



CONSTRUCTING TASK: Shake and Spill Addition (5 Or 10)

Approximately one day and repeated through centers (adapted from Marilyn Burns' Shake and Spill activity found in About Teaching Mathematics: A K-8 Resource)

STANDARDS FOR MATHEMATICAL CONTENT

MCCK.OA.1. Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

MCCK.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 a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).

MCCK.OA.4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

MCCK.OA.5. Fluently add and subtract within 5

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

“When parts of a set are known, addition is used to name the whole in terms of the parts.” (Van de Walle & Lovin 2006) *Shake and Spill* allows children to focus on a single number for the entire activity. It is important to give the children time to work on a single number (usually to 4 or 5, at first) throughout the activity, allowing them opportunities to explore through a variety of materials and methods of joining or separating. As their understanding of concepts develop, encourage students to extend their understanding with higher numbers. Allowing students multiple opportunities to participate in these types of activities gives them the chance to think about number relationships in a relaxed setting (Burns 2007; Van de Walle & Lovin 2006).

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This activity reinforces the concept of addition (and the inverse, subtraction) through part-part-whole models. For students to see the two parts and the whole, the two parts must be kept as two separate parts.

ESSENTIAL QUESTIONS

- Does the order of addends change the sum? Give examples to justify your thinking.
- How do you know when your answer makes sense?
- How can I represent problem situations using objects, pictures, and numbers?
- Why is it important that I can build the number combinations for the number 5? 10?

MATERIALS

- Two-color counters
- One small cup, per student (like a mouthwash cup)
- One dry-erase marker per student
- Shake and Spill recording sheet for addition
- *Anno's Counting House* by Mitsumasa Anno, or another similar counting book

GROUPING

whole/individual/small group task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part 1

Begin this task by “reading” the math picture book, *Anno's Counting House* (Anno 1982) or a similar book. As some of the children in the story move to the other house, ask questions of the group such as, “*Who's gone? How many are gone? If ____ are gone, how many must be in the first house?*” With rich conversation during this story, all combinations of ten will be discussed.

After reading, begin an investigation to explore number relationships within 5 (and later within 10). Give each student a cup of five double-sided counters. Ask students to swirl the cup of counters and then spill them on their table or work space. How many red counters do you see? How many yellow? Then show students how to record what they see using a number sentence. Allow them to write on their table, using their dry-erase marker, the same number sentence. Repeat this process until you see that a majority of your students are ready to practice on their own.

When showing students how to record a number sentence, make sure to identify all the parts: the addends, the equal sign (can be read, “the same as”), and the answer to an addition number sentence, or sum. Take care to ensure that students can differentiate between the term “sum” and the word “some”. Once students demonstrate an understanding of the activity, allow them to do the activity on their own. Assign each student a number of counters to work with according to his

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or her ability level (5 or 10). Each student will swirl and spill the counters in his cup, draw what they see, and write a number sentence that describes what is shown.

Possible solutions: $5 = 0+5$, $0+5=5$, $4+1=5$, $1+4=5$, $3+2=5$, $2+3=5$
 $10+0=10$, $0+10=10$, $9+1=10$, $1+9=10$, $8+2=10$, $2+8=10$, $7+3=10$,
 $3+7=10$, $6+4=10$, $4+6=10$, $5+5=10$

Possible questions that engage students:

When recording the number of red sides and yellow sides each time you spill the counters, do you think you'll get one result more often than others?

If so, what will it be? How do you know?

Have students write in their math journal about the activity they participated in today. Ask them to list how many number combinations they were able to make for 5 or 10. What did they notice about those combinations?

FORMATIVE ASSESSMENT QUESTIONS

- Does the order of the addends change the sum? Explain your thinking.
- How do you know when your answer makes sense?

DIFFERENTIATION

Extension

- Play, “Five-Frame Tell-About” (Van de Walle, page 46). This game could also be changed to “Ten-Frame Tell-About”.

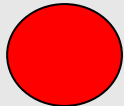
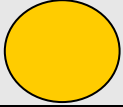
Intervention

- Allow students who have difficulty with organization to use a 5 or 10s frame. As they spill the counters, have them fill up the frames with the counters and then record their findings.
- Students may use a part-part-whole mat for this activity. A part-part-whole mat can be as simple as the table below on white paper.

Part	whole
Part	



Shake and Spill: Addition

Number of Red Counters 	+	Number of Yellow Counters 	= is the same as:	Total Number of Counters