

CCSS-Aligned Mathematical Task

Snowman Buttons, Grade Kindergarten

By Deborah Atwell, Judy Carrillo, Anna Arredondo-Kim

Task

You are building a snowman. You have 7 buttons, and you can choose from red and yellow. What color combinations of buttons does your snowman have? Show as many ways as you can. Show your thinking with objects, pictures or numbers.

(Extension: Represent any number of buttons up to 10.)

Adapted from the North Carolina Department of Public Instruction, OA Task 5e

Rationale for Lesson

Students will explore ways to decompose seven into its parts by identifying different combinations. Students will represent their possible combinations by identifying possible patterns that allow them to figure out all the possible combinations. Students will understand that two addends can be added in any order (the commutative property of addition) for combinations of seven.

Common Core State Standards for Content

K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by drawing or equation.

Common Core State Standards for Mathematical Practice

MP.1: Make sense of problems and persevere solving them.

MP.2: Reason abstractly and quantitatively.

MP.3: Construct viable arguments and critique the reasoning of others.

MP.4: Model with mathematics.

MP.5: Use appropriate tools strategically.

MP.6: Attend to precision.

MP.7: Look for and make use of structure.

MP.8: Look for and express regularity in repeated reasoning.

The California CCSS Framework:

MP.5: Younger students begin to consider tools available to them when solving a mathematical problem and decide when certain tools might be helpful. For

instance, kindergartners may decide to use linking cubes to represent two quantities and then compare the two representations side by side, or later, make math drawing of the quantities. Students decide which tools may be helpful to use depending on the problem or task and explain why they use particular mathematics tools.

MP.7: Younger students begin to discern a pattern or structure in the number system. For instance, students recognize that $3 + 2 = 5$ and $2 + 3 = 5$. Students use counting strategies, such as counting on, counting all, or taking away, to build fluency with facts to 5. Students notice the written pattern in the “teen” numbers – that the numbers start with 1 (representing 1 ten) and end with the number of additional ones. Teachers might ask, “What do you notice when _____?”

DOK Level: 3

Strategic thinking: requires reasoning, planning, using evidence to explain their thinking. The task has more than one possible answer and requires students to justify the response they give.

Enduring Understandings

There is more than one way to break a number into parts. Students can use the commutative property as a strategy to find all of the ways to break numbers apart.

Materials Needed

Crayons
Buttons
Two-colored counters
Task sheet
Poster paper
Picture/photos of snowmen
Connecting cubes
Cube -Train recording sheet

(While ten-frames may be used in this task, it is not the recommended tool, as it does not help the students see the structure of the changing numbers as well as a horizontal or vertical line of connecting cubes or counters. A conversation on this may arise naturally in the Share, Discuss and Analyze Phase, as students share their strategies.)

Set-Up Phase

Opening: “Do you want to build a snowman?” (to the tune of the *Frozen* song)

How many of you have made a snowman before? Or have seen a snowman in the movies or on TV?

Teacher Tip: Look for online images of snowmen to show, a Los Angeles option is a photo of a “sandman.”

Explain to children that they are going to be decorating a snowman. Say: Our snowman will have 7 buttons, and his buttons will be his favorite colors, red and yellow.

Review Vocabulary:

Colors: red and yellow

Buttons (counters or connecting cubes)

Combinations

Number bonds

Total, whole, parts

Structure

Read the problem to the students:

You are building a snowman. You have 7 buttons, and you can choose from red and yellow. What color combinations of buttons does your snowman have? Show as many ways as you can. Show your thinking with objects, pictures or numbers.

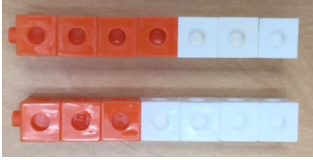
Ensure that the students understand the task by asking: What am I trying to find? What do I know?

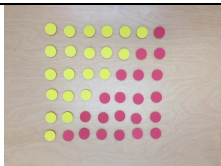
Explore Phase

Students work independently for two minutes, then with partners and small table groups. Consider asking the following questions. While the students are working, strategically select the student work to be presented in the next phase to highlight the goals of the lesson, including MP.5 and MP.7.

Possible Student Strategies	Focusing Questions	Assessing Questions	Advancing Questions
Student has difficulty getting started	How many buttons red and yellow buttons total? If this part is		

Possible Student Strategies	Focusing Questions	Assessing Questions	Advancing Questions
	red, what part would be yellow? How might you show your thinking?		
Student has one solution		How does this combination work? How do you know these parts make seven? How did you show your thinking?	What might be another way?
Student shows work with counters or linking cubes only		Why did you choose this particular tool? How does it match the problem?	How might you record your work? How might you record the numbers represented?
Student shows solution with drawings only			What are other ways to share your thinking? How might you show your thinking with numbers?
Student shows linking cubes with alternating colors	How might you organize the cubes to see all the red and all the yellow?	How might you group the cubes to see the varieties of ways to make seven?	

