Give Me Five

Background: We have been discussing the different ways to represent numbers.

Design Challenge: Design and create a containing structure to hold five different ways to represent a given number.

Criteria:

☐ You must build a containing structure.

☐ Your structure must contain five ways to represent your assigned number.

☐ You must include a fact family with your assigned number as the total. You will be asked to model this with your materials during sharing.

Materials: Select from the list below.		**Tools:** Select from the list below.
- beans - bottle caps - buttons - cardboard - cardstock - construction paper - foil	- glue - pipe cleaners - recyclables - straws - tape (12 inches) - toothpicks - yarn or string	- markers/crayons - ruler - scissors

Targeted Standards of Learning: Mathematics 1.1, 1.2

Supporting SOL: English 1.1, 1.3; Mathematics 1.5, 1.7, 1.14; History and Social Science 1.10

Targeted Standard for Technological Literacy: 8

Supporting STL: 11, 17

Tips for Teachers

Targeted Standards of Learning:

Mathematics 1.1   The student will
- a) count from 0 to 100 and write the corresponding numerals; and
- b) group a collection of up to 100 objects into tens and ones and write the corresponding numeral to develop an understanding of place value.

Mathematics 1.2   The student will count forward by ones, twos, fives, and tens to 100 and backward by ones from 30.

Supporting SOL: English 1.1, 1.3; Mathematics 1.5, 1.7, 1.14; History and Social Science 1.10

Targeted Standard for Technological Literacy:

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

Supporting STL: 11, 17

Prior Knowledge & Skill	Materials & Preparation	Safety Issues	Class Management	Materials Provided	Design Process
• Number sense	• See Design Brief for recommended materials.	• Use of scissors and other tools and materials correctly	• Individual or partner work	• Design Brief • Guided Portfolio (adapt as appropriate/ optional) • Rubric Assessments	Follow the design process: • Restate the problem • Brainstorm solutions • Create the solution • Test the solution • Evaluate the solution

Guided Portfolio

Name _____

Group Members _____

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

_____

_____

_____

_____

_____

_____

_____
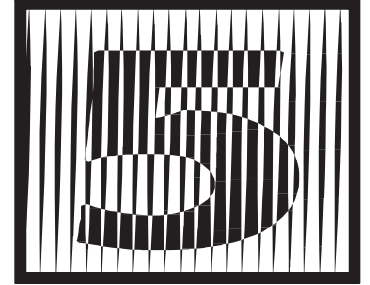
Name _____

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.

What was your assigned number? _____

How many ways did you show your number?   _____

Did you include a fact family for your number?   YES   NO

Did you design and create a containing structure?   YES   NO

Name   _____

5.   Evaluate your solution.

Was it the best solution? Why or why not?

_____

_____

_____

What would you have done differently?

_____

_____

_____

Rubric for Give Me Five

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 container included at least five ways to represent the assigned number.		
The student designed and created a containing structure.		
The student included a fact family for the number.		

Standards of Learning

English (2010)

Oral Language

1.1   The student will continue to demonstrate growth in the use of oral language.
a) Listen and respond to a variety of electronic media and other age-appropriate materials.
b) Tell and retell stories and events in logical order.
c) Participate in a variety of oral language activities, including choral speaking and reciting short poems, rhymes, songs, and stories with repeated patterns.
d) Participate in creative dramatics.
e) Express ideas orally in complete sentences.

1.3   The student will adapt or change oral language to fit the situation.
a) Initiate conversation with peers and adults.
b) Follow rules for conversation using appropriate voice level in small-group settings.
c) Ask and respond to questions.
d) Follow simple two-step oral directions.
e) Give simple two-step oral directions.

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

1.1   The student will
a) count from 0 to 100 and write the corresponding numerals; and
b) group a collection of up to 100 objects into tens and ones and write the corresponding numeral to develop an understanding of place value.

1.2   The student will count forward by ones, twos, fives, and tens to 100 and backward by ones from 30.

Computation and Estimation
1.5   The student will recall basic addition facts with sums to 18 or less and the corresponding subtraction facts.

Measurement
1.7   The student will
        a) identify the number of pennies equivalent to a nickel, a dime, and a quarter; and
        b) determine the value of a collection of pennies, nickels, and dimes whose total value is 100 cents or less.

Probability and Statistics
1.14   The student will investigate, identify, and describe various forms of data collection (e.g., recording daily temperature, lunch count, attendance, favorite ice cream), using tables, picture graphs, and object graphs.

Standards for Technological Literacy

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

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

Standard 17:   Students will develop an understanding of and be able to select and use information and communication technologies.

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.