

Agriculture Measures Up

Grade Level: 4-8

Lesson Overview

Students will need to use problem-solving methods and everyday math to make a common decision of how much fertilizer to purchase to nourish their lawn. By calculating the area of the lot, driveway, patio, house and garage, each student will determine the number of bags of fertilizer needed to cover only the space left for grass.

Student Objectives

1. Students will be able to add and subtract whole numbers.
2. Students will be able to multiply any two decimals.
3. Students will be able to measure lengths to the nearest millimeter or 1/8 inch.
4. Students will be able to write terminating decimals as fractions and vice versa.

Materials

- ✓ plastic rulers
- ✓ scissors
- ✓ glue
- ✓ student worksheets:
 - The Grass is Always Greener
 - House Lot Diagram
 - Diagram of House, Patio, and Driveway

Vocabulary

- **fertilizer** - substance that plants need to grow.

Procedure

1. Explain to the students that they have a new lawn and garden fertilizer spreader.
2. To fertilize their lawn, they must first determine how much fertilizer to purchase. The fertilizer bag they will purchase contains enough fertilizer to cover 5,000 square feet.

The question to be answered is, “How many bags of fertilizer must be purchased to fertilize each lawn?”

3. Give each student House Lot Diagram; Diagram of House, Patio, and Driveway; The Grass is Always Greener student worksheets to complete.

4. The teacher should explain how to measure a given area to determine square feet of space.
5. Have students use scissors to cut out the house (with garage), patio, and driveway. Then, using their own layout design, have them glue the 3 pieces to the House Lot Diagram.

NOTE: If saving time is necessary, instead of having students design their own layout, this can be done ahead of time and made into a master for copies.

6. Students should then complete The Grass is Always Greener student worksheet to determine the number of square feet in the house lot, the house and garage, the patio, and the driveway. Students should record these answers in the appropriate places on each of the diagrams.

NOTE: The scale used in these diagrams is 1 inch = 10 feet. All measurements should be read to the nearest one-half inch.

NOTE: The Grass is Always Greener student worksheet questions 8 thru 12 require experience in fraction, decimal and percentage computations. If students are not at this level these questions can be done as a group.

Extension Activities

Have students use their home lots to measure and determine how much fertilizer is needed.

Additional Resources

- <https://www.youtube.com/watch?v=CAkHja2Qn0o&feature=youtu.be> video showing how to measure your lawn for grass coverings

Standards

Illinois Mathematics Standard

7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

Illinois English Language Arts Standard

RST 1: Cite specific textual evidence to support analysis of science and technical texts.

The **M**ultidisciplinary **A**gricultural **I**ntegrated **C**urriculum (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 April 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.

Soil 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; and Dawn Weinberg – Hancock County.

