

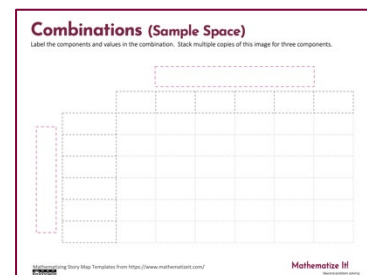
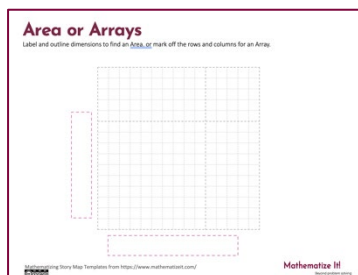
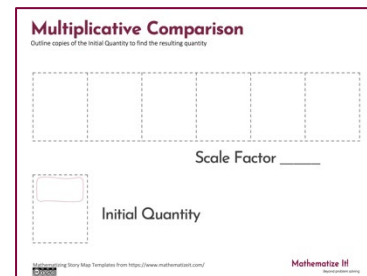
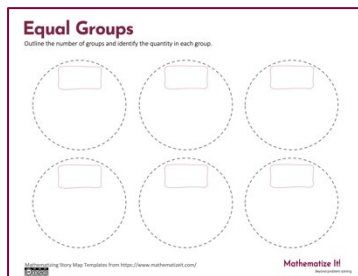
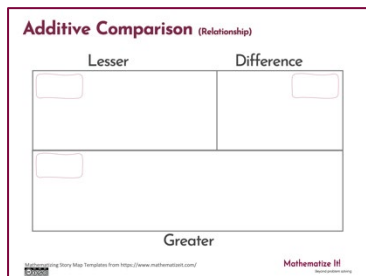
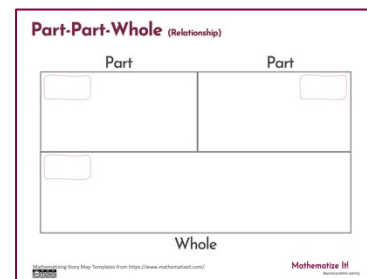
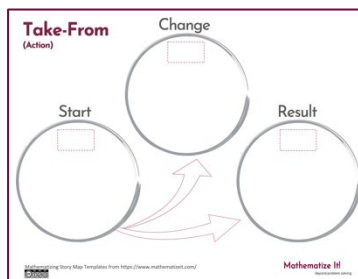
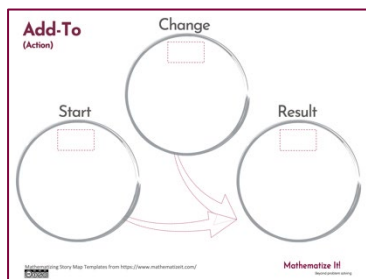
# #5 The Great Escape!



## Take From Change Unknown

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

## Mathematizing Story Maps



# Mathematize It!

Beyond problem solving



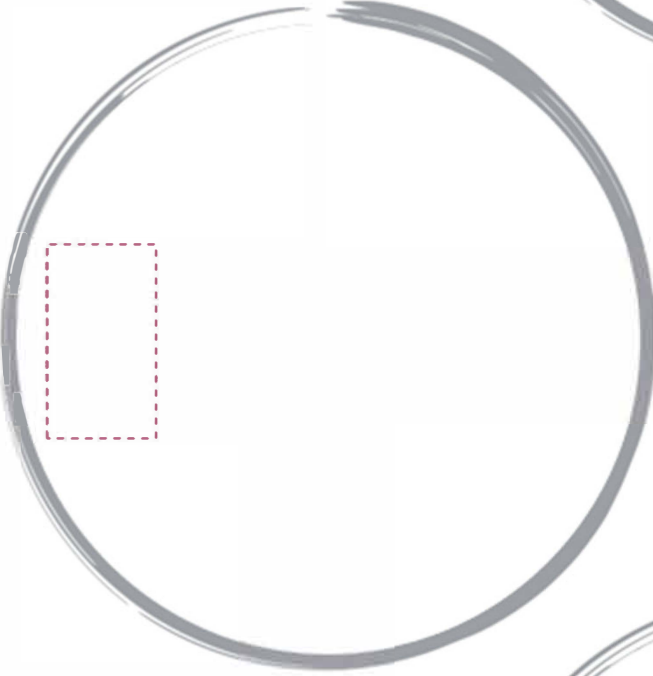
Sara Delano Moore and Kimberly Morrow-Leong

