# PRACTICE TASK: Going Bananas

Approximately 1-2 days

## STANDARDS FOR MATHEMATICAL CONTENT

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

**MCCK.OA.2** Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

**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

Students need to develop an understanding of part-whole relationships as they recognize that a set of objects (5) can be broken into smaller sub-sets (3 and 2) and still remain the total amount (5). In addition, this objective asks students to realize that a set of objects (5) can be broken in multiple ways (3 and 2; 4 and 1). Thus, when breaking apart a set (decompose), students use the understanding that a smaller set of objects exists within that larger set (inclusion).

Use of the recording sheet for this task is optional because students need to learn to draw a representation of what they are thinking for three reasons:

*SMP2. Reason abstractly and quantitatively.*
*SMP3. Construct viable arguments and critique the reasoning of others.*
*SMP4. Model with mathematics.*

By encouraging students to organize their work and draw representations, students can begin to "talk through" their process. This enables students the opportunity to attend to precision as they explain and reason mathematically. Using tables, numbers, pictures and words allows students to become more efficient when identifying patterns in numbers and making generalizations.

Commutative property might be identified during this task. Have students discuss whether or not to include commutative properties as possible combinations. There is no right or wrong answer, students should construct viable arguments and explain why their combination of bananas is correct. In addition students must be willing to analyze and critique the reasoning of others.

## ESSENTIAL QUESTIONS

- What happens when I decompose a quantity?
- How can I use different combinations of numbers to represent the same quantity?
- 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?

## MATERIALS

- Paper
- Pencil
- Accessible manipulatives
- 5 bowls per group/student

## GROUPING

Whole, Individual, Small group task

## TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

It is useful to think of problem-based lessons as consisting of three main parts: *before, during, and after.* If you allot time for each part it is quite easy to devote a full period to one seemingly simple problem. (Van de Walle p.15-19)

The Before Phase: get students mentally prepared for the task, be sure the task is understood, and be certain that you have clearly established expectations beyond simply getting an answer.

The During Phase: the most important thing here is *let go!* Give students a chance to work without your guidance. Give them an opportunity to use *their* ideas and not simply follow directions. Your second task is to listen. Find out how different children or groups are thinking,

what ideas they are using, and how they are approaching the problem. In this phase hints may be provided but not solutions, and students should be encouraged to test ideas.

The After Phase: this is often where some of the best learning takes place. During the after phase students share emerging ideas and the community of class learners is developed. This will not develop quickly or easily and will be developed over time.

(*For a more detailed description of the three-phase problem-based learning model see Van de Walle Teaching Student-Centered Mathematics K-3 pp 15-19)*

The task presented to students is as follows:

> *The monkeys loved to pick bananas. They loved to count their bananas and put them into baskets. If the monkeys picked 5 bananas one morning, what are all the possible ways they could put the bananas into baskets? Explain and justify.*

Possible solutions for decomposing 5 (The concept of commutative property can be explored but only if it is discovered by students.

5 = 1 + 1 + 1 + 1 + 1
5 = 2 + 1 + 1 + 1 + 0
5 = 2 + 2 + 1 + 0 + 0
5 = 3 + 1 + 1+ 0 + 0
5 = 3 + 2+ 0 + 0 + 0
5 = 4 + 1+ 0 + 0 + 0
5 = 5 + 0 + 0 + 0 + 0

Comment: Although the standard addresses pairs of numbers to 5, teaching open ended word problems in a context allow students to go above and beyond the expectation of the standards. As a possible closing or follow up to this task, ask students to identify only the pairs of numbers that make 5 when combined. This can be achieved by limiting the number of bowls to 2.

## FORMATIVE ASSESSMENT QUESTIONS

- Are there any more was to decompose the number 5? How do you know?
- Why did you decide to do it his way?
- Are you sure that you have found them all? Why do you think so? How do you know?
- Did you develop a shortcut to find your answers?
- Did you identify any patterns or rules? Explain!
- What is the most number of baskets the monkeys could use?
- What is the fewest number of baskets the monkeys could use?

## DIFFERENTIATION

### Extension

- Students can be encouraged to find the solution for multiple quantities of bananas. In addition, students can create a story problem using a quantity of 5.

### Intervention

- Allow students to work through the stages at a speed that is appropriate for their performance level. Some students may need additional experiences acting out problems, using manipulatives, or drawing pictures.
- Students can use cut out pictures of bananas and act out the story by placing the cut outs in bowls or pictures of bowls.
- Start with a smaller number than 5 and allow students to build and generalize with the patterns that they are seeing. In addition, you could limit the number of baskets that a student uses.

## Going Bananas

The monkeys loved to pick bananas and put them into baskets. If the monkeys picked 5 bananas one morning, what are all the possible ways they could put their bananas into baskets? Explain and justify.

## Going Bananas

The monkeys loved to pick bananas and put them into baskets. If the monkeys picked 10 bananas one morning, what are all the possible ways they could put their bananas into baskets? Explain and justify.