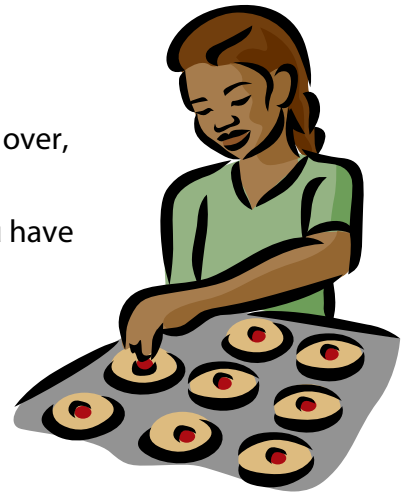
Share the Cookies



Background: In *The Doorbell Rang* by Pat Hutchins, Grandma brings cookies to Sam and Victoria. As friends come over, they want to share the cookies equally.

Design Challenge: Design and build a container for each friend's cookies. You will be told how many cookies you have in all and the number of friends you will share with. You must share the cookies equally.

Criteria: You must

- ☐ decide how many cookies are in each equal set
- ☐ build containers to hold each set.

Materials: Select from the list below.		**Tools:** Select from the list below.
• cardboard • cardstock • cookie pattern • paper clips • paper tubes	• pipe cleaners • plastic lids • scrap paper • tape (6-inch piece per container)	• markers/crayons • pencils • ruler • scissors

Targeted Standard of Learning: Mathematics 1.3
Supporting SOL: History and Social Science 1.10

Targeted Standard for Technological Literacy: 10
Supporting STL: 8, 9, 11

Tips for Teachers

Targeted Standards of Learning:

Mathematics 1.3 The student will identify the parts of a set and/or region that represent fractions for halves, thirds, and fourths and write the fractions.

Supporting SOL: History and Social Science 1.10

Targeted Standards for Technological Literacy:

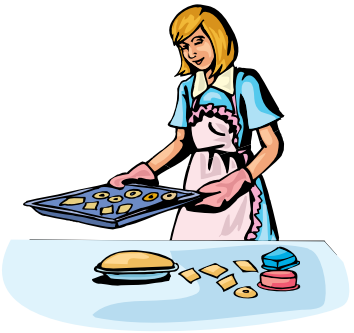
10 Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Supporting STL: 8, 9, 11

Prior Knowledge & Skill	Materials & Preparation	Safety Issues	Class Management	Materials Provided	Design Process
• Pat Hutchins's book *The Doorbell Rang* • Mathematics vocabulary: *sets*, *subsets*, *fractions*, *half*, *third*, *fourth*, *whole*, *part*	• Check Design Brief for recommended materials. • Plastic lids could be used to represent cookies.	• Use of scissors	• Partners or groups	• Design Brief • Guided Portfolio (adapt as appropriate/ optional) • Rubric Assessments	Follow the Design Process: • Restate the problem. • Brainstorm solutions. • Create the best solution. • Test the solution. • Evaluate the solution.

Extension Ideas: Use the fractional terms *half*, *third*, and *fourth* to direct students to practice dividing their total number of cookies into the fractional parts.

Guided Portfolio



Name _____

Group Members _____

1. What is the problem? State the problem in your own words.

Guided Portfolio, p2

Name _____

2. Brainstorm solutions. Sketch and/or describe some possible solutions.

Name _____

3. Create the solution you think is best.

Keep notes about your problems and how you solve them. Make sketches if they help.

_____

_____

_____

_____

Name _____

4. Test your solution.

How many cookies did you start with? _____

How many friends came to visit? _____

How many cookies did you put in each set? _____

My cookies are divided into halves thirds fourths. (Circle one.)

Do your containers hold the cookies? YES NO

Name _____

5. Evaluate your solution.

Was it the best solution? Why or why not?

_____

_____

_____

What would you have done differently? Why?

_____

_____

_____

Rubric for Share the Cookies

Name _____ Date _____

0—no evidence; 1—limited understanding; 2—some understanding with room for improvement; 3—good understanding with room for improvement; 4—substantial understanding

Student Evaluation	**0**	**1**	**2**	**3**	**4**
Oral Presentation: The student					
• used complete sentences					
• used descriptive words.					
Guided Portfolio: The student participated in					
• restating the problem					
• brainstorming solutions					
• creating a solution					
• testing the solution					
• evaluating the solution.					
Team Skills: The student					
• used appropriate voice					
• encouraged team members					
• listened to team members					
• was involved in all aspects of the project					
• respected team members.					