Mathematizing Story Map Templates from <https://www.mathematizeit.com/>

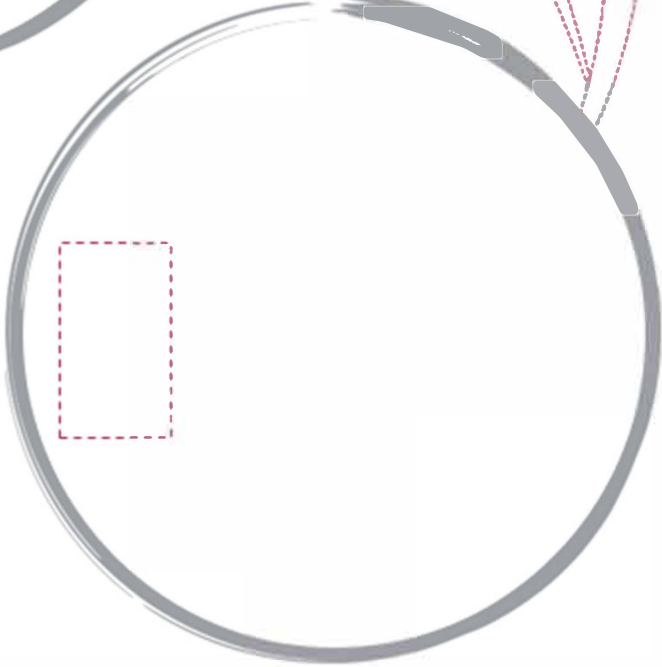
# Take-From

(Action)

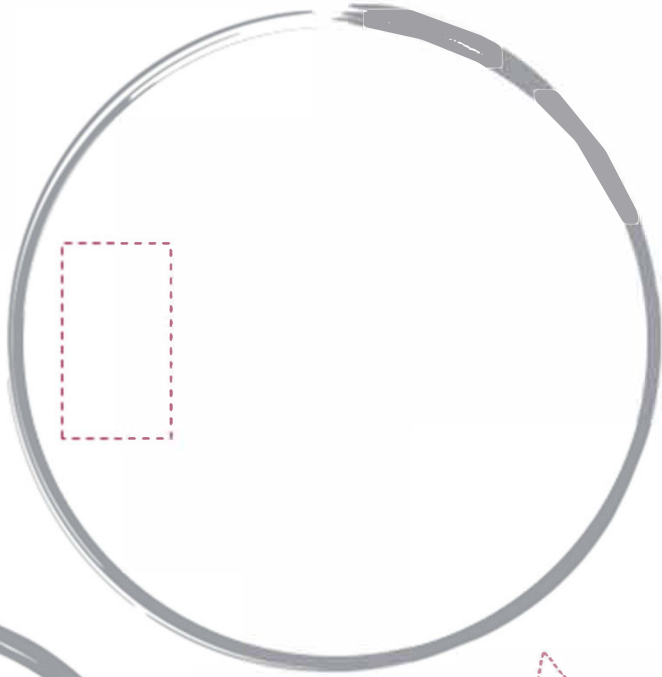
Change



Start



Result



# ... Mathematizing Story Maps ...

How do your students approach word problems?

**Key words** don't always help. What are we supposed to underline in **CUBES** anyway?

Sometimes it feels like students just pick an operation and they don't know why!

