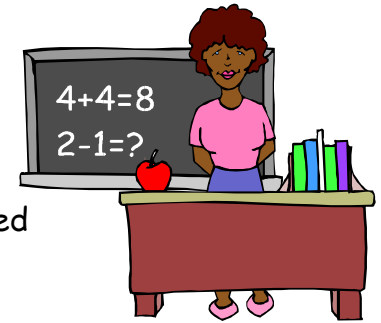


Math Fact Family Map



Background: We have explored even and odd numbers by looking for them in our environment. We looked on a map and we saw that our houses are numbered.

Design Challenge: Complete the fact family house. The windows are your addend numbers and the door is the sum. Figure the fact family number sentences on the roof. The sum is the house number for your map. Arrange your fact family homes to create a neighborhood map, using what you know about number patterns and maps. You will share your maps with the class.

Criteria:

Each map must have

- fact family completed on roof
- a map key
- a compass rose
- house numbers that follow a pattern on the map.

Materials: You may select from the items below.

- bulletin board paper (2 yards long)
- markers
- construction paper
- crayons
- scissors
- glue
- paper tubes
- rulers
- yarn

Targeted Standard of Learning: Mathematics 1.8
Supporting Standards of Learning: Mathematics 1.4, 1.5, 1.15, 1.21
History and Social Science 1.4b, 1.5
Science 1.1c
English 1.1, 1.2, 1.3, 1.12

Targeted Standards for Technological Literacy: 2, 9
Supporting Standards for Technological Literacy: 3, 8, 12, 18

Math Fact Family Map

$$\begin{array}{r}
 2 \\
 + 2 \\
 \hline
 4
 \end{array}$$

Targeted Standard of Learning: Mathematics 1.8

- The student will recall basic addition facts — i.e., sums to 10 or less — and the corresponding subtraction facts.

Targeted Standards for Technological Literacy: Standard 2, Standard 9

- Students will develop an understanding of the core concepts of technology.
- Students will develop an understanding of engineering design.

Prior Knowledge & Skills	Materials & Preparation	Safety Issues	Class Management	Materials Provided	Time Management
<ul style="list-style-type: none"> • Fact family • Even/odd number pattern as in house numbering • Maps • Map key defined • Compass rose 	<ul style="list-style-type: none"> • Check Design Brief for recommended materials. Teacher may substitute materials. 	<ul style="list-style-type: none"> • Use of scissors 	<ul style="list-style-type: none"> • Groups of three to four • Can be an individual project 	<ul style="list-style-type: none"> • Design Brief • Guided Portfolio (optional use) • Fact Family Template • Rubric • Assessment 	<ul style="list-style-type: none"> • Session 1: Introducing Design Brief (20 min.) • Sessions 2 and 3: Building (30 min.) • Session 4: Sharing and evaluating • Additional sessions may be added if maps are to be detailed.

Fact Family House

A house-shaped template for a fact family. The roof is a trapezoid with a dashed line for a fold. The main body is a trapezoid containing four math problems:

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$
$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$
$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$
$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

The base of the house is a rectangle containing two base ten blocks (each with a vertical column of 10 units and a horizontal row of 10 units) and a window with a triangular roof and a square opening.

A house-shaped template for a fact family, identical to the one on the left. The roof is a trapezoid with a dashed line for a fold. The main body is a trapezoid containing four math problems:

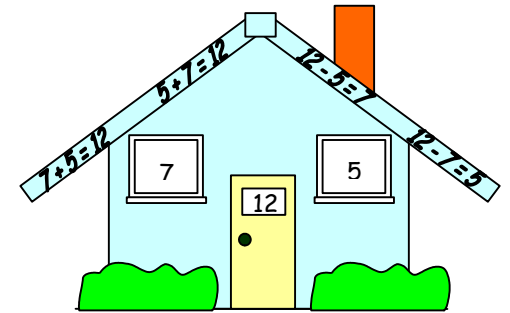
$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$
$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$
$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$
$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

The base of the house is a rectangle containing two base ten blocks (each with a vertical column of 10 units and a horizontal row of 10 units) and a window with a triangular roof and a square opening.

