science Standards:**

Heredity: Inheritance and Variation of Traits: 3-LS3-1, 3-LS3-2

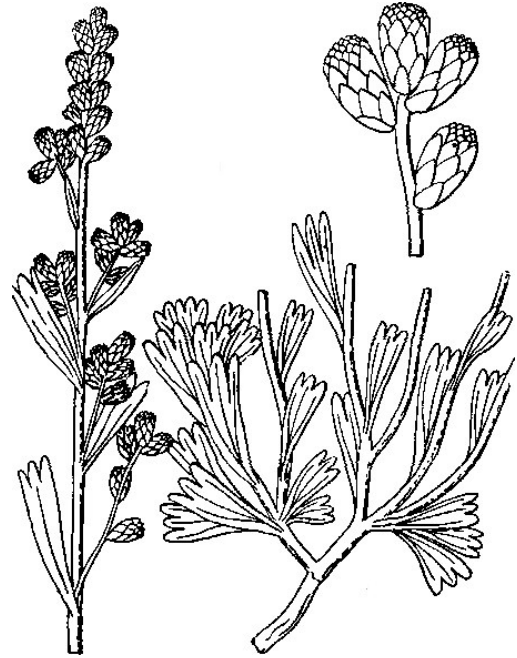
Engineering Design: K-2-ETS1.B.

**Suggested Reading Materials:**

Tell Me, Tree: All About Trees for Kids by Gail Gibbons,  
ISBN-13: 978-0316309035

The National Audubon Society First Field Guide: Trees  
by Marjorie Burns and Brian Cassie, ISBN-13: 978-0590054904

A Seed is Sleepy by Diana Hutts Aston and Sylvia Long,  
ISBN-13: 978-1452131474



**Materials:**

Pencils            Notebooks/notepads  
Glue                Felt                    Straight pins  
Boxes (small gift boxes, bakery boxes, or shoe boxes work)  
Tweezers and baby food jars optional

**Directions:**

1. Give every student a box, or have them bring a cardboard box from home. Glue felt to the inside of the box to create a smooth lining along the bottom.
2. Take the students outside to explore the plant-life surrounding the school. Explain to them the importance of treating the plants with respect and not to be too harsh with them, or to remove too much of the plants when collecting examples.
3. When the students find a new leaf, seed, or flower specimen they should first sketch the example in a notebook. That way, the sketch will best represent what the specimen looks like in its natural setting.
4. Have the students then, carefully, collect the example of the leaf, seed or flower pedal, making sure to take the very minimum needed to still see key features of the specimen.  
\*\*You can also have the students collect insects inside the baby food jars, just poke holes in the lids.
5. The students should pin their examples to the felt inside their specimen box so that the specimens are clearly visible, and so they do not move around and get damaged inside the box.
6. Display the specimen boxes around the classroom and allow the students to view one another's examples and to add to their sketch book.
7. Discuss the similarities and differences in the different examples collected by the students. What unique features does each example have? What purpose does that feature serve? Why would that be an important adaptation for the specimen to thrive in your area?

# Hessian Fly Life Cycle

For use with pages 20-21 in Thomas Jefferson Grows a Nation

**Objective:** Students will create a model of the Hessian Fly's life stages to better their understand that organisms have unique and diverse life cycles.

**Common Core:**

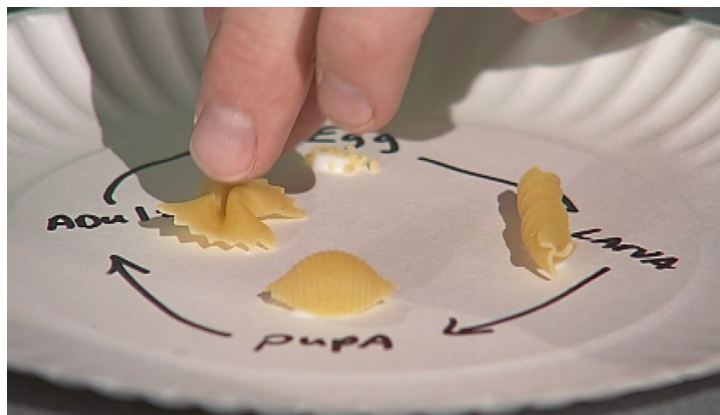
ELA-Literacy.RI.3.3; RI.3.7; W.3.2

**Next Generation Science Standards:**

Biological Evolution: Unity and Diversity: 2-LS4-1  
From Molecules to Organisms: Structures and Processes: 3-LS1-1