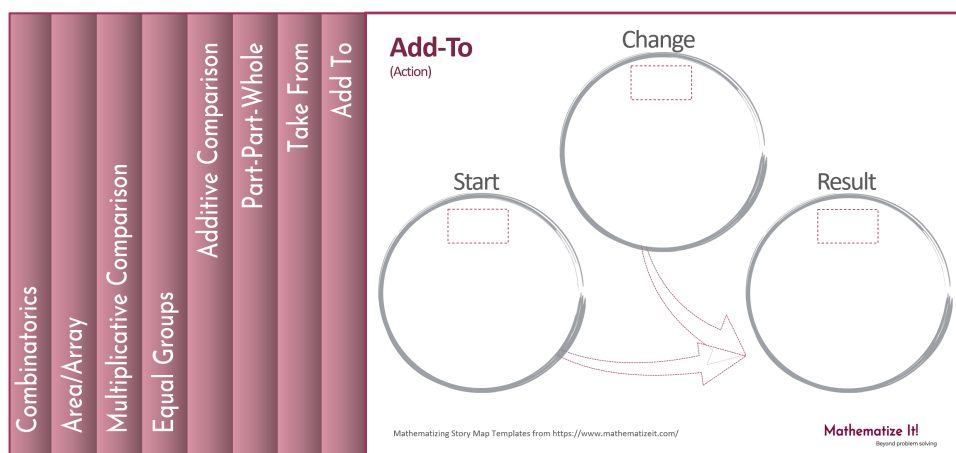
These strategies don't prepare students to formulate and solve **problems that matter** to them.

...  
Prepare students to DO math!  
...

## Teacher Background

Mathematizing Story Maps encourage students to **model** with mathematics and find the math in their everyday lives. Opening stories are written to engage students first in thinking about the **story** and then about the mathematics.

Mathematizing Story Maps help students understand what the four familiar operations (+ - × ÷) can do. The more students know about how we use subtraction or when we use division, the more skills they will have to match a strategy to a problem.



Mathematizing Story Maps by Sara Delano Moore & Kimberly Morrow-Leong  
Find more at [mathematizeit.com](https://www.mathematizeit.com)



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Beyond problem solving

## How to teach the Mathematizing Story Maps

1. **Read the story**
  - a. Think about how your students might respond. What's familiar? What's not?
  - b. What mathematics is seen in the story? How might students **represent their thinking**?
2. **Choose tools you have and that students know.**
  - a. What **manipulatives** might your students use to represent the mathematics in the story? Consider counters, base ten materials, fraction tools, or more!
  - b. What **visual representations** might your students know (ten frames, number tracks, number lines, grid paper, etc.)
3. **Choose a Mathematizing Story Map**

We share a mathematizing story map for each of 8 categories of problem situations.



Mathematizing Story Maps help students act out or represent what is happening in a problem and make sense of it.



## What will students do?

Most word problems (story problems) students encounter support their calculation skills. We need to build their understanding of **how to use math** to solve real problems.

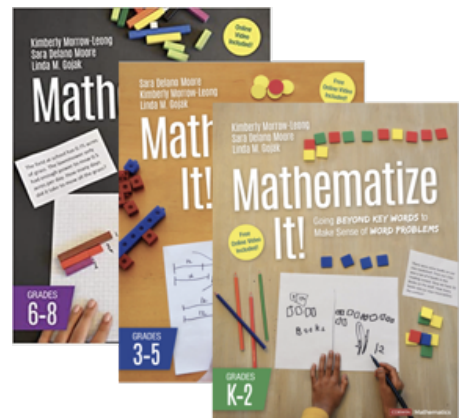
- Find the story behind every mathematical problem situation
- Use one of 8 Mathematizing Story Maps to act it out or show
- Represent the story and choose an operation (+ – × ÷) that matches the story.
- **Resist answer-getting.** We pay attention to the process of solving problems

## What's included?

Each mathematizing story map lesson includes:

- Teaching notes on 8 categories of problem situations.
- Teaching notes for the Mathematizing Story Maps
- A set of questions to pose that focus students on the mathematizing story.