Name _____

House Lot Diagram Student Worksheet

House Lot L= _____ W= _____ square feet = _____

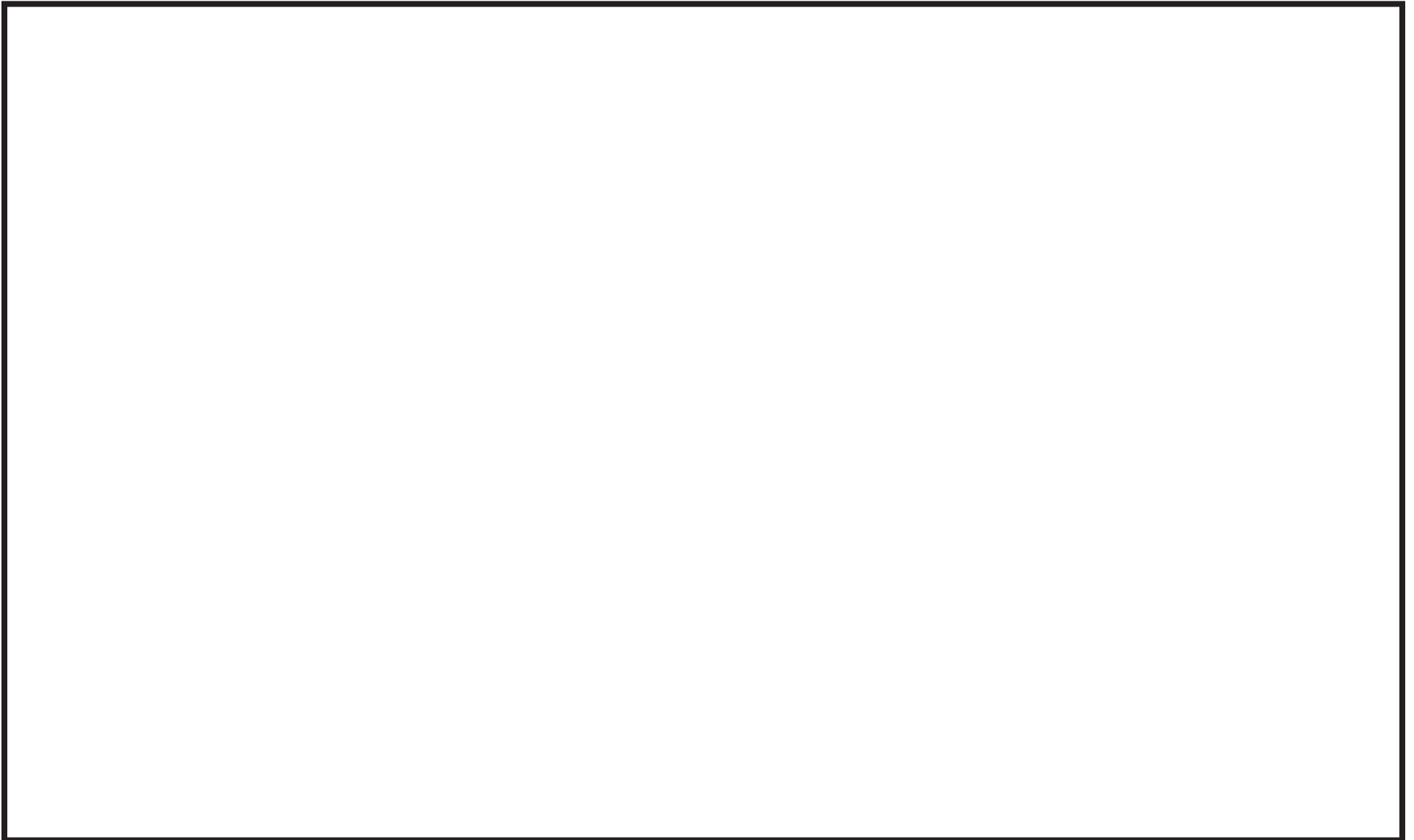


Diagram of House, Patio, and Driveway Student Worksheet

<p>House and Garage</p> <p>L= _____ W= _____</p> <p>Sq. Ft.= _____</p>	
<p>Note: Do not cut on dotted lines. →</p>	
<p>Garage</p>	
<p>Driveway</p> <p>L= _____ W= _____</p> <p>Sq. Ft.= _____</p>	<p>Patio</p> <p>L= _____ W= _____</p> <p>Sq. Ft.= _____</p>

Name _____

The Grass is Always Greener Student Worksheet

SCALE: 1" = 10' (one inch = ten feet) NOTE: All measurements should be read to the nearest one-half inch. Show all of your work in completing this worksheet.

1. How many square feet are in the house lot?
2. How many square feet are covered by the house and garage?
3. How many square feet are covered by the patio?
4. How many square feet are covered by the driveway?
5. How many square feet do the house and garage, patio and driveway cover?
(2, 3, and 4 above)
6. How many square feet of the house lot are left for grass?

7. How many bags of fertilizer are needed to cover your number of square feet of grassed area?

8. What fraction of the lot is covered by the house and garage, patio and driveway?

9. What fraction of the house lot is NOT covered by the house and garage, patio and driveway?

10. Convert # 8 above from a fraction to a percent.

11. Convert # 9 above from a fraction to a percent.

12. Determine the percentage of the purchased fertilizer that will be spread on the grassed area. Hint: This percentage can be determined by dividing the square feet of lawn to be fertilized by 5,000 sq ft and multiplying by 100.

The Grass is Always Greener Student Worksheet ANSWER KEY

SCALE: 1" = 10' (one inch = ten feet) NOTE: All measurements should be read to the nearest one-half inch. Show all of your work in completing this worksheet.

1. How many square feet are in the house lot?
Answer = 6,000 square feet
2. How many square feet are covered by the house and garage?
Answer = 1,000 square feet
3. How many square feet are covered by the patio?
Answer = 200 square feet
4. How many square feet are covered by the driveway?
Answer = 300 square feet
5. How many square feet do the house and garage, patio and driveway cover?
(2, 3, and 4 above)
Answer = 1,500 square feet
6. How many square feet of the house lot are left for grass?
Answer = 4,500 square feet
7. How many bags of fertilizer are needed to cover your number of square feet of grassed area?
Answer = 1 bag
8. What fraction of the lot is covered by the house and garage, patio and driveway?
Answer = 1,500/6,000 or 1/4
9. What fraction of the house lot is NOT covered by the house and garage, patio and driveway?
Answer = 4,500/6,000 or 3/4
10. Convert # 8 above from a fraction to a percent.
Answer = $1/4 \times 100/1 = 100/4 = 25\%$
11. Convert # 9 above from a fraction to a percent.
Answer = $3/4 \times 100/1 = 300/4 = 75\%$
12. Determine the percentage of the purchased fertilizer that will be spread on the grassed area. Hint: This percentage can be determined by dividing the square feet of lawn to be fertilized by 5,000 square feet and multiplying by 100.
Answer = $4,500/5,000 \times 100 = 90\%$

House Lot ANSWER KEY

Note: This arrangement of house, garage, patio and driveway is not a layout or plan for a house lot design - it is for calculating length, width, and square feet.

House Lot **L= 100 W= 60 square feet = 6,000**