**Materials Needed:**

- Paper Plates
- Marker
- Elmer's Glue
- Pasta:  
four different types (couscous, rotini, shells, bow-ties)



**Directions:**

1. Give each student a paper plate.
2. Using a marker, have them write out the names of the four stages on the paper plate. "Egg" at the top left, "Larva" at the top right, "Pupae" at the bottom right, and "Adult" at the bottom left.
3. Draw arrows clockwise from "Egg" to "Larva" and from "Larva" to "Pupae" and so forth.
4. Put a dot of glue under "Egg" and drop a pinch of couscous on it for the egg.
5. Put a dot of glue next to "Larva" and place two rotini pasta on it for the two larva.
6. Put a dot of glue next to "Pupae" and place two of the shells on it for the pupae.
7. Put a dot of glue next to "Adult Hessian Fly" and place the bow-tie on it for the adult fly.

**Lesson Extender:**

In 2-3 sentences for each stage, describe what fly's life cycle looks like. Which stage was Thomas Jefferson referring to when he said the "Worm-state?"



# Navigating Illinois Waters

For use with pages 30-31 of Thomas Jefferson Grows a Nation

**Objective:** After completing this exercise, students will have a better understanding of reading maps as well as the diversity of specialty crops in Illinois.

**Common Core:** Language Arts: CCSS.ELA-Literacy.RI.4.1; RI.4.7; RF.4.4; W.5.7

**Next Generation Science Standards:** Interdependent Relationships in Ecosystems: 3-LS4-3

## Suggested Reading Materials:

Illinois AITC Water Ag Mag

There's a Map On My Lap, by Tish Rabe, ISBN-13: 978-0375810992

Scrambled States of America by Laurie Keller, ISBN-13: 978-0805068313

## Materials:

Access to the Internet

Illinois Maps

Markers or crayons

## Directions:

Using the Illinois county map on the next page, follow the directions below:

1. Draw a triangle where your hometown belongs, then label it.
2. Misi-züibi is an Ojibwa Indian word which means “big river.” It is where the Mississippi River got its name. Highlight the Mississippi River.
3. The Illinois River was an important route for French Traders and Native Americans to travel from the area near the Great Lakes to The Mississippi River. Draw the Illinois River.
4. Very early in their voyage, Lewis and Clark traveled from Ohio, down the Ohio River, passed where the Wabash and Ohio Rivers meet. Find and color the Wabash River, and with a different color, trace the Ohio River.
5. The largest lake that is entirely within the State of Illinois is actually man-made. Find the Carlyle Lake Reservoir and draw it on the map.
6. Every year, over 200 million tons of cargo are shipped through the Great Lakes. Much of this leaves or enters Chicago through Lake Michigan. Color Lake Michigan Blue.
7. Some Illinois counties have natural borders that follow rivers. Find some of these counties and color them in Orange.
8. The point where the Kaskaskia River meets the Mississippi river (confluence) changed in 1881. Draw the Kaskaskia river in Red.

## Lesson Extender:

Do some extra online research to answer the following questions:

*Who built Carlyle Lake, and for what purpose?*

*Southern Illinois is bordered by three different rivers. What effect does this have on soil in the area? What about the crops?*

*The confluence of the Kaskaskia and Mississippi River changed? How did this happen?*



# Plot-a-Lot

For use with pages 30-31 of Thomas Jefferson Grows a Nation

**Objective:** After completing this exercise, students will be able to plot geometric shapes and calculate the area of those shapes, based on a scale.

**Common Core:** Math.Content.3.MD.5; 3.MD.6; 3.MD.7; 3.MD.8

## Materials:

Graph paper (provided on page 16 of this booklet)

Pencil

Ruler

Calculator \*optional

## Intro:

After reading *Thomas Jefferson Grows a Nation*, discuss his desire to raise and grow a variety of different commodities on his own land and across the nation. In order to do so, he had to plot out how to use the land on his farm, Monticello. Similarly, he went on to design the University of Virginia campus.

## Directions:

Review calculating area with your students.