To read more about problem situations and the four operations, check out the [Mathematize It!](#) book series.



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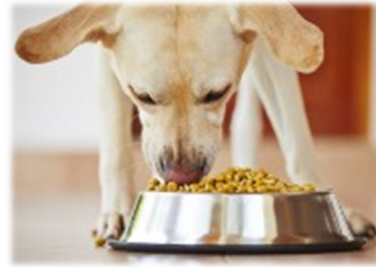


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# Teacher Notes

## Mathematizing Story Maps



### The Great Escape!

#### Problem Type

This story supports developing mathematical ideas around the Take From job of subtraction. The Take From situation follows a storyline where there is a beginning value, a change when something leaves, and a resulting value. In this situation, something will happen, and students will act it out on the Mathematizing Story Map.

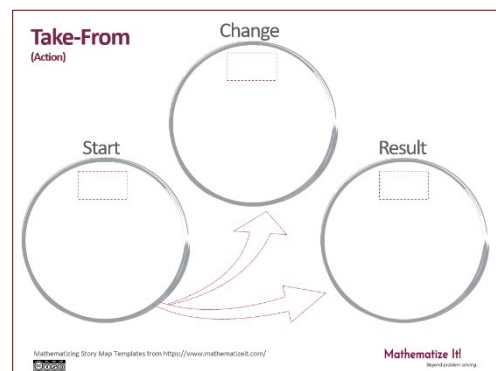
#### Missing Element

In this story, the change is unknown; students are figuring out the middle of the story. Students know the beginning and end of the story and work to figure out what happened in the middle, what quantity changed by leaving the situation.

#### The Mathematizing Story Map

The Mathematical Story Map provided supports the narrative storyline of Take From situations by providing space to show the starting value, the change leaving the situation, and the resulting value at the end.

As you dig into the story, you and your students might also find opportunities to explore Part-Part-Whole situations as well.



#### Addition & Subtraction Problem Situations

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

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**Mathematize It!**

Beyond problem solving

## Day 1

Read 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:

- *What quantities are in the story? How are they changing?*
- *What can you build or draw to show the storyline of a starting value, a change, and an ending value?*
- *How can the story map help record your thinking?*

If students start calculating numbers right away, particularly if they are “number plucking” or randomly doing calculations, refocus their attention on the action in the story.

Encourage students to use manipulatives as they work on the Mathematizing Story Map to show the action that is in the story. Label the quantities and their units. Before ending for the day, give students the opportunity to record their thinking on paper.

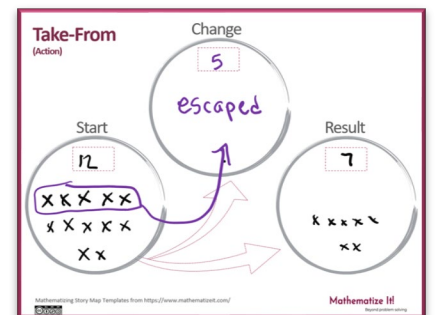
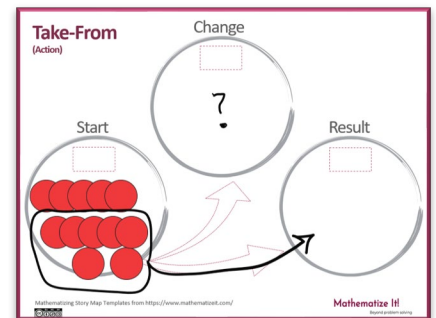
Encourage students to use manipulatives and visuals to show their thinking about the math in the story. Students should translate their work from manipulatives and sketches to the mathematical story map.

## Day 2

Reread the story and use the Mathematizing Story Map to retell it and act it out. Ask your students to translate their actions on the Mathematizing Story Map into an equation. Each student should be able to connect the elements of the story map to the narrative. Discuss the **quantities** in the story and what strategies students might use to find an answer to the question they have asked. Ask students to consider other mathematical stories (or variations on the current story) they can see in this narrative.

