DMT INSTITUTE

Developing Mathematical Thinking Institute (DMTI)

Professional Development

Curricular Resources

Assessment

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About the DMTI Targeted Activities

These DMTI Targeted Activities modules are designed to be played or completed with a partner or in small groups. These supplement the Primary Math Assessment and DMTI curricular materials.

The activities are intended for teachers or caregivers to play with children to build necessary math skills and math language. Each activity can be played for 10 to 20 minutes. And if there are additional activities in a module, they are built to be more advanced.

PMA – Grade 1

Relational Thinking

Relational Thinking

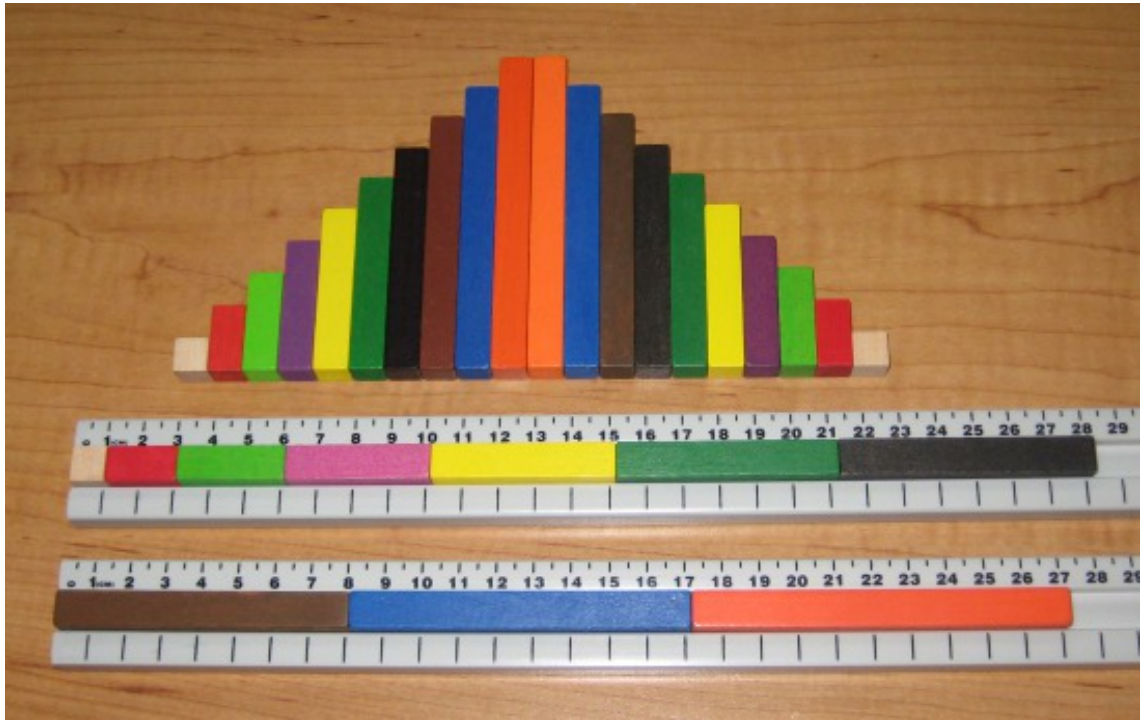
What's involved:

- Seeing the equal sign as a relational symbol rather than strictly computational
- Understanding different equations can be correct even if they are structured in non-conventional ways (e.g. 8=4+4; 9+2=12-1)
- Equivalence is not the same as congruence
  - Example: 4 + 1 = 1 + 4 = 2 + 3 = 5 + 0
  - The above examples are all *equal* but not *exactly the same*.

