



Using Math to Determine Land Value- Past, Present, Future

Lesson Overview

This lesson uses ratios and proportional relationships to determine the change in value of land over a period of 166 years. This lesson can be completed individually, in pairs, or in small groups. It can be completed as a guided class activity or individual work depending on your students' level of achievement. It can be used in the middle of a unit of study, or as a final assessment piece. *Recommended for grade 7.*

Standards

Common Core Standards Covered:

Ratios and Proportional Relationships: Analyze proportional relationships and use them to solve real-world and mathematical problems

- CCSS.MATH.CONTENT.7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
- CCSS.MATH.CONTENT.7.RP.A.2 Recognize and represent proportional relationships between quantities.
- CCSS.MATH.CONTENT.7.RP.A.2.A Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
- CCSS.MATH.CONTENT.7.RP.A.2.C Represent proportional relationships by equations.
- CCSS.MATH.CONTENT.7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

Time Required

60-90 minutes

Materials & Resources

- Beautiful Acres Worksheets 1-3
- Calculators (optional, but please note that some of the equations are large)

Lesson Procedure

1. Explain that land is sold by the acre. An acre is a unit to measure area. An acre is approximately 4,840 square yards (you could then figure out how many square feet or how many square inches). During the middle ages the acre was used to describe how much land could be plowed in a day by one ox. To put an acre into a context that students may better understand, explain that an acre is approximately the size of a football field without the end zones. If you are at a school with access to a football field, consider walking your students onto the field so that they can “walk an acre” or teaching the lesson on the football field to put it into perspective.

2. There are three worksheets which accompany this lesson and require students to use different math skills. They can be completed individually or as a group.
 - a. The first two worksheets use proportions to determine the cost per acre and the value of two different sized properties.
 - b. The third worksheet uses answer from the first two worksheets so that students can calculate the difference in cost over the years, percentage change in value, average percent of change per year, and average increase (in dollars) per year.
 - c. All three worksheets also require students to use critical thinking to consider why property in different locations is worth more and why land values have increased over time.

Extension

Use the internet to research the value of land in other cities in the United States. Compare them to that of Nashville. Why do you think there is a difference in value?

Lesson Evaluation

This lesson can be formally evaluated or informally evaluated.

Worksheet 1 Answers:

1. \$20 per acre; \$256 for 12.8 acres
2. \$60 per acre; \$31.20 for .52 acres
3. \$45,000 per acre; \$11,700 for .26 acres
4. \$.6 per acre; \$.12 for .2 of an acre
5. Answers can include location, buildings/development on property, access to water, trade, doctors, work etc. Basically looking for students to use some critical thinking skills here.

Worksheet 2 Answers:

1. \$70,312.5 per acre; \$140,625,000 for 2,000 acres
2. \$961,538.46 per acre; \$57,692,307.6 for 60 acres
3. \$61,538,461.53 per acre; \$12,307,692.31 for .2 acres
4. \$145,000 per acre; \$153,990,000 for 1,062 acres
5. Answers can include location, buildings/development on property, access to water, trade, doctors, work etc. Basically looking for students to use some critical thinking skills here

Worksheet 3 Answers:

Location	Cost in 2016	Cost in 1850	Difference
1. Fairvue Plantation	\$70,312.5	\$20	\$70,292.5
2. Belmont Mansion	\$961,538.46	\$60	\$961,478.46
3. Cherry Street	\$61,538,461.53	\$45,000	\$61,493,461.53
4. Point Coxe, Texas	\$145,000	\$.60	\$144,999.4

Location	Percent Change in value	Percent change per year	Average increase (in dollars)
1. Fairvue Plantation	351,463%	2,117%	\$423
2. Belmont Mansion	1,602,464%	9,653%	\$5,792
3. Cherry Street	136,541%	823%	\$370,350
4. Point Coxe, Texas	\$145,000	\$.60	\$144,999.4

Name _____

Date _____

Beautiful Acres: Worksheet 1

Below are some plots of land Adelia owned in 1850, including their value at that time.

1. Adelia lived on **2,000** acres of land at Fairvue Plantation with her first husband. The land was worth **\$40,000**. Calculate the cost per acre and how much the land would have been worth if there were only **12.8** acres.

2. Belmont Mansion sat on an estate made up of **60** acres of land which cost Adelia **\$3,600** when she first purchased it. Calculate the cost per acre and how much she would have spent if she purchased **.52** acres instead.

3. Adelia's home in downtown Nashville sat on a **.2** acre lot on Cherry Street (today 4th Avenue between Church and Broadway) and was worth **\$9,000**. Calculate the cost per acre and determine how much the lot would have cost if it were **.26** of an acre.

4. Adelia inherited **1,062** acres of land near Point Coxe, Texas from her first husband. It was worth **\$637.20**. Calculate the cost per acre and determine how much the property would have been worth if she only owned **.2** of an acre.

5. Make a list of reasons why you think acres in one location might be worth more (or less) than acres in another location.

Name _____

Date _____

Beautiful Acres: Worksheet 2

In 2016, plots of land near Adelia's original property were for sale.

1. A new owner of Fairvue Plantation purchased **12.8** acres for **\$900,000**. Calculate the cost per acre and determine how much Adelia's original **2,000** acres would cost today.

2. A **.52** acre lot near Belmont Mansion was recently listed for **\$500,000**. Calculate the cost per acre and determine how much the estate's original **60** acres would cost today.

3. A **.26 acre** lot on Lower Broadway just south of Cherry St. (4th Avenue) recently sold for **\$16,000,000**. Calculate the cost per acre and determine how Adelia's **.2** acre lot would cost today.

4. A **.2 acre** lot near Point Coxe, Texas (Point Comfort) was recently listed for **\$29,000**. Calculate the cost per acre and determine how Adelia's **1,062** acres would cost today.

5. Make a list of reasons why you think the value of these properties have increased and why some are worth more than others.

Name _____

Date _____

Beautiful Acres: Worksheet 3

Using your cost per acre answers from Worksheet 1 and 2, calculate the difference in cost per acre between 1850 and 2016 (166 years).

Location	Cost of an acre in 2016?	Cost of an acre in 1850?	Difference in Cost in 166 years? (Round to nearest 2 nd decimal place)
1. Fairvue Plantation			
2. Belmont Mansion			
3. Cherry Street			
4. Point Coxe, Texas			

Using the difference in value from 1850 to 2016 determine the percent change as well as the average amount of change per year. Round all answers to nearest whole number.

Location	Percent change in value	Average percent of change per year	Average increase (in dollars) per year
4. Fairvue Plantation			
5. Belmont Mansion			
6. Cherry Street			
7. Point Coxe, Texas			

8. If these plots of land sold 166 years from now, do you think the price would go up or down. Why?