Possible Student Strategies	Focusing Questions	Assessing Questions	Advancing Questions
		What is the same? What is different? What happens to the number of white cubes when you increase the number of red cubes?	What would happen if you had two red cubes? How can you organize your thinking?
Student uses the cube-train recording sheet for two or more combinations		How might you arrange the different combinations to see if you have them all?	What structure do you see? What combinations are missing?
 Student shows a structure with cubes		What is the pattern?	How might you use the structure to help you know if you have all of the combinations?
Student shows a number bond/s		How do you match this to the story?	How do you know you have all the combinations to make 7?
Student shows 1 & 6, but not 6 & 1	What is the opposite of 1 & 6?		

Possible Student Strategies	Focusing Questions	Assessing Questions	Advancing Questions
Student shows 3 & 4, and 4 & 3 		What is the same and what is different?	How can you write an equation to match your counters?
 Student shows a structure with counters		How do you describe the structure?	How do you know if you have all of the combinations?

Share, Discuss, and Analyze Phase

Teacher orchestrates the whole class discussion on the strategies students used. Consider the sequencing of the student work to build to the pattern structure, so that students experience the “ah-ha!” rather than having it described by the teacher.

$$\begin{aligned}
 0 + 7 &= 7 \\
 1 + 6 &= 7 \\
 2 + 5 &= 7 \\
 3 + 4 &= 7 \\
 7 &= 4 + 3 \\
 7 &= 5 + 2 \\
 7 &= 6 + 1 \\
 7 &= 7 + 0
 \end{aligned}$$

Make explicit connections showing the total on the left side of the equal sign to reinforce equal signs as “is the same as.”

Ask students to discuss their choice of tool, was it the best tool for the job?

Students demonstrate their internalization of the Enduring Understanding of “There is more than one way to break a number into parts,” when they describe in their own words the process that they used.

Application

Create a classroom poster for children who would like to record their equations

for future reference.

Summary

Numbers can be broken apart in multiple ways, just as we broke apart the number 7. The commutative property can help us find all of the combinations of a number. We can organize the different combinations to help us.

Quick-Write

Pick your favorite combination of buttons and draw it on a snowman.

Student Task Sheet

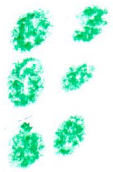
Name: _____

You are building a snowman. You have 7 buttons, and you can choose from red and yellow.

What color combinations of buttons does your snowman have?
Show as many ways as you can. Show your thinking with objects, pictures or numbers.

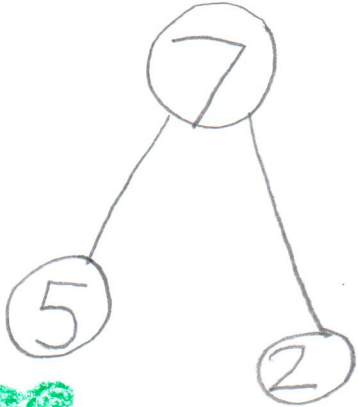
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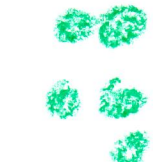
Victoria


$$1 + 6 = 7$$


$$6 + 1 = 7$$

$$0 + 7 = 7$$

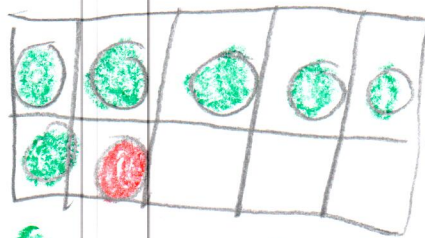



$$4 + 3 = 7$$


$$2 + 5 = 7$$

11-14-14

$$7 + 0 = 7$$



$$4 + 3 = 7$$

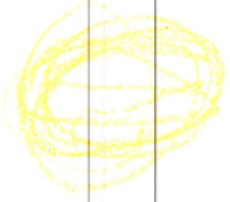
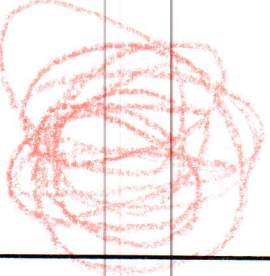
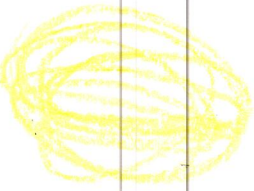
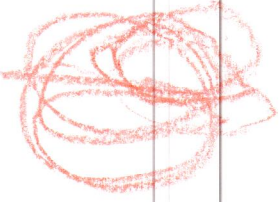