Tested Criteria	YES	NO
The student demonstrated the concept of evenly dividing a set of objects.		
The student built containers that hold each set of cookies.		

Standards of Learning

History and Social Science (2008)

Civics

1.10 The student will apply the traits of a good citizen by

a) focusing on fair play, exhibiting good sportsmanship, helping others, and treating others with respect;
b) recognizing the purpose of rules and practicing self-control;
c) working hard in school;
d) taking responsibility for one's own actions;
e) valuing honesty and truthfulness in oneself and others;
f) participating in classroom decision making through voting.

Mathematics (2009)

Number and Number Sense

Mathematics 1.3 The student will identify the parts of a set and/or region that represent fractions for halves, thirds, and fourths and write the fractions.

Standards for Technological Literacy

Standard 8: Students will develop an understanding of the attributes of design.

Standard 9: Students will develop an understanding of engineering design.

Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Standard 11: Students will develop the abilities to apply the design process.

Please give us some feedback.

Complete the form below to let us know how this design brief worked for you and your students. Please be specific so that we might use your suggestions to improve the activity. *You can fill this out on your computer, or you can print it, fill it out manually, and scan it.*

Teacher: _____

School: _____

School division: _____

Design brief title: _____

Background *Put an X in the appropriate column:*	Needs to be rewritten	Needs minor adjustment	Is ready for classroom use
Does it set the context for the activity?			
Is it age-appropriate in language, length, and complexity?			
Does it reference prior learning and/or research that the students did that will facilitate designing a solution to a problem?			
Is it detailed enough that an adult will understand the purpose for the design brief?			
COMMENTS. *If any of the questions above are marked other than "ready for classroom use," please provide suggestions here.*			

Design Challenge	Needs to be rewritten	Needs minor adjustment	Is ready for classroom use
Does the challenge support your curriculum?			
Is it age-appropriate in language, length, and complexity?			
Is it detailed enough that an adult will understand the purpose for the design brief?			
COMMENTS. *If any of the questions above are marked other than "ready for classroom use," please provide suggestions here.*			

Criteria Criteria are part of the challenge. They set the limitations for the design. They are not directions.	Needs to be rewritten	Needs minor adjustment	Is ready for classroom use	N/A
Are the limitations age-appropriate?				
Do the limitations encourage critical thinking?				
Is the application of mathematic knowledge/skills integrated into the criteria? If not, should the skill area be addressed?				
Is the application of science knowledge/skills integrated into the criteria? If not, should the skill area be addressed?				
Is the application of social studies knowledge/skills integrated into the criteria? If not, should the skill area be addressed?				
Are language skills integrated into the criteria? If not, should the skill area be addressed?				
COMMENTS. *If any of the questions above are marked other than "ready for classroom use," please provide suggestions here.*				

Materials Materials help set the limitations for the design. The list should include materials that might work.	Needs to be rewritten	Needs minor adjustment	Is ready for classroom use	N/A
Does the materials list encourage a variety of design solutions?				
Does the materials list include a variety of choices for joining items?				
Does the materials list include materials that force students to make decisions?				
COMMENTS. *If any of the questions above are marked other than "ready for classroom use," please provide suggestions here.*				

Tools Tools can be used in the construction of the designed product. They are used to manipulate materials. They cannot become part of the product.	Needs to be rewritten	Needs minor adjustment	Is ready for classroom use
Are the tools listed age appropriate?			
Are all tools needed for the activity included?			
COMMENTS. *If any of the questions above are marked other than "ready for classroom use," please provide suggestions here.*			

Standards of Learning	Yes	No
Does the design brief reinforce the targeted Standard of Learning(s)?		
Are the supporting Standards of Learning appropriate?		
What Standards of Learning would you add or remove?		

Standards for Technological Literacy	Yes	No
Does the design brief reinforce the targeted Standard(s) for Technological Literacy?		
Are the supporting Standards for Technological Literacy appropriate?		
What Standards for Technological Literacy would you add or remove?		

Tips for Teachers	Yes	No
Are the tips listed in the chart helpful for a first-time teacher?		
What tips would you add?		

Guided Portfolio	Needs to be rewritten	Needs minor adjustment	Is ready for classroom use
Are the instructions and questions age appropriate and clear?			
In the "Test your solution" section, do the questions force students to thoroughly test their solutions?			
In the "Evaluate your solution" section, do the questions force students to honestly evaluate their solutions			
COMMENTS. *If any of the questions above are marked other than "ready for classroom use," please provide suggestions here.*			

Additional Comments Please use this area to provide general suggestions for improving this design brief.