

# Comparing Money Raised

Sample task from [achievethecore.org](http://achievethecore.org)

Task by Illustrative Mathematics, annotation by Student Achievement Partners

GRADE LEVEL Fourth

IN THE STANDARDS 4.OA.A.2

WHAT WE LIKE ABOUT THIS TASK

Mathematically:

- Highlights multiplicative comparison, an important development in multiplicative thinking beginning in grade 4 (4.OA.A.1, 4.OA.A.2).
- Builds meaning for multiplication equations through word problems (4.OA.A); shows how a multiplication equation models a situation (MP4).
- Uses the same fact family in parts (b) and (c) to highlight different roles of the unknown factors.




In the classroom:

- Provides a context that can be acted out in an engaging way.
- Allows opportunity for presentation/demonstration of student work (e.g. poster presentation with number strips).

This task was designed to include specific features that support access for all students and align to best practice for English Language Learner (ELL) instruction. Go [here](#) to learn more about the research behind these supports. This lesson aligns to ELL best practice in the following ways:

- Provides opportunities for students to practice and refine their use of mathematical language.
- Allows for whole class, small group, and paired discussion for the purpose of practicing with mathematical concepts and language.
- Includes a mathematical routine that reflects best practices to supporting ELLs in accessing mathematical concepts.
- Provides students with support in negotiating written word problems through multiple reads and/or multi-modal interactions with the problem.

## MAKING THE SHIFTS<sup>1</sup>

	Focus	Belongs to the Major Work <sup>2</sup> of fourth grade
	Coherence	Builds on previous understanding of multiplication as equal groups to multiplication as times-as-much.
	Rigor <sup>3</sup>	Conceptual Understanding: primary in this task Procedural Skill and Fluency: not targeted in this task Application: primary in this task

<sup>1</sup>For more information read [Shifts for Mathematics](#).

<sup>2</sup>For more information, see [Focus in Grade Four](#).

<sup>3</sup>Tasks will often target only one aspect of rigor.

## INSTRUCTIONAL ROUTINE

*The steps in this routine are adapted from the [Principles for the Design of Mathematics Curricula: Promoting Language and Content Development](#).*

Engage the students in the [Information Gap Mathematical Language Routine](#) by giving partners or team members different pieces of information that must be used together to solve a problem. Students orally share their ideas, questions, and information. Model for the students how to ask for and share information and how to ask clarifying questions.

Partner A has the general problem on a card, and Partner B has the information needed to solve it on the "data card." Partner A needs to realize what is needed and ask for information that is provided on Partner B's data card. Partner B should not share information unless Partner A specifically asks for it. Neither partner should read their cards to one another nor show their cards to their partners. Partner B should not do any calculations in order to provide data to Partner A. As they work the problem, they justify their responses using clear and connected language. Students should engage with all three sets of cards.

1. READ, then THINK-ALoud: The problem card partner (Partner A) reads his or her card silently and thinks aloud about what information is needed.  
Partner B reads the data card silently and thinks about the problem they are trying to solve.
2. QUESTION 1: Partner B asks, "What specific information do you need?"  
Partner A needs to ask for specific information from Partner B.
3. QUESTION 2: When partner A asks, Partner B should ask for justification: "Why do you need that information?" before telling it to Partner A.
4. EXPLANATIONS: Partner A then explains how he or she is using the information to solve the problem. Partner B helps and asks for explanations, even if he or she understands what Partner A is doing. This discussion will also help Partner B understand what the problem is that they will be solving.
5. SOLVE: Both partners should solve the problem using the information gathered during the discussion. Partners should then share and justify their solution strategies and their answers.
6. FOLLOW-UP: As a follow-up step, have both students use blank cards to write their own similar problem card and data card for other pairs to use.

For a direct link, go to: <http://www.achievethecore.org/page/615/comparing-money-raised>

## LANGUAGE DEVELOPMENT

Ensure students have ample opportunities in instruction to read, write, speak, listen, and understand the mathematical concepts that are represented by the following term:

- Times as much

Students should engage with these term in the context of mathematical learning, not as a separate vocabulary study. Students should have access to multi-modal representations of these term, including: pictures, diagrams, written explanations, gestures, and sharing of non-examples. These representations will encourage precise language, while prioritizing students' articulation of concepts. This term should be reinforced in teacher instruction, classroom discussion, and student work

ELLs may need support with the following vocabulary words during the classroom discussion:

- Raised
- Information

## ADDITIONAL THOUGHTS

Multiplicative comparison situations come in several different types. See Table 2 on page 89 of the Standards and page 23 of the progression document, *K–5 Operations and Algebraic Thinking*, available at [www.achievethecore.org/progressions](http://www.achievethecore.org/progressions).