Why it matters:

- Builds flexible thinking and decomposition of numbers
- Lays the foundation for algebraic thinking
- Broadens students' understanding of equivalence

Playing with Cuisenaire Rods



Cuisenaire Rods: Cuisenaaire Rods

Relational Thinking: What's Missing

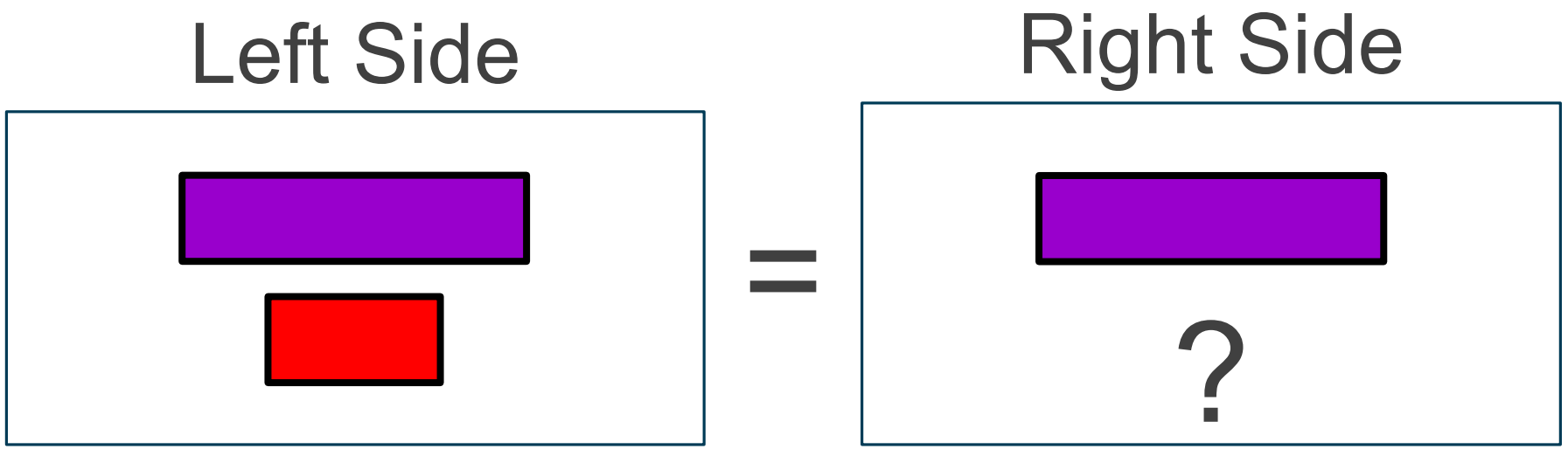
Activity

1. Print out the relational thinking Mat (Template 1).
2. You will need the Cuisenaire Rods or the paper strips in the templates. (Print and cut out rods in Template 2 or 3).
3. Place 2 rods on either side and only 1 rod on the other side.
4. Ask the child to determine what rod is missing.
5. Then, if the white rod is 1, ask what equations makes the statement true.

Relational Thinking: What's Missing

Example

1. Ask: Which rod is missing on the right side to make them the same or equal?
2. Ask: What equations makes the statement true?

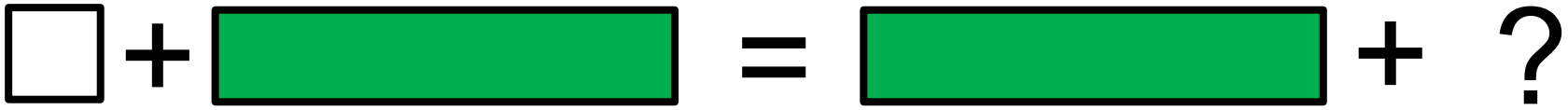


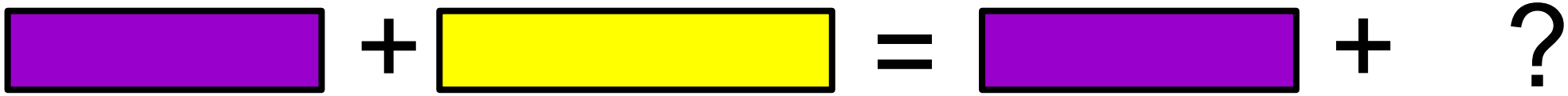
"The red rod is missing on the right side."

