



The Garden Race

A Multiplicative Comparison Schema Story

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About This Book

This book is part of the Word Problem Intervention Program by Numeracy Consultants. It introduces the Multiplicative Comparison schema — a structure that helps students understand multiplication and division word problems involving times as many.

In Multiplicative Comparison problems, one quantity is a certain number of times larger or smaller than another. Students learn to ask:

- What is the smaller amount?
- How many times as many is the larger?
- What is the larger amount?

Dedication

For every student who has ever looked at a math problem and wondered where to begin — this book is your first step. 🌱

The Multiplicative Comparison Schema



Smaller × Times = Larger | *Larger ÷ Times = Smaller* | *Larger ÷ Smaller = Times*



Zara and Leo in the school garden

Chapter 1: The Sunflower Contest

Zara and Leo were best friends who both loved their school garden.

Every spring, they planted sunflowers along the garden fence.

"My sunflowers grew really tall this year!" said Zara.

"Mine grew tall too," said Leo. "But I think yours are taller. How do we compare them?"



Multiplicative Comparison: When one amount is a certain number of *times as many* as another.
Ask: What are we comparing? How many times as many?



Zara

6 feet tall



Leo

2 feet tall



Leo

Zara

Finding the Times

They measured their sunflowers.

"Mine is 6 feet tall!" said Zara.

"Mine is 2 feet tall," said Leo.

Zara thought carefully. "So my sunflower is how many times as tall as yours?"

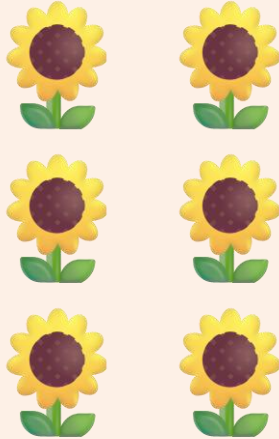
Leo started to think. "We need to figure out how many times 2 feet goes into 6 feet."

Zara's sunflower is 3 times as tall as Leo's



Schema so far: Smaller Amount = 2 feet | Times As Many = ? | Larger Amount = 6 feet

2 → 4 → 6



3 groups of 2 = 6 → 3 times as many!

3 Times As Many!

"I can skip count!" said Leo.

"2 ... 4 ... 6. That's 3 jumps!"

"So your sunflower is 3 times as tall as mine!" he said.

Zara smiled. "Exactly. My sunflower is the larger amount. Yours is the smaller amount. And the times as many is 3."

"It's the same as multiplication!" said Leo. "2 times 3 equals 6."

✓ 2 feet × 3 times as many = 6 feet *Smaller × Times = Larger*

 **Key Idea:** Larger ÷ Smaller = Times As Many. Divide to find how many times as many!



12 carrots — but how many did Leo plant?

Chapter 2: The Carrot Mystery

The next week, Zara and Leo planted carrots.

"I planted 12 carrots," said Zara. "That's 4 times as many as you planted, Leo."

Leo looked at his empty garden patch.

"Wait — so how many did I plant?" he asked.

Zara nodded. "We know the larger amount and we know the times. We need to find the smaller amount!"



Schema so far: Smaller Amount = ? | Times As Many = 4 | Larger Amount = 12 carrots

$$12 \div 4 = 3$$



12 carrots \div 4 groups = 3 in each

Leo Planted 3 Carrots!

"I can divide!" said Leo.

"12 divided by 4 equals... 3!"

"I planted 3 carrots," he said. "And yours is 4 times as many. So 3 times 4 is 12. That checks out!"

Zara clapped. "You used the schema to work backward. When you know the larger amount and the times, you divide to find the smaller amount."

✓ 12 carrots \div 4 times = 3 carrots *Larger \div Times = Smaller*

💡 **Key Idea:** When you know the Larger Amount and the Times As Many, divide to find the Smaller Amount.



× 5



Leo has 3 tomatoes — Zara has 5 times as many!

Chapter 3: The Tomato Harvest

At the end of summer, Leo and Zara counted their tomatoes.