$$3 + 4 = 7$$

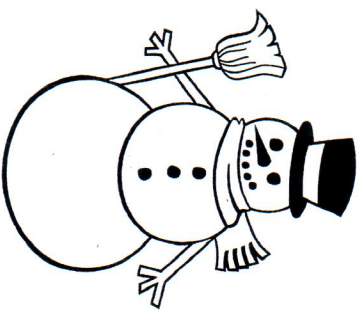

$$1 + 6 = 7$$

Ten Frame Mat

Name: _____

116



$$7 + 3 = 10$$

Name: _____

John

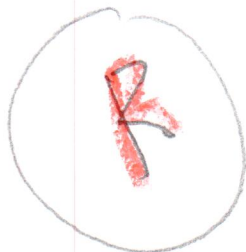
A snowman has 7 buttons. Some of the buttons are red and some of the buttons are yellow. How many red and yellow buttons does the snowman have?



Show as many ways as you can. Show your thinking with objects, pictures or numbers.



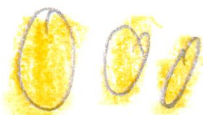
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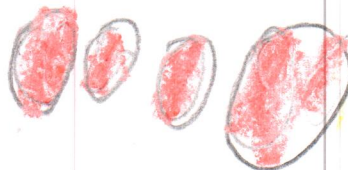
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4 = 7