"One equation is 4 + 2 = 4 + 2. Another equation is 6 = 6."

Relational Thinking: What's Missing?

Try these problems:

1. 

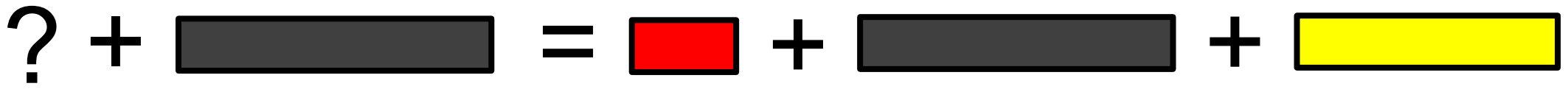
2. 

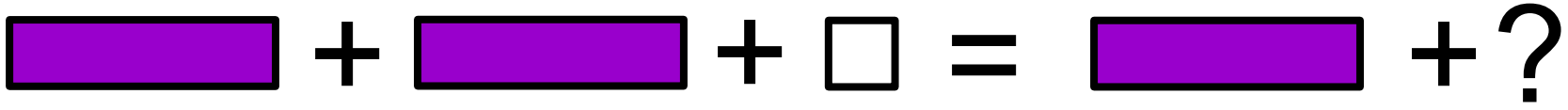
3. 

Relational Thinking: What's Missing?

Try this second set of problems:

4. 

5. 

6. 

7. 

Relational Thinking: What's Missing?

Try this third set of problems.

A. Use the rods to determine whether each equation is true or false.

B. Write the equation that matches the situation.

8. Purple + Light Green = Orange
9. Red + Black = Purple + Dark Green
10. Blue + Dark Green = Purple + Brown + Red
11. Black + Dark Green = Purple + Light Green + White + Yellow

Relational Thinking: What's Missing?

C. If the rods are not equal, which rods can you add to make it true?

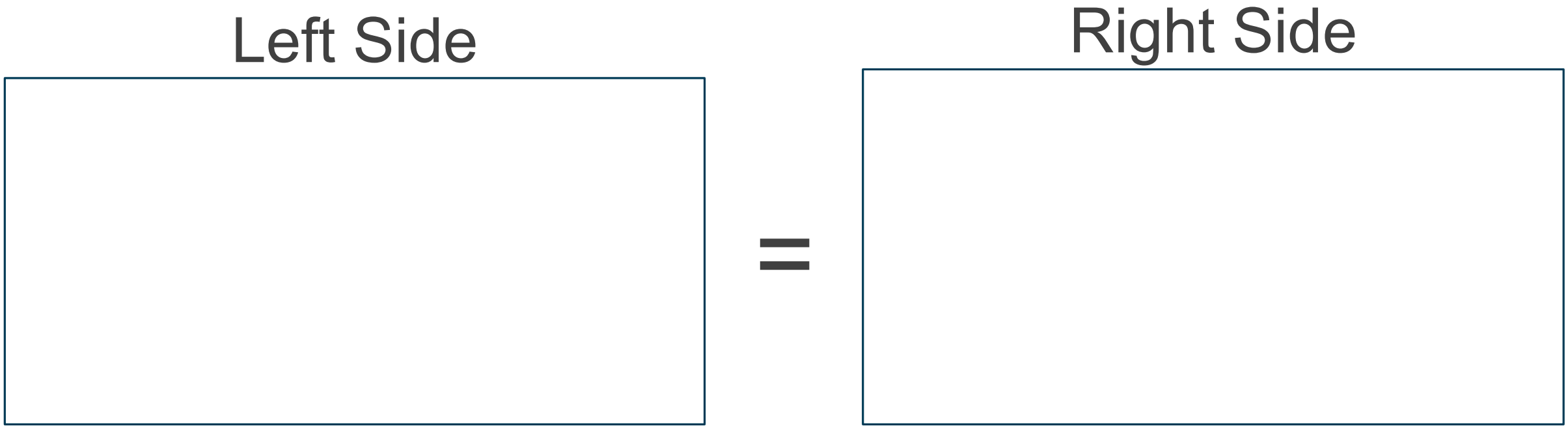
D. Write the new equation that makes the situation true.

