InsightMath California

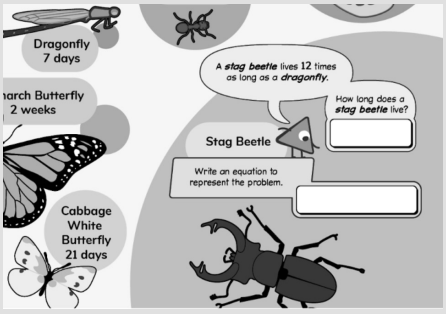
# Discovering Multiplicative Comparisons

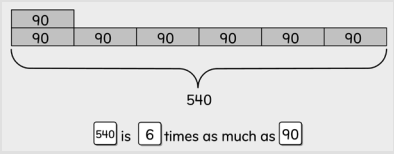
Family Guide | Grade 4 | Unit 2

**Your student is exploring how multiplication can be used to compare quantities and measurements.**

## Key Math Ideas

In this unit, your student will learn a new way to think about multiplication. Instead of just adding equal groups together, they will use multiplication to compare different amounts. For example, they will understand that 30 feet is 10 times as long as 3 feet. This new understanding helps your student see how one quantity can be a multiple of another. They will apply this thinking to measurements, learning how different units relate to each other. These skills build an important foundation for future math learning. The patterns they discover now will help them later when they work with ratios, rates, and more advanced math concepts.

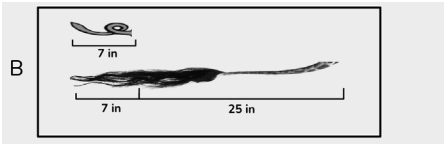


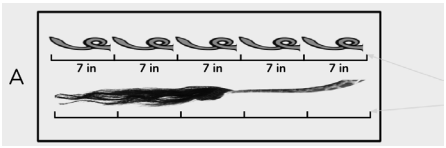

The example to the left shows using a bar model to show the multiplicative relationship.

### → In the first half of the unit, your student will learn to

- use comparison language to describe additive relationships, such as 12 is three more than 9;
- use comparison language to describe multiplicative relationships, such as 12 is three times as much as 4;
- represent multiplicative comparison situations using bar models and equations;
- solve multiplicative comparison word problems, such as finding what amount is three times as much as 5.



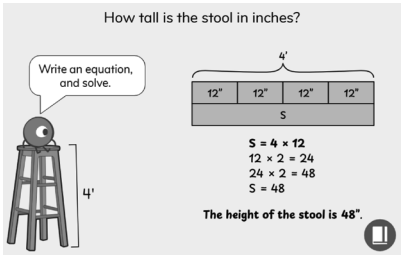

The giraffe's tail is 25 in longer than the pig's tail.




The giraffe's tail is 5 times as long as the pigs tail.

### → In the second half of the unit, your student will learn to

- estimate and measure length (yards and feet), weight (pounds and ounces), and volume (gallons, quarts, pints, cups, and fluid ounces);
- describe relationships between measurement units using multiplicative comparison language (for example, 1 yard is 3 times as long as 1 foot, so to measure the same length, we need 3 times as many feet as yards);
- solve problems involving measurement conversions.




## Helpful Hint

In this unit, students are primarily converting from a larger unit (like yards) to a smaller unit (like inches). In some cases they might convert from smaller to larger units with the support of a conversion table like the one shown the right. For example, for a question like What is the height of someone who is 74"? Students would use the conversion table to find that 74" is 6'2". Students do not work with fractions of a unit, so students might be asked, "How many inches are in 4 feet?" (48 inches), but we would not ask them, "How many feet are in 54 inches?" (4 $\frac{1}{2}$ feet).

| Feet (ft) | Inches (in) |
|---|---|
| 1 | 12 |
| 2 | 24 |
| 3 | 36 |
| 4 | 48 |
| 5 | 60 |

# Tips for Supporting Your Student at Home

## Questions to Ask Your Student

### → In the first half of the unit:

- How you compare these amounts using addition or multiplication?
- How can you represent the problem with a bar model and an equation?

### → In the second half of the unit:

- How can we compare measurements with different units?
- How can we convert between different length units?
- How can we convert between different weight units?
- How can we convert between different units of liquid volume?
- How can you use a conversion table to help you solve the problem?

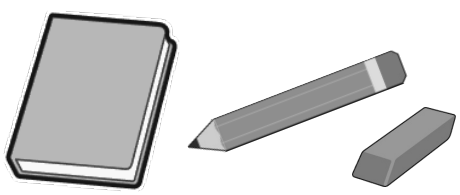
| If... | Try... |
|---|---|
| your student forgets to consider the size of the unit when comparing measurements, such as saying that 15 inches is longer than 3 feet because 15 is greater than 3 . . . | asking your student to physically model each amount, like laying out or drawing 15 inches and 3 feet side by side, so they can see that 15 inches is not greater than 3 feet. Then use a conversion table to discuss their misunderstanding. Ask, "How many inches are in 1 foot? In 2 feet? In 3 feet?" Remind your student that measurements need to be converted to the same unit before they can be compared. |

## Student Strengths Spotlight

| | |
|---|---|
| **I justify my thinking.** | Students explain their reasoning behind their choices, decisions, or problem-solving process, providing evidence or logic to support their perspective. |
| **I am precise with the words I use to explain thinking.** | Students use their own words to explain why they worked out a problem in a certain way, or why they chose a specific strategy to workout a problem. |
| **I use math to represent a real-life situation.** | Students solve real world problems by making models, writing equations, and explaining with mathematical language. |

## Try This Together!

- **Using Comparative Language.** Collect some household objects like an eraser, a pencil, and a book. Encourage your student estimate the lengths of these objects using comparative language like "___ times as long as" or " ___ times as heavy as." You can ask questions like, "How many times longer is the pencil than the eraser?" or if possible you may measure the length or weight of the objects and ask "How many times heavier is the book than the pencil?"



- **Let's Compare!** Gather some household items like a spoon, a cup, and a glass and use them to compare the quantity of water each can hold. For example, find how many spoons of water are required to fill up the cup or how many cups are required to fill up the mug. This will give your student a hands-on experience for how each item is used to measure the quantity of water, though they hold different volumes.