

THE THREE LITTLE PIGS

music by W.A. MOZART adapted by JOHN DAVIES

SCIENCE: “Making Bricks”

Students will

- Read “The Story of the Opera”
- Discuss the pros and cons of the building materials from the story
- Make adobe bricks
- Test the heat retention of adobe brick
- Record their findings on a chart

Copies for each student: “The Story of the Opera”, “The Characters”, Activity Worksheet 1&2

Copies for the Teacher: “The Story of the Opera”, “The Characters”

Getting Ready

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

Gather materials:

- Extra Paper and pencils
- Soil
- Water
- Large bowls
- Straw, dry grass, or pine needles
- 2 Thermometers per student or group
- One-pint milk cartons
- Timer
- Sunny window

Instructional Time: 2 classes

****NOTE****

This activity takes several days to a week to complete due to the time it takes to dry and cure the brick.

Introduction

Have students read “The Story of the Opera”. Discuss the different types of houses Cherubino, Don Giovanni, and Despina built. Discuss the pros and cons of straw, sticks, and bricks as building materials.

Some questions you may ask are:

- Why do you think straw house didn’t work?
- Why do you think the stick house still didn’t work?
- Could a straw house be a good idea? Why? Where?
- Why did the brick house work?

Tell students “Despina’s house was made of brick, which we know is the strongest material in the story. There are actually different types of bricks that people use when building homes and buildings. One of the oldest type

of bricks is the adobe brick. It is a common building material in many parts of the world, including the southwestern United States, Mexico, parts of Europe, and even in Asia, where there are not many trees. These adobe bricks are made by combining mud with straw or dry grass, and drying them in the sun. You can even find adobe bricks in the Great Wall of China and in the Alamo here in Texas! Ask students to think of the pros and cons of using adobe.”

Tell students that they will be making their own adobe bricks. Students will then test the ability of adobe to retain the heat of the sun. Explain that a building material which retains heat can keep a home warm in the winter and cool in the summer, and the ability of adobe to retain heat and cooler temperatures was essential in the times before central heating and air conditioning. Then ask students to predict how long the brick will hold the heat from the sun, and have them record their hypotheses on the Activity Worksheet.

Guided/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 directions on the Activity Worksheet. Provide instruction and model the activity as needed. Have students complete the portion(s) of the Activity Worksheet you have chosen with opportunity for questions.

Evaluation:

Ask the class if their hypotheses at the beginning of the experiment were correct, and discuss their findings. Some questions that can be asked are:

- What happened to the temperature inside the brick as time went by?
- Was our hypothesis correct?
- What are some advantages to using adobe bricks to build a house
- What can be added to the mud to make it stronger?
- What would happen to our brick if it froze and thawed a lot?
- What if it got wet a lot?

Prove it!

The Dallas Opera wants to see your hard work! Take pictures, or videos, of your class’s work and email them to: education@dallasopera.org for a chance to be featured on The Dallas Opera Website (<http://dallasopera.org/learn/>) and/or at the pre-show for the Student Matinees™!

TEKS – Science

3rd Grade

112.14 b. 1 A Scientific investigation and reasoning

The student conducts classroom and outdoor investigations following school and home safety procedures and environmentally appropriate practices. The student is expected to: (A) demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including observing a schoolyard habitat

112.14 b. 2 B,D Scientific investigation and reasoning

The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to: (B) collect data by observing and measuring using the metric system and recognize differences between observed and measured data; (D) analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations

112.14 b. 6 A Force, motion and energy

The student knows that forces cause change and that energy exists in many forms. The student is expected to: (A) explore different forms of energy, including mechanical, light, sound, and heat/thermal in everyday life

4th Grade

112.15 b. 1 A Scientific investigation and reasoning

The student conducts classroom and outdoor investigations following school and home safety procedures and environmentally appropriate practices. The student is expected to: (A) demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including observing a schoolyard habitat

112.14 b. 2 D Scientific investigation and reasoning

The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to: (D) analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured

Correlates: Language Arts

Gardner's Intelligences: Linguistic, Logical-Mathematical

Bloom's Taxonomy: Understand, Analyze, Evaluate

Sources:

Online Resources:

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

<http://www.heifer.org/readtofeed/resources/support-materials/read-to-feed-3-4-lesson-9.html> (accessed on 3/8/2016)

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.

Name: _____

Date: _____

Activity Worksheet 1: Making Adobe Bricks

Part I: Instructions for Brick Making:

1. Put the straw, soil, and water into a large bowl and mix it well. The amounts are not exact, but the mixture should be stiff and thick.
2. Open the top of the empty one-pint milk carton. Pour the mud mixture from the bowl into the milk carton.
3. Make a hole in the mud by pushing a pencil halfway down the middle of the opening. Loosen the mud around the pencil by moving the pencil in a small circle, and then leave it in the carton.
4. Place the milk cartons in a sunny window and leave them there for several days to dry.

Question: How long will adobe bricks retain (hold) the sun's heat after absorbing it for an hour?

Hypothesis (Answer):

Part II: Instructions for Temperature Experiment:

1. When the bricks are firm and dry, take the pencil out and peel off the carton.
2. Leave the bricks in a sunny window for one more hour. Then put the brick on a table out of the sun.
3. Put a thermometer in the hold of the brick. This will measure the temperature inside the brick.
4. Place another thermometer nearby on the table to measure the temperature outside of the brick.
5. Record the temperatures in the "Data Chart" on Activity Worksheet 2, and note whether the temperature inside the brick is greater than, less than, or equal to the temperature outside the brick.
6. Wait ten minutes and record the temperatures on the "Data Chart", and note whether the temperature inside the brick is greater than, less than, or equal to the temperature outside the brick.
7. Repeat every ten minutes until the temperatures are the same.

