**Multiplication and Division Problem Situations**

1. Solve each problem by direct modeling and write an equation(s) to represent each problem.
   - Grandma gives 4 cookies to each of her 3 grandchildren. How many cookies are there?
   - Grandma shares 12 cookies among her 3 grandchildren. How many cookies does each grandchild get?
   - Grandma has 12 cookies and gives 3 to each grandchild. How many grandchildren are there?

2. What are the similarities and differences among the three word problems?

3. Complete the first four columns of the table below. If a quantity is not explicitly stated in the problem write 'unknown'. Complete column 5 by classifying each problem according to the problem situations described in Table 2 on page 93 of *Iowa Core Mathematics*. Explain your reasoning.

| Word Problem | Number of Groups | Size of Group | Total | Possible Equation(s) | Problem Type |
|---|---|---|---|---|---|
| Grandma gives 4 cookies to each of her 3 grandchildren. How many cookies are there? | | | | | |
| Grandma shares 12 cookies among her 3 grandchildren. How many cookies does each grandchild get? | | | | | |
| Grandma has 12 cookies and gives 3 to each grandchild. How many grandchildren are there? | | | | | |

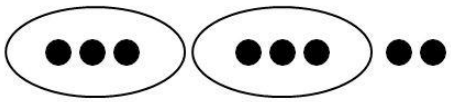
Adapted from: Empson, S. B. and Levi, L. (2011). *Extending Children's Mathematics: Fractions & Decimals, Innovations in Cognitively Guided Instruction.* Portsmouth, NH: Heinemann.

4. Which problem type is the Brownie problem? Explain your reasoning.

**Challenge Problem – Optional homework**

The following diagrams each represent a solution to a one-step division word problem with a whole-number remainder. Write a word problem to match each diagram and an equation to represent the problem. Classify each problem as partitive or measurement division. Describe how you know from the diagram which problem represents partitive division and which problem represents measurement division.

Diagram:

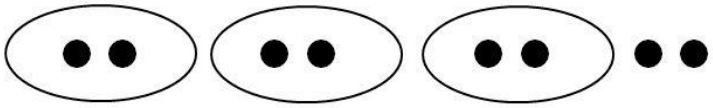


Word Problem:

Problem Type:
Reasoning:

Equation(s):

Diagram:



Word Problem:

Problem Type:
Reasoning:

Equation(s):