## 4.OA Comparing Money Raised

### Task

- a. Helen raised \$12 for the food bank last year and she raised 6 times as much money this year. How much money did she raise this year?
- b. Sandra raised \$15 for the PTA and Nita raised \$45. How many times as much money did Nita raise as compared to Sandra?
- c. Luis raised \$45 for the animal shelter, which was 3 times as much money as Anthony raised. How much money did Anthony raise?



4.OA Comparing Money Raised  
Typeset May 4, 2016 at 22:00:57. Licensed by Illustrative Mathematics under a  
Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License .

<p><b>Comparing Money Raised</b></p> <p><b>Data Card 1</b></p>	<p><b>Comparing Money Raised</b></p> <p><b>Problem Card 1</b></p>
<ul style="list-style-type: none"> <li>• Helen raised \$12 for the food bank last year.</li> <li>• Helen raised 6 times as much money for the food bank this year.</li> </ul>	<p>A group of friends raised money for charity. Helen raised money for the food bank last year and again this year. How much money did Helen raise this year?</p>
<p><b>Comparing Money Raised</b></p> <p><b>Data Card 2</b></p>	<p><b>Comparing Money Raised</b></p> <p><b>Problem Card 2</b></p>
<ul style="list-style-type: none"> <li>• Sandra raised \$15 for the PTA.</li> <li>• Nita raised \$45 for the PTA.</li> </ul>	<p>A group of friends raised money for charity. Sandra and Nita raised money for the PTA. How many times as much money did Nita raise as compared to Sandra?</p>
<p><b>Comparing Money Raised</b></p> <p><b>Data Card 3</b></p>	<p><b>Comparing Money Raised</b></p> <p><b>Problem Card 3</b></p>
<ul style="list-style-type: none"> <li>• Luis raised \$45 for the animal shelter.</li> <li>• Luis raised 3 times as much money as Anthony raised for the animal shelter.</li> </ul>	<p>A group of friends raised money for charity. Luis and Anthony raised money for the animal shelter. How much money did Anthony raise?</p>

---

## Commentary

The purpose of this task is for students to solve three comparisons problems that are related by their context but are structurally different. Multiplicative comparison is purposefully excluded from third grade (see 3.OA.3 and 3.MD.2), making this task appropriate for fourth but not third grade.

In these multiplicative comparison problems, one factor and the product are amounts of money and the other factor represents the number of times bigger one amount is than the other. Sometimes this second factor is called a “scale factor.” In part (a), the larger amount (which is the product) is unknown, while in part (b) the scale factor is unknown and in part (c) the smaller amount of money is unknown. Students will study multiplicative comparison problems involving scale factors that are fractions in 5th grade; see 5.NF.B.5. Note that in fourth grade, scale factors must always be bigger than 1, so students often think that “multiplying makes bigger”; however in 5th grade they will see that when the scale factor is less than 1, the product will actually be smaller than the initial quantity.

Note that the numbers in parts (b) and (c) are related by the fact family  $3 \times 15 = 45$ . This allows for a classroom discussion about the different interpretations of the factors in a multiplicative comparison context.

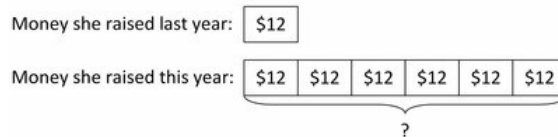
To see an annotated version of this and other Illustrative Mathematics tasks as well as other Common Core aligned resources, visit [Achieve the Core](#).

---

## Solutions

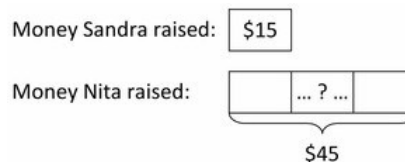
Solution: Tape diagram

- a. She raised six times as much money (as shown in the diagram) so she raised  $6 \times 12 = 72$ .



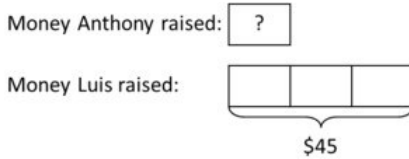
Helen raised \$72 this year.

- b.  $? \times 15 = 45$  is equivalent to  $45 \div 15 = ?$



Nita raised 3 times as much as Sandra.

- c.  $3 \times ? = 45$  is equivalent to  $45 \div 3 = ?$



Anthony raised \$15.

Solution: Writing multiplication equations for division problems

- a. Helen raised  $6 \times \$12$  this year, so she raised \$72 this year.
- b. This is a “Number of Groups Unknown” problem. We can represent the question as

$$? \times 15 = 45$$

or

$$45 \div 15 = ?$$

So Nita raised 3 times as much money as Sandra.

- c. This is a “Group Size Unknown” problem. We can represent the question as

$$3 \times ? = 45$$

or

$$45 \div 3 = ?$$

So Anthony raised \$15.



4.OA Comparing Money Raised is licensed by Illustrative Mathematics under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License