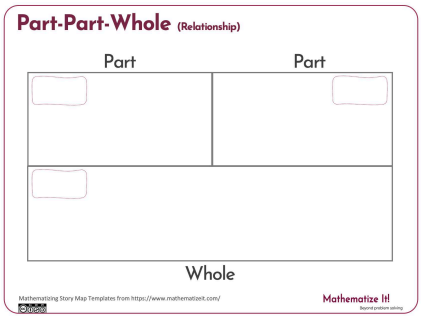
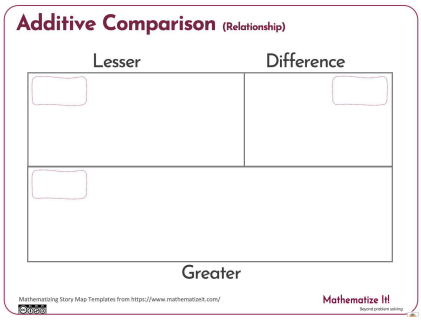
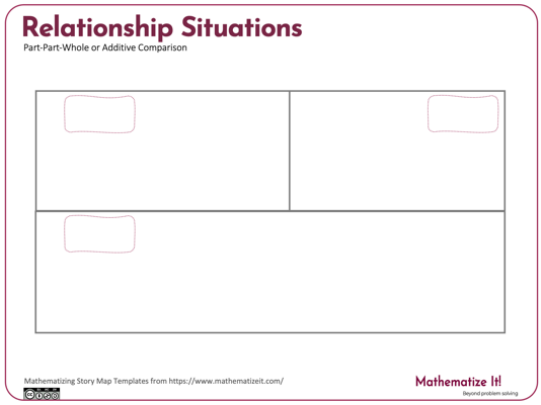
Addition and Subtraction Summary

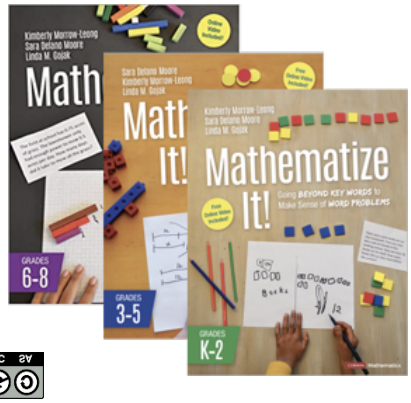
Making sense of word problems with mathematical comprehension & operation sense.

Mathematizing Story Maps









Mathematize It!

Beyond problem solving

Sara Delano Moore and Kimberly Morrow-Leong
Mathematizing Story Map Templates from https://www.mathematizeit.com/

Teacher Notes

Mathematizing Story Maps

Addition & Subtraction Summary

Problem Types

There are four different types that represent all addition or subtraction: Add-To, Take-From, Part-Part-Whole, and Additive Comparison. A Mathematizing Story Map for each, including practice problems, is on our website. Now we look at all four as two separate groups.

Action

The problems in the first group need to be acted out: something moves into the situation (Add-To) or is moved out (Take-Out). These can be called Active (or Action) problem types.

Relationship

The remaining two problem types *feel* different. They describe relationships between the quantities in the problem. A comparison describes how one thing compares to another, or how it measures up. A Part-Part-Whole situation looks at a set of objects that make up a whole set and describes how these objects are the same, but also measures their differences.

Addition & Subtraction Problem Situations

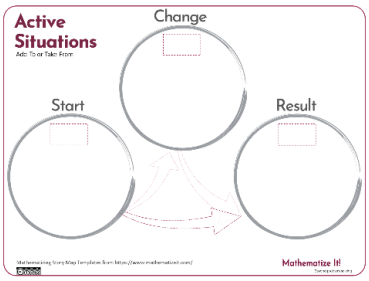
Action Situations	**Add To**	Result Unknown	Change Unknown	Start Unknown
	Take From	Result Unknown	Change Unknown	Start Unknown
Relationship Situations	**Part-Part Whole**	Total Unknown	One Part Unknown	Both Parts Unknown
	Additive Comparison	Difference Unknown	Greater Quantity Unknown	Lesser Quantity Unknown

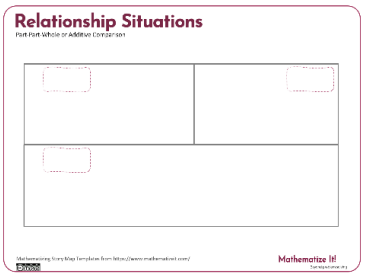
Missing Element

For each of the problems situations one element is typically unknown. For the Action problem types, the story has a start, a change, and an end result. In a Relationship problem situation, the missing elements could be one of the parts or the whole in a Part-Part-Whole, or in the case of the Additive Comparison, the difference, or one of the two compared quantities.

The Mathematizing Story Maps

The two story maps shared this week are more general. One story map helps track the action—it provides the narrative arc for action situations, showing the start, the change, and the result. The other story map uses a bar model to show the relationship among the parts or the comparison under exploration.





