

THE THREE LITTLE PIGS

music by W.A. MOZART adapted by JOHN DAVIES

MATH: Rebuilding a House

Students will

- Use mathematical operation to solve real world situations.
- Utilize charts and analyze data to answer questions

Copies for Each Student

- “The Story of the Opera”
- Glossary
- Cost Analysis Chart
- Activity Worksheet

For the Teacher

- “The Story of the Opera”
- Glossary
- Cost Analysis Chart
- Activity Worksheet
- **ANSWER KEY**

Getting Ready

Decide which section(s) of the lesson you wish your group to complete.

Gather materials:

- Notebook paper
- Pencils

Instructional Time

One 45-minute class period

Introduction

Read “The Story of the Opera” with your class. Tell students that Don Giovanni’s and Cherubino’s homes were blown away due to Wolfgang’s “huffing and puffing”, and while we don’t have wolves that “huff and puff”, many people in Texas and Oklahoma have recently experienced damage to their homes due strong winds from tornados. Many people have had to repair or rebuild their homes. Ask students tell you what kinds of materials are needed to build or repair houses and why those types of materials are used (i.e. concrete is used as a foundation, paint is used to “make it pretty” but also protects the walls and wood). Then guide the discussion asking students to estimate the cost of these materials and other expenses that may be incurred if they were rebuilding their own home.

Guided Practice

Present the Cost Analysis Chart to the class. Be sure the students understand the different kinds of expenses associated with rebuilding a home and how those expenses vary depending on the amount of materials used. If any of the terms on the chart are unfamiliar to you or students, please refer to the Glossary for definitions.

Independent Practice

Depending on your grade level, the ability of your students, and time constraints, you may choose to have students work as a whole class, in small groups, with a partner, or individually. Read the instructions on the Activity Worksheet and have the students fill in the missing information on the Cost Analysis Chart. Then, tell students to complete the Activity Worksheet using information from the chart.

If time allows

In small groups, have the students change the number of materials being used to create a new “Cost Analysis Chart”. Then have the groups swap charts and see which groups can complete the new projected costs first.

Evaluation

1. Did the students participate in the introductory discussion?
2. Were students able complete the list of expenses that incurred when rebuilding a house?
3. Were students able to complete the Activity Worksheet with 80% accuracy?

TEKS

Mathematics

Grade 4

(1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. (A. B. E. G.)

(2) E Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. (E)

(4) Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. (A. B.)

Grade 5

(1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. (A. B. E. G.)

(2) Number and operations. The student applies mathematical process standards to represent, compare, and order positive rational numbers and understand relationships as related to place value. (C)

Correlates: Language Arts

Gardner’s Intelligences: Linguistic, Logical-Mathematical

Bloom’s Taxonomy: Understand, Analyze, Evaluate

References:

<http://operatales.com/three-little-pigs.shtml> Accessed on 12/11/15

<http://www.aqua-calc.com/calculate/volume-to-weight/substance/cement-coma-and-blank-mortar> Accessed on 4/30/16

<http://www.sketchup3dconstruction.com/const/home-construction-cost-estimate-sheet.html> Accessed on 4/30/16

The Story of the Opera

The Three Little Pigs is a one-act opera adapted by John Davies from the traditional fairy tale featuring music by Wolfgang A. Mozart.

The story begins with three little pigs at their mother's house. Despina, a little girl pig who loves going to the library, is reading a book. Her brothers, Cherubino and Don Giovanni, have not yet learned how useful the library can be. But they are about to find out, for Wolfgang Bigbad, the Big Bad Wolf, is on his way. Despina explains that it is time for them to build their own house, and immediately her two brothers begin to argue about the choice of building materials. Cherubino claims that straw is the best; however, Don Giovanni is sure that sticks would be better. They turn to Despina to settle the argument and she tells them that she is going to the library to check out books that will teach her about building houses. The boys laugh as if it is the most ridiculous idea they have ever heard!