8. True
9. False. Add a white rod to the left side. 1 + 2 + 7 = 4 + 6 or 10 = 10
10. False. Add a white rod to the right side. 9 + 6 = 4 + 8 + 1 or 15 = 15
11. True

Relational Thinking: What's Missing?

Now make up your own problems to try with your child. Make sure you ask the types of questions provided earlier.

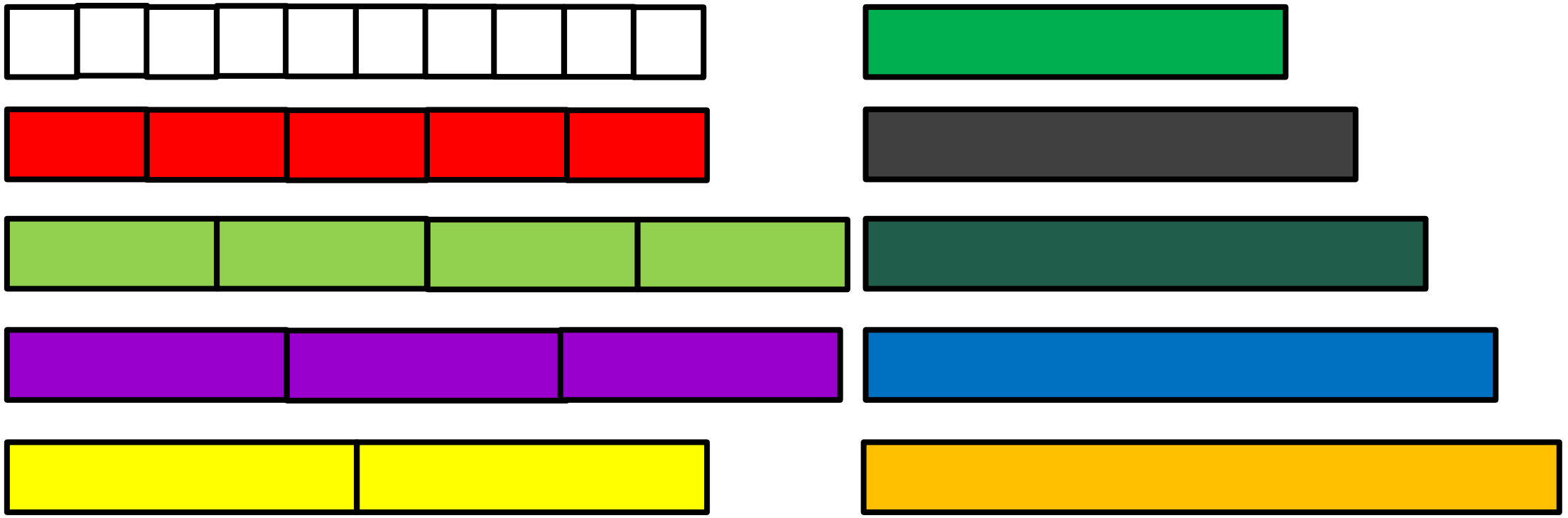
Template 1: Relational Thinking Mat



1. Which rod is missing on the right side to make them the same or equal?
2. What equations makes the statement true?

Template 2 (print and cut these out)

Template 3 (print and cut these out)



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"The Developing Mathematical Thinking Institute (DMTI) is dedicated to enhancing students' learning of mathematics by supporting educators in the implementation of research-based instructional strategies through high-quality professional development, curricular resources and assessments."

For more information contact
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