1. Draw an example rectangle and label the sides 5 centimeters and 8 centimeters.
2. Ask the students how to calculate the area of the rectangle.

Area = Length x Width

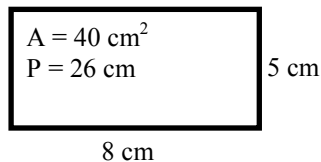
$A = L \times W$

$A = (8 \text{ cm}) \times (5 \text{ cm})$

$A = 40 \text{ (cm} \times \text{cm)}$

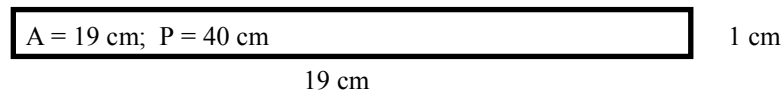
$A = 40 \text{ cm}^2$

Area = 40 square centimeters



Review calculating perimeter with your students.

1. Draw an elongated rectangle and label the sides 1 cm, and 19 cm.

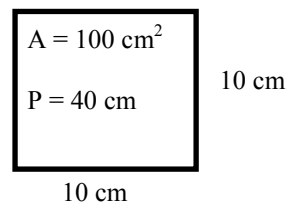


2. Draw a square rectangle. Label the sides 10 cm, and 10 cm.
3. Ask the students to calculate the perimeter of each rectangle.

Perimeter = sum of the lengths of every side.

4. Calculate the area of each rectangle.

\*Note the difference between cm and  $\text{cm}^2$



5. Notice how the rectangles can have the same perimeter and differing areas. They can also have similar area and differing perimeter. (e.g. 5 cm x 20 cm)
6. Have the students use this information to complete pages 15 and 16 in this booklet.



# Plot-a-Lot

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## Intro:

Thomas Jefferson designed and mapped out the University of Virginia and his home, Monticello. He had to map out his farm to make the best use of the land. On a separate sheet of graph paper, use these same skills to design your own farm. Design your farm to make the best use of your available land, using the rules provided.

## Directions:

1. Read all the directions before beginning.
2. On your graph paper, **1 square = 1 unit** of land. Draw a rectangle **20 units by 30 units**. This space represents all the land you own.  
What is the total area of the space you own? \_\_\_\_\_
3. You need a house to live in. Somewhere on your land, draw a plot for your house that has a length of 3 units and width of 3 units. Label your house.
4. With the remaining space, plot and label the areas where you will raise cattle, raise pigs, grow corn, and grow soybeans. You can plot as much space as you like for each commodity as long as it fits on your land. You must plot all four commodities and follow the rules below:
  - A. Commodity plots cannot overlap, or overlap with your house.
  - B. All plots must use only vertical or horizontal lines (no diagonal).
  - C. Your cattle plot must have an area of **at least** 50 units<sup>2</sup>.
  - D. Your corn plot must have a **length** of at least 10 units.
  - E. Your soybean plot must have **equal length and width**.
  - F. Your pig plot must have a perimeter of **exactly** 32 units
5. Complete the chart below with the length, width, perimeter, and area of each of your commodity plots.

Commodity	Length (units)	Width (units)	Perimeter (units)	Area (Units <sup>2</sup> )
Corn				
Soybeans				
Cattle				
Pigs				

## Lesson Extender: Make a Profit!

Your commodities make money back depending on the amount of space you provided for each one.