Despite Cherubino and Don Giovanni's doubts, they follow Despina as she makes her way through the woods to the library, where Wolfgang Bigbad himself is pacing back and forth in front of the building. He hasn't eaten all day and would love to get his paws on a small pig, or better yet, two or three! When he sees the three little pigs, he "hides" himself by pretending to be a statue in order to surprise them. Despina goes directly into the library while the boys play outside. Soon they realize that the "statue" is really Wolfgang Bigbad! Cherubino sees that Don Giovanni is terrified, and makes him approach the "statue" to invite him to dinner. The "statue" (Wolfgang) nods his head to accept the invitation.

Meanwhile, Despina has found all of the books she needs, and the three pigs prepare to build their houses. Don Giovanni has built his house of sticks, which Wolfgang blows down. Cherubino has gone ahead with his plans to build a straw house, but it proves to be even less "huff-proof, puff-proof" than his brother's because Wolfgang blows it down, too! Now that both of the boys' flimsy homes are gone, they run to the safety of Despina's house, which she has made of bricks. Wolfgang, now very, very hungry, cannot blow it down! He tries every trick he can think of to get into Despina's sturdy home, but it is no use!

In the end, after their scary, hair-raising encounter with Wolfgang, Cherubino and Don Giovanni both wholeheartedly agree that Despina's idea of going to the library and reading books is a pretty smart thing to do after all.

The Characters

Despina: (soprano or mezzo) A little girl pig who loves the library.

Cherubino: (mezzo or tenor) Despina's older brother.

Don Giovanni: (bass or baritone) Despina's younger brother.

Wolfgang Big Bad: (bass or baritone) The Big Bad Wolf, himself.

GLOSSARY OF TERMS

Rough Stake – An outline of the building site, used with ropes and stakes in the ground.

Clearing – The removal of trees, vegetation, or other obstructions from an area of land.

Grading – The act of altering the ground surface to a desired grade or contour by cutting, filling, leveling, and/or smoothing.

Hauling – The transport of any and all debris made from Clearing and Grading.

Fill Dirt – The soil or other material used to raise the grade of a site area.

Preparation Land Survey – A survey to determine the boundaries of your property. The cost depends on the complexity of the survey.

Footings – The portion of the foundation of a structure that spreads and transmits the load directly to the soil.

Layout, Dig, Pour – The outline of where the foundations will go, the excavation of the earth to prepare for the foundations, and pouring of concrete for foundations.

Steel – Any number of alloys of iron and carbon, with small amounts of other metals added to achieve special properties. The alloys are generally strong, hard, durable and malleable.

Concrete – A composite material consisting of sand, coarse aggregate (gravel, stone, or slag), cement, and water. When mixed and allowed to harden, it forms a stone-like material.

Drains – A pipe, ditch, or trench designed to carry away waste water.

Brick – A solid masonry unit of clay or shale, formed into a rectangular prism while plastic, and then burned or fired in a kiln.

Mortar – A plastic mixture used in masonry construction that can be troweled and hardens in place.

Vents – A pipe built into a drainage system to provide air circulation, thus preventing siphonage and back pressure from affecting the function of the trap seals.

Dampproofing – An application of a water-resisting treatment or material to the surface of a concrete or masonry wall to prevent passage or absorption of water or moisture.

Foundation Survey – After the foundation walls are poured for a structure being built, the Foundation Survey is conducted to measure the dimensions, location and elevation to ensure that it has been poured within specifications before building can resume.

Name: _____ Date: _____

Cost Analysis Chart

Instructions: You are rebuilding your house from the tornado that touched down in your city. You will use the information in the chart to fill in the blanks and calculate your estimated expenses to complete the restoration of your home. After you have completed the chart, use the information to answer the questions that follow.