Common Structure and Strategies

Begin by reading the story at least once with your class. Talk about the story and support your students as they make sense of the events in the story as you would for any narrative. Then encourage students to find the mathematics in the story with questions like these:

- *Is there action in this story? Is something coming or going?*
- *Does this story compare quantities, sharing which is greater or which is lesser?*
- *Does this story talk about groups or parts of a group that can be combined into a whole?*

These questions ask students to reason about which story map might best support a. If students start calculating numbers right away, particularly if they are "number-plucking" or randomly doing calculations, refocus their attention on the relationship in the story.

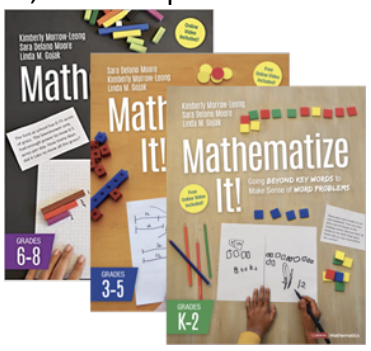
Maya's brother wanted to buy some plants for his goldfish bowl. He spent $1.75 on plants and then counted his money. He had $3.50. How much money did he have before he bought the plants?

Different Classes of Number

These practice problems represent some of the many addition and subtraction problems situations in contexts involving fractions and decimals. Work with the quantities under 20 in previous units allows students to focus on the structure of the problem situation without being bogged down in the computation. In these problems, students are now more familiar with the structures and can work on more challenging number classes.

Modifying the Problems

Each problem is identified when it is presented with a possible solution. Feel free to adapt the problems to provide a full range of examples for your students. For example, the third practice problem is shown above and represents active subtraction with the starting value unknown. If students need to practice situations where the change is unknown, use the same situation and rewrite the problem as this, "He had $5.25 and then bought plants. He had $3.50 left. How much did he spend on plants?"



To read more about problem situations and the four operations, check out the ***Mathematize It!*** book series.

Relationship Situations

Part-Part-Whole or Additive Comparison

RELATIONSHIP

Addition & Subtraction Practice Problems

Use objects, pictures, numbers, and words to describe what is happening in each problem. Use a mathematizing story map to record your thinking.

The relay team is running a one-mile race, 4 laps around the track. The leader ran the first lap in 2.5 minutes. The whole race took 9 minutes. How long did it take the rest of the team to run the other 3 laps?
Alisa's family is packing care packages. One box weighs 7.5 kg and the other box weighs 12.75 kg. How much lighter is the 7.5 kg box?
Ninang Janet had her baby a few weeks ago and Limar has a new cousin. Janet said the baby weighs 2 ½ pounds more today than when it was born. The baby weighed 9 ¾ pounds today. How much did the baby weigh when it was born?

RELATIONSHIP

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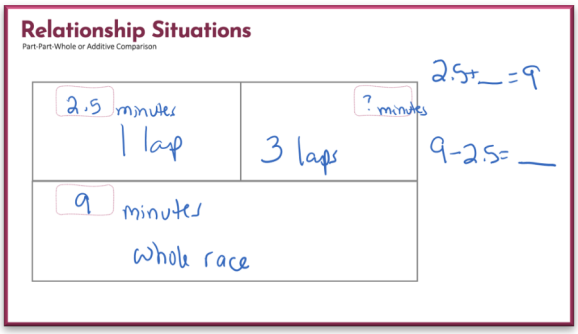

Part-Part-Whole, One Part Unknown

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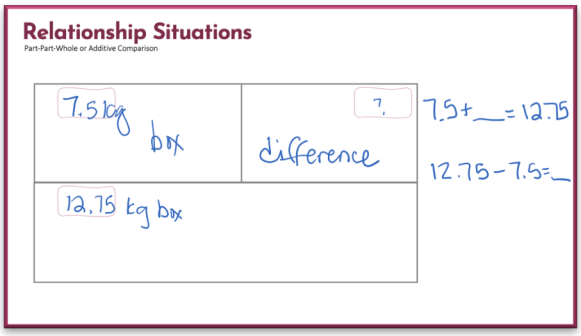
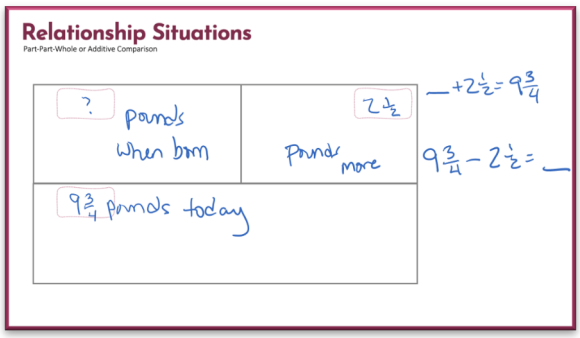


Additive Comparison, Difference Unknown

Ninang Janet had her baby a few weeks ago and Limar has a new cousin. Janet said the baby weighs 2 ½ pounds more today than when it was born. The baby weighed 9 ¾ pounds today. How much did the baby weigh when it was born?



Additive Comparison, Lesser Quantity Unknown