"I have 3 tomatoes," said Leo.

Zara's eyes went wide. "I have 5 times as many tomatoes as you!"

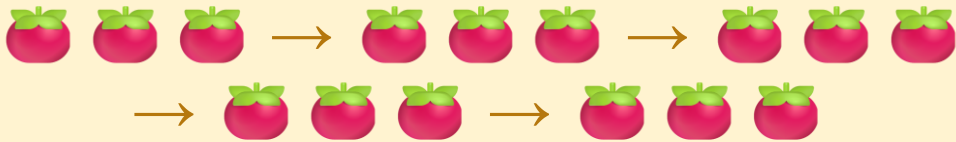
"Whoa," said Leo. "How many tomatoes do you have?"

Zara smiled. "We know the smaller amount and we know the times. We just need to find the larger amount!"



Schema so far: Smaller Amount = 3 tomatoes | Times As Many = 5 | Larger Amount = ?

$$3 \times 5 = 15$$



3, 6, 9, 12, 15 ✓

3 tomatoes \times 5 times = 15 tomatoes!

Zara Has 15 Tomatoes!

"I can multiply!" said Zara.

"3 times 5 equals 15!"

"You have 15 tomatoes?!" said Leo.

"Yes! And it makes sense," said Zara. "The smaller amount times the times as many equals the larger amount. 3 times 5 is 15."

"It's the same schema every time," said Leo. "Just a different piece is missing!"

✓ 3 tomatoes \times 5 times = 15 tomatoes *Smaller \times Times = Larger*



Key Idea: When you know the Smaller Amount and the Times As Many, multiply to find the Larger Amount.

The Multiplicative Comparison Schema

Three kinds of problems — one schema, different missing pieces:

Find the Times As Many



You know the smaller amount and the larger amount.
Find how many times as many.

$$\text{Larger} \div \text{Smaller} = \text{Times}$$

$$6 \text{ ft} \div 2 \text{ ft} = 3 \text{ times as many } \img alt="sunflower icon" data-bbox="245 745 260 765"/>$$

Find the Smaller Amount



You know the larger amount and the times as many.
Find the smaller amount.

$$\text{Larger} \div \text{Times} = \text{Smaller}$$

$$12 \text{ carrots} \div 4 = 3 \text{ carrots } \img alt="carrot icon" data-bbox="555 745 575 765"/>$$

Find the Larger Amount




You know the smaller amount and the times as many.
Find the larger amount.

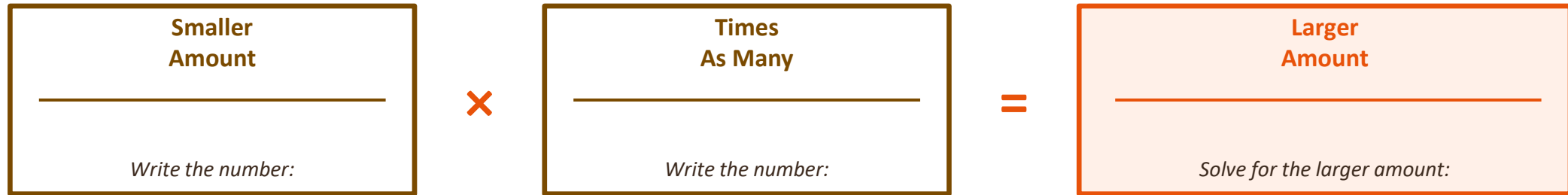
$$\text{Smaller} \times \text{Times} = \text{Larger}$$


$$3 \text{ tomatoes} \times 5 = 15 \text{ tomatoes } \img alt="tomato icon" data-bbox="895 745 915 765"/>$$

Build the Schema

Read the problem. Fill in what you know. Find the missing piece.

 Zara collected 5 leaves on her walk. Leo collected 4 times as many leaves as Zara.
How many leaves did Leo collect?



 **Think aloud:** "What is being compared? Which amount is smaller? Which is larger? How many times as many? Do I know the larger amount, or am I trying to find it?"