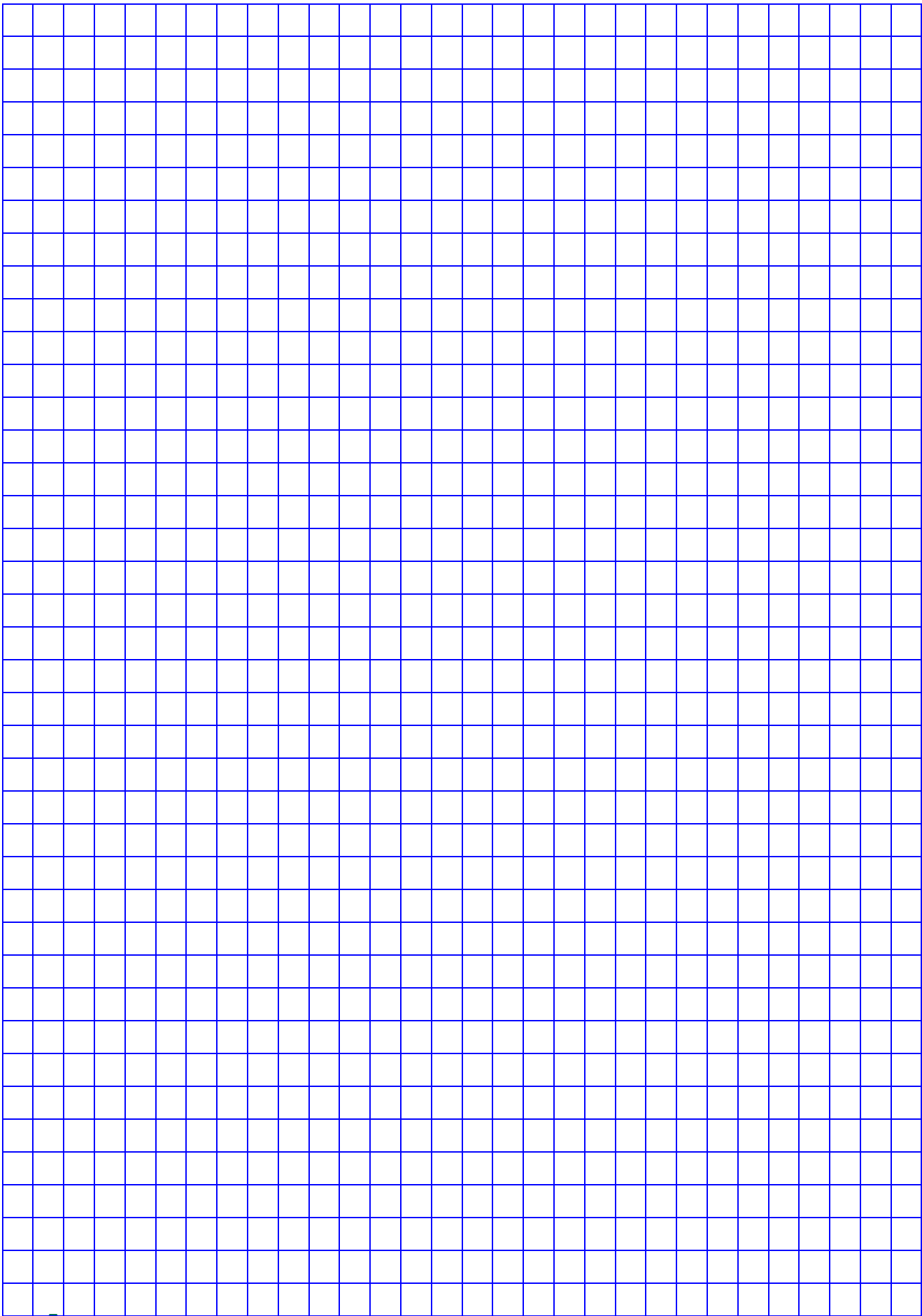
**Corn:** Earn \$2 for every 5 units<sup>2</sup>.