SITE PREPARATION	Quantity	Price	Unit	Labor	Total
Rough Stake	1	\$175.00	Lump Sum	\$213.00	
Clearing, Grading , Hauling	8	\$137.00	Per Hour	\$740.00	
Fill Dirt	5	\$90.00	Per Load		
Preparation Land Survey	1	\$289.00	Lump Sum	\$125.00	
Total Site Prep:					

FOOTINGS	Quantity	Price	Unit	Labor	Total
Layout, Dig and Pour	312	\$1.27	Per Area	\$473.00	
Steel	62	\$4.97	Each		
Concrete	12	\$130.00	Per Cycle		
Drains	9	\$237.00	Each		
Total Footings:					

FOOTINGS	Quantity	Price	Unit	Labor	Total
Concrete	26	\$130.00	Per Cycle		
Brick	6	\$37.00	Per Load		
Mortar	4	\$12.49	Per Pack		
Sand	3	\$79.00	Per Cycle		
Steel	108	\$6.27	Each		
Vents	5	\$379.00	Each	\$75.00	
Damp Proofing	1	\$275.00	Lump Sum	\$115.00	
Foundation Survey	1	\$562.00	Lump Sum	\$150.00	
Total Foundations:					
Total for all Expenses:					

Name: _____ Date: _____

Activity Worksheet

1. How much is the total price for labor? _____

2. What is the total price for each section of expenses below?
 - a. Site Preparation: _____
 - b. Footings: _____
 - c. Foundations: _____
 - d. All Expenses: _____

3. What is the total expense for the "Preparation Land Survey"?
 - a. Written Form: _____
 - b. Expanded Form: _____

Picture Form:

4. How much are your Total Expenses if labor was not included?

5. What is the total of all "Lump Sum" items? _____

6. If too little Steel and Concrete were purchased for the "Foundations" section, and "Foundation Survey" was not included, what would the new total be for the "Total Foundations" using the following information?
Concrete = 19, Steel = 89
New Total Foundations = _____

ANSWER KEY

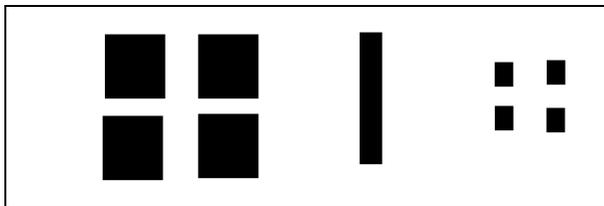
Activity Worksheet

SITE PREPARATION	Quantity	Price	Unit	Labor	Total
Rough Stake	1	\$175.00	Lump Sum	\$213.00	\$388.00
Clearing, Grading , Hauling	8	\$137.00	Per Hour	\$740.00	\$1,836.00
Fill Dirt	5	\$90.00	Per Load		\$450.00
Preparation Land Survey	1	\$289.00	Lump Sum	\$125.00	\$414.00
Total Site Prep:					\$3,088.00

FOOTINGS	Quantity	Price	Unit	Labor	Total
Layout, Dig and Pour	312	\$1.27	Per Area	\$473.00	\$869.24
Steel	62	\$4.97	Each		\$308.14
Concrete	12	\$130.00	Per Cycle		\$1,560.00
Drains	9	\$237.00	Each		\$2,133.00
Total Footings:					\$4,870.38

FOOTINGS	Quantity	Price	Unit	Labor	Total
Concrete	26	\$130.00	Per Cycle		\$3,380.00
Brick	6	\$37.00	Per Load		\$222.00
Mortar	4	\$12.49	Per Pack		\$49.96
Sand	3	\$79.00	Per Cycle		\$237.00
Steel	108	\$6.27	Each		\$677.16
Vents	5	\$379.00	Each	\$75.00	\$1,970.00
Damp Proofing	1	\$275.00	Lump Sum	\$115.00	\$390.00
Foundation Survey	1	\$562.00	Lump Sum	\$150.00	\$712.00
Total Foundations:					\$7,638.12
Total for all Expenses:					\$15,596.50

1. \$1,891.00
2. a. \$3,088.00
 b. \$4,870.38
 c. \$7,638.12
 d. \$15,596.50
3. a. 414.00
 b. 400 +10 +4



4. \$13,705.50
5. \$1,904.00
6. \$6,608.99