+

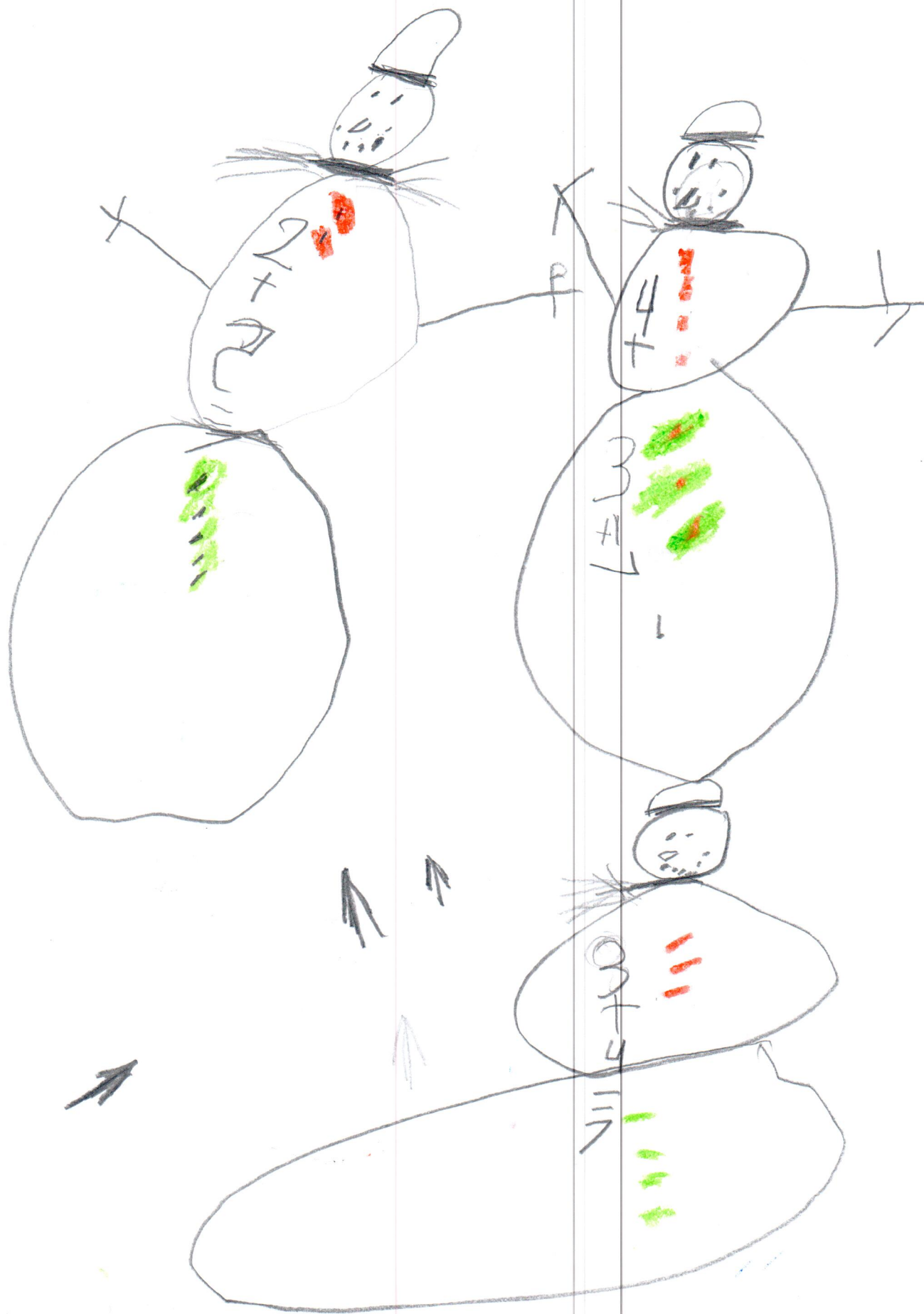


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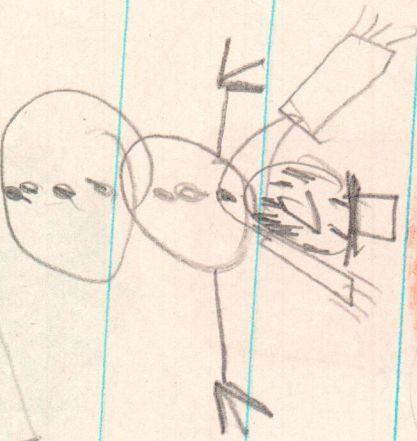
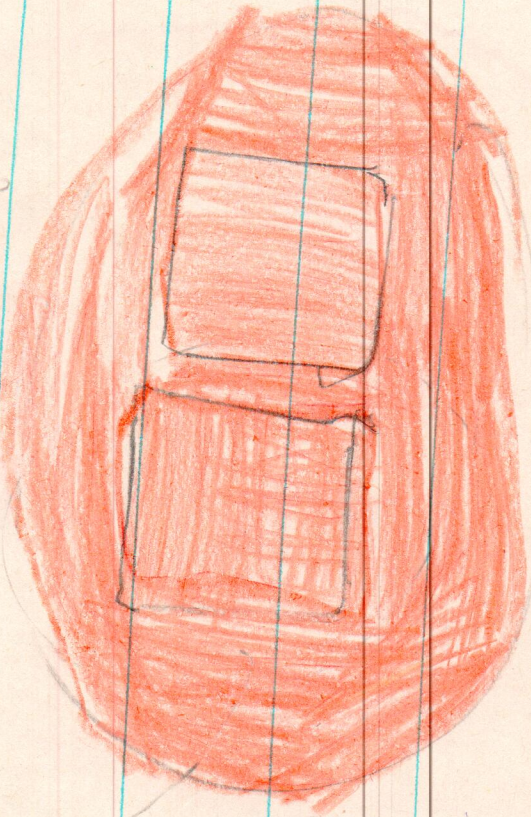
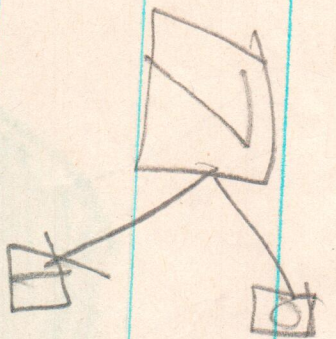
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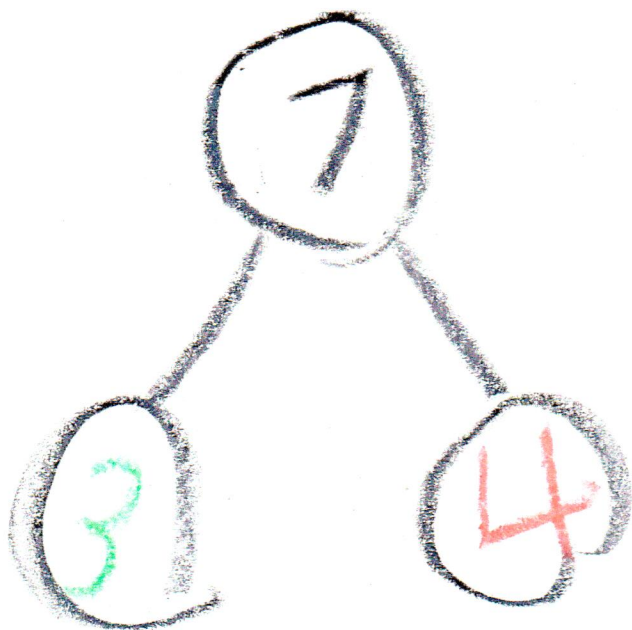
2 = 7



Emilio

$$5 + 2 = 7$$





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+ 119

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