PERFORMANCE TASK: Monkeys at the Zoo

Approximately 1 day

STANDARDS FOR MATHEMATICAL CONTENT

MCC1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

a. 10 can be thought of as a bundle of ten ones — called a "ten."
b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

MCC1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
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 should have had prior experience with the steps involved in problem solving and a variety of problem solving situations. Students should be familiar with how to use a variety of manipulatives to help with representations in problem solving.

ESSENTIAL QUESTIONS

- How can large quantities be counted efficiently?
- How can words be used to illustrate the comparison of numbers?
- How can benchmark numbers build our understanding of numbers?
- How are problem-solving strategies alike and different?
- How can problem situations and problem-solving strategies be represented?

MATERIALS

- "Monkeys at the Zoo" student task sheet
- Monkey cut outs, if needed
- Small manipulatives (counters, base ten blocks, unifix cubes, etc.)
- Chart paper
- highlighters

GROUPING

Individual or partner

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students together in a common area. Review the steps of problem solving and present the following on the board or chart paper:

Forty-eight new monkeys arrive at the zoo.
The zookeeper, Katy, needs to put them into cages.
Each cage can hold any number of monkeys up to 10. How many cages does she need?
Show at least 2 different ways the zoo keeper can put the 48 monkeys in cages.

Discuss how this problem can be solved (using blocks to represent monkeys and circles or boxes to represent cages, making drawings etc.) Discuss different plans for solving the problems. Allow students to share strategies such as draw a picture, act it out, make a list, guess and check, find a pattern, create a chart, work backwards, etc.

Have students work with a partner to complete the problem solving steps. Pass out the student task sheet and the monkey page if needed. Students may want to use the monkeys as their choice representation. Refer to the previous task if the students are not familiar with the steps of problem solving. The teacher should walk around and observe students while they work. Ask student pairs about their plan, including if the plans make sense, etc. Ask questions such as: What led you to choose this particular plan? How do you know your plan makes sense? Tell me about these numbers, are they odd or even? How many tens are in this number? Ones?

Guide and observe students as they work in partners. The teacher should remind the students to use pictures, words, and numbers to explain their solutions and justify their thinking. After ample work time, call students back to a common area. Allow students volunteers to share their steps in problem solving. Discuss the similar plans and the unique plans. This is an open-ended question and will have different combinations of responses. Include discussion of how each solution works.

FORMATIVE ASSESSMENT QUESTIONS

- Can drawing pictures help you solve this problem?
- Can you write a number sentence or use words to communicate your thinking?
- Can you identify the amount of tens and ones in a given number?

DIFFERENTIATION

Extension

- Present this problem to the students:

  You have 72 rabbits. You need to put the rabbits into cages. Each cage can hold any number of rabbits up to 8. How many cages do you need?

Intervention

- Provide students with manipulatives to represent the animals and paper rectangles to represent the cages and present this problem to the students:

  24 tigers have arrived at the zoo. The zoo keeper needs to put them into cages. Each cage can hold any number of tigers up to 6. How many cages does the zoo keeper need? Use pictures, words, and numbers to prove your math thinking.

Name _____

Monkeys at the Zoo

Forty-eight new monkeys arrive at the zoo.
The zookeeper, Katy, needs to put them into cages. Each cage must have the same number of monkeys.

Show different ways the zoo keeper can put the 48 monkeys in cages.