Guided Portfolio—1

Name _____

Math Fact Family Map



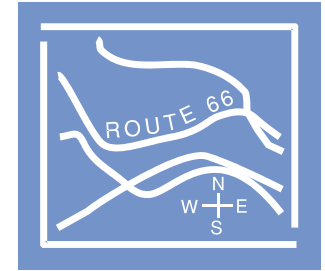
Group Members: _____

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

Targeted Standard of Learning: Mathematics 1.8
Supporting Standards of Learning: Mathematics 1.4, 1.5, 1.15, 1.21
History and Social Science 1.4b, 1.5
Science 1.1c
English 1.1, 1.2, 1.3, 1.12

Targeted Standard for Technological Literacy: 2, 9
Supporting Standards for Technological Literacy: 3, 8, 12, 18

Name _____



2. Brainstorm solutions.

Draw or describe some possible solutions.

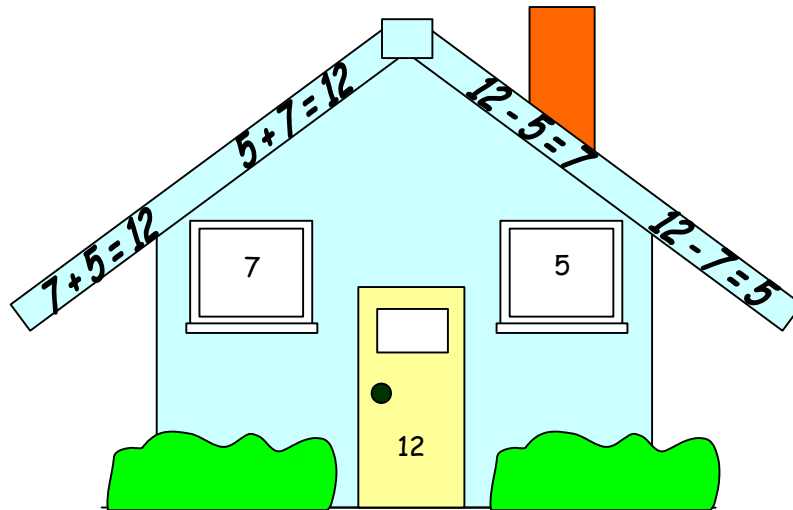
A brainstorming template consisting of four large, rounded rectangular boxes arranged in a 2x2 grid. In the center of the grid, where the four boxes meet, is a simple line drawing of a lit lightbulb. The lightbulb has several short lines radiating from its top half, indicating it is glowing. The boxes are empty, intended for drawing or describing solutions.

Name _____

4. Test your solution.

• Are your numbers odd on one side of the street and even on the other? YES NO

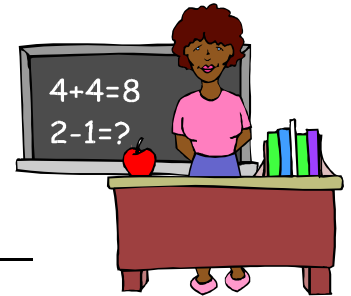
• Can you count $\frac{20}{21} \quad \frac{22}{23} \quad \frac{24}{23}$ or a similar sequence? YES NO



Name _____

5. Evaluate your solution.

Was it the best solution? Would one of your other ideas have been better? Why or why not?



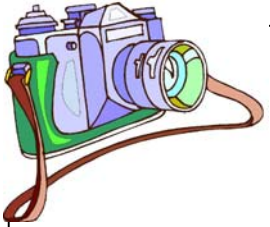
What would you have done differently?

Could you add to it to make it better? What would you add to it?

Guided Portfolio—6

Name _____

Attach a photograph of your final project here. If you do not have a photograph, draw a picture of your final project.