**Soybeans:** Earn \$1 for every 2 units<sup>2</sup>

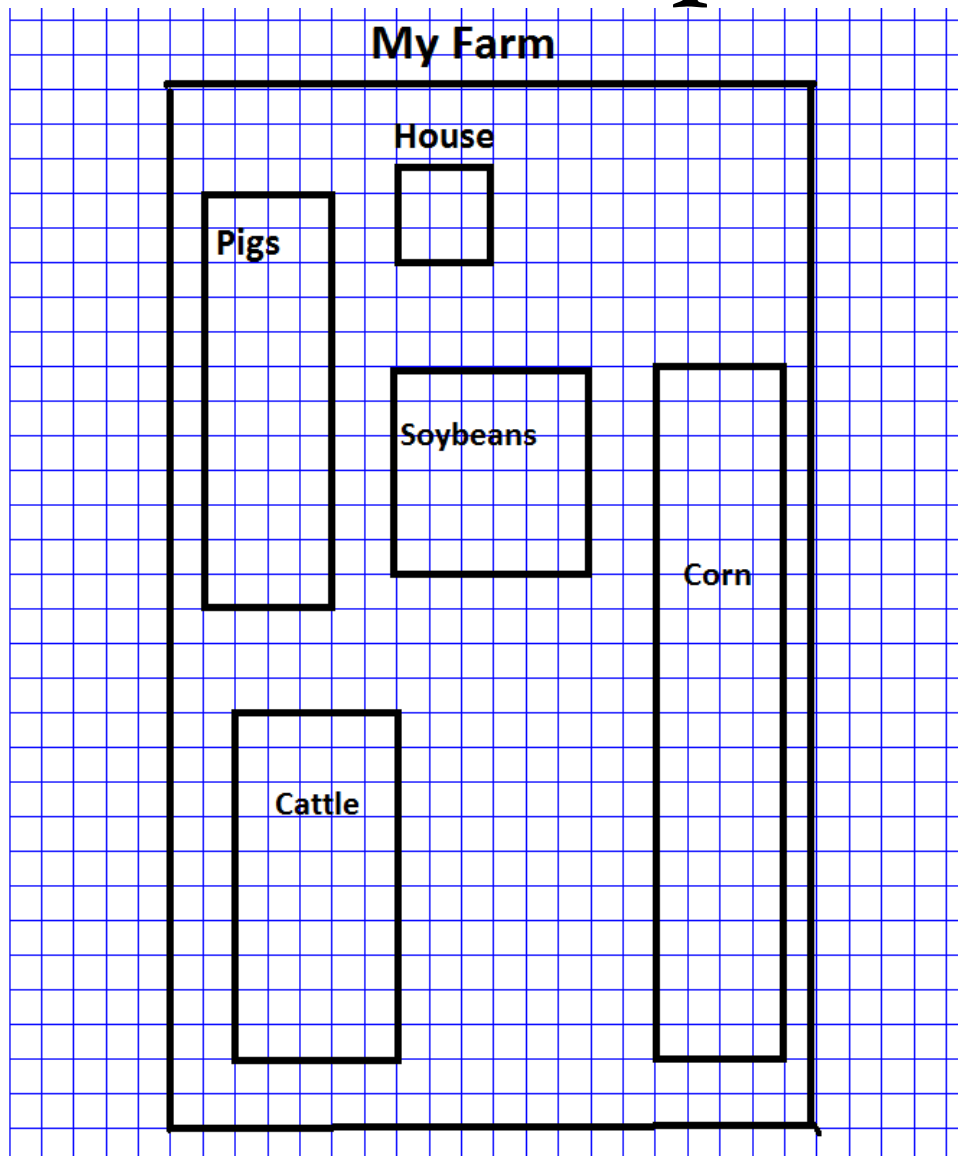
**Cattle:** Earn \$5 for every 10 units<sup>2</sup>.

**Pigs:** Earn \$3 for every 6 units<sup>2</sup>.

Does this change how you would plot your farm? Try again to make the most money!



# Plot-a-Lot Example



Commodity	Length (units)	Width (units)	Perimeter (units)	Area (Units <sup>2</sup> )
Corn	20	4	48	80
Soybeans	6	6	24	36
Cattle	10	5	30	50
Pigs	12	4	32	48

# Navigating Illinois Waters Answers

## #7—Counties with Natural Borders

### On Mississippi River

Jo Daviess  
 Carroll  
 Whiteside  
 Rock Island  
 Mercer  
 Henderson  
 Hancock  
 Adams  
 Pike  
 Calhoun  
 Jersey  
 Madison  
 Saint Clair  
 Monroe  
 Randolph  
 Jackson  
 Union  
 Alexander

### On Ohio River

Pulaski  
 Massac  
 Pope  
 Hardin  
 Gallatin

### On Wabash River

Clark  
 Crawford  
 Lawrence  
 Wabash  
 White

### On Interior Rivers

(and not previously listed)

Greene  
 Scott  
 Brown  
 Morgan  
 Schuyler  
 Cass  
 Mason  
 Fulton  
 Tazewell  
 Peoria  
 Woodford  
 Marshall  
 Putnam  
 Sangamon  
 Christian  
 Johnson  
 Moultrie  
 Shelby

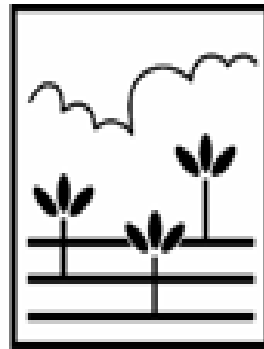




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