You may wish to use the [Three Reads Strategy](#) (p.15) to support student understanding of the text itself.

To focus on the story, create a [numberless word problem](#). Remove the numbers from the story as the class discusses it.



## Day 3

Use the mathematizing story map to support solving the word problems provided. Take time for reading comprehension (does the story make sense?) before mathematical comprehension (what is happening in the story?) These questions can help students develop mathematical comprehension.

- *What quantities are in the story? How are they changing?*
- *What can you build or draw to show the storyline of a starting value, a change, and an ending value?*
- *How can the story map help record your thinking?*

Encourage your students to use manipulatives and visuals to show their thinking about the math happening in each problem. Students should translate their work from manipulatives and sketches to the mathematical story map.

## Days 4-5

Choose one or more of these options to continue developing student thinking.

- Continue working on the problems provided, focusing on the story map as a tool to develop mathematical comprehension and operation sense.
- Lead a discussion among students focusing on how the story map fits the narrative and problems provided. Use these questions to focus thinking on the job subtraction is doing in these situations:
  - *What is the action in each problem? What quantity is leaving the situation as a change?*
  - *How does the story map show the change in the situation?*
  - *Where is each part of the story (beginning, change, and end) shown on the map?*
  - *What number sentence(s) can you write to show what is happening in the story map?*
- Ask students to develop new narratives or problems, either from scratch or as extensions of the current storyline, which can also be told using the same mathematical story map. Encourage students to explain the underlying connections which make the mathematics similar even if the story contexts are not the same.

To read more about problem situations and the four operations, check out the [\*Mathematize It!\*](#) book series.



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**Mathematize It!**

Beyond problem solving

## The Great Escape 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.

Rocky the boxer likes to hide his toys during the night. His person put 15 toys in the basket cleaning up at bedtime. The next morning, there were only 4 toys left in the basket. How many toys did Rocky hide while his family were sleeping?

The kittens love to play with ping pong balls - they are such fun to swat and roll around. Maya opened a new box of ping pong balls, 20 of them, and was excited to watch the kittens play. After a while, she realized there weren't as many balls in the play area. Some must have gotten lost. She counted 14 balls still in the play area. How many were lost?

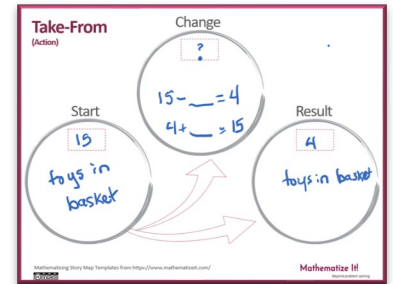
Usually, the puppies and the kittens play separately. Today, Dr. Rodriguez let the puppies in the play room before the kittens left. Maya was playing with 11 kittens. When she picked them up to leave the playroom, there were only 6 kittens to be found. How many kittens were hiding from the puppies?



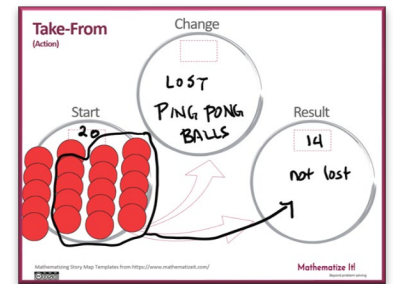
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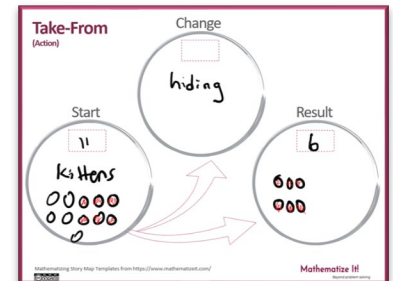
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Take From Situations, Change Unknown

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Beyond problem solving