How would you make your project better? Draw a picture showing how it would look after you have made changes to it.



Rubric for *Math Fact Family Map*

Name _____

Date _____

Student Evaluation	no evidence 0	limited understanding 1	some understanding with room for improvement 2	good understanding with room for improvement 3	substantial understanding 4
Oral Presentation: The student <ul style="list-style-type: none"> used complete sentences used plural and singular nouns. 					
Guided Portfolio: The student <ul style="list-style-type: none"> restated the problem brainstormed solutions created a solution tested the solution evaluated the solution. 					
Team Skills: The student <ul style="list-style-type: none"> used appropriate voice encouraged team members listened to team members was involved in all aspects of the project respected team members. 					

Tested Criteria		
The fact family was completed correctly.	Yes	No
The house numbers followed a pattern.	Yes	No
The map had a compass rose.	Yes	No
The map had a legend or map key.	Yes	No



Standards of Learning

English (2002)

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 media, including books, audiotapes, videos, 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) Express ideas orally in complete sentences.
- 1.2 The student will continue to expand and use listening and speaking vocabularies.
 - a) Increase oral descriptive vocabulary.
 - b) Begin to ask for clarification and explanation of words and ideas.
 - c) Follow simple two-step oral directions.
 - d) Give simple two-step oral directions.
 - e) Use singular and plural nouns.
- 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.
 - c) Use appropriate voice level in small-group settings.
 - d) Ask and respond to questions in small-group settings.

Writing

- 1.12 The student will write to communicate ideas.
 - a) Generate ideas.
 - b) Focus on one topic.
 - c) Use descriptive words when writing about people, places, things, and events.
 - d) Use complete sentences in final copies.
 - e) Begin each sentence with a capital letter and use ending punctuation in final copies.
 - f) Use correct spelling for frequently used words and phonetically regular words in final copies.
 - g) Share writing with others.
 - h) Use available technology.

Science (2003)

Scientific Investigation, Reasoning, and Logic

- 1.1 The student will conduct investigations in which
- differences in physical properties are observed using the senses;
 - simple tools are used to enhance observations
 - objects or events are classified and arranged according to attributes or properties;
 - observations and data are communicated orally and with simple graphs, pictures, written statements, and numbers;
 - length, mass, and volume are measured using standard and nonstandard units;
 - predictions are based on patterns of observation rather than random guesses;
 - simple experiments are conducted to answer questions;
 - inferences are made and conclusions are drawn about familiar objects and events.

Mathematics (2001)

Number and Number Sense

- 1.4 The student will recognize and write numerals 0 through 100.
- 1.5 The student will identify the ordinal positions first through tenth, using an ordered set of objects.

Computation and Estimation

- 1.8 The student will recall basic addition facts - i.e., sums to 10 or less - and the corresponding subtraction facts.

Geometry

- 1.15 The student will describe the proximity of objects in space (near, far, close by, below, above, up, down, beside, and next to).

Patterns, Functions, and Algebra

- 1.21 The student will recognize, describe, extend, and create a wide variety of patterns, including rhythmic, color, shape, and numerical. Patterns will include both growing and repeating patterns. Concrete materials and calculators will be used by students.

History and Social Science (2001)

Geography

- 1.4 The student will develop map skills by
- recognizing basic map symbols, including references to land, water, cities, and roads;
 - using cardinal directions on maps;
 - identifying the physical shape of the United States and Virginia on maps and globes;
 - locating Washington, D.C., the capital of the United States, and Richmond, the capital of Virginia, on a United States map.
- 1.5 The student will construct a simple map of a familiar area, using basic map symbols in the map legend.

Standards for Technological Literacy

Standard 2: Students will develop an understanding of the core concepts of technology.

Standard 3: Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.

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

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

Standard 12: Students will develop the abilities to use and maintain technological products and systems.

Standard 18: Students will develop an understanding of and be able to select and use transportation technologies.