PRACTICE TASK: Base Ten Pictures

Approximately 1-2 Days (Adapted from *Understanding Numbers: Place Value* by Kathy Richardson – Math Perspectives p. 22, 23.)

STANDARDS FOR MATHEMATICAL CONTENT

MCC2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

a. 100 can be thought of as a bundle of ten tens — called a "hundred."
b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

MCC2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.

MCC2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

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.

*****Mathematical Practices 1 and 6 should be evident in EVERY lesson. *****

BACKGROUND KNOWLEDGE

(Information quoted from Van de Walle and Lovin, Teaching Student-Centered Mathematics: Grades K-3, pages 127)

"Of the groupable models, beans or counters in cups are the cheapest and easiest for children to use. Plastic connecting cubes are attractive and provide a good transition to pregrouped tens sticks. Plastic chain links in ten-link chains are another popular model. Bundles of Popsicle sticks or coffee stirrers are well-known models, but small hands have trouble with rubber bands and actually making the bundles. With most groupable materials, hundreds are possible but are generally not practical for most activities in the classroom."

ESSENTIAL QUESTIONS

- Why should we understand place value?
- What are the different ways we can show or make (represent) a number?
- What is the difference between place and value?
- How can we determine how many tens are in a number?

MATERIALS

- Centimeter graph paper or base-10 patterns
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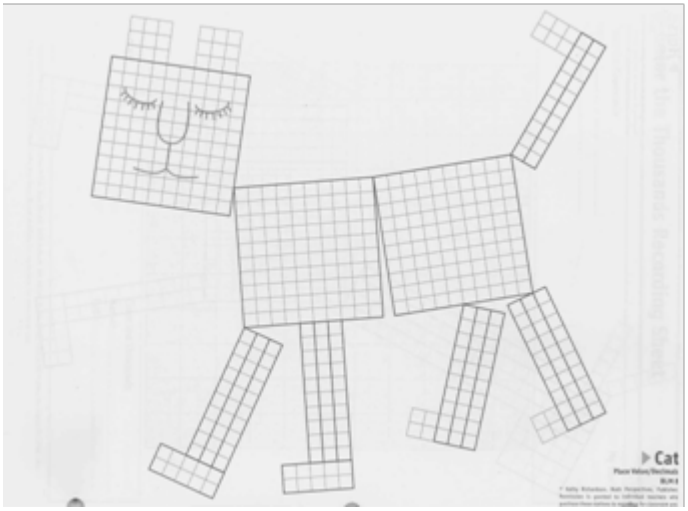
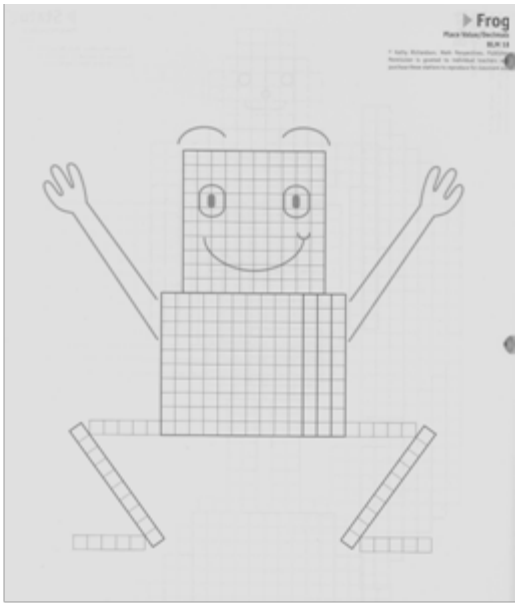
  http://www.ablongman.com/vandewalleseries/Vol_1_BLM_PDFs/BLM19.pdf





GROUPING

Large Group, Individual

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

This task provides an interesting way for students to work with groups of hundreds, tens, and ones. This activity will create a fun interactive way for students to explore what numbers are composed of. This will also give students the opportunity to discover how you write a number that is composed of two tens and eleven ones. Foster the discussion with students on regrouping and what that means for ones, tens, and hundreds.

Part I

1. Provide students with centimeter graph paper. Have students trace the hundreds blocks and tens strips on the graph paper first to be sure they are marking the correct amount of squares. Encourage the children to label each part with its value. Have them cut out the pieces so they can use them to make the animal picture below. (*Tip: Cut out pieces as morning work or the day before activity is to be completed)*

2. Hand each child a copy of the base ten animal pictures. When the students first get their animal, have them predict the "value" of the animal and record their guesses on the board.

3. Have the students recreate it with their pieces and then determine the number of hundreds, tens, and ones used to make the picture. Next have them come up with a total for what the "value" of the animal is; how much it is worth. Allow students to work with a partner if necessary. Make sure to discuss the different strategies students use to determine the total value of the animal. When students are sharing their thinking have them come up and circle the parts they are adding together to show their classmates how they are dealing with (organizing) the numbers in order to reach a total. Hold a discussion with the class about their predictions and what may have created the difference between their actual value and their guess.

4. Have students create a prediction of the "value" of the next animal. Add these predictions to their prior predictions. Discuss what strategies they are using to create a more accurate prediction. Students will find the value of the animal. This creates a good opportunity for the students to math journal their strategy for predicting and their strategies for counting the value.

PART II

1. Once the students are comfortable with how to determine the value of a picture, have the students create a base ten picture of their own using the pieces they made and reorganize/combine them to make new pictures.
2. Provide students with "My Base Ten Picture" recording sheet. Students should record the number of blocks used to make their design in standard and expanded form as well as discuss the difference between place and value.
3. Have students exchange with a partner to determine the value of each picture they make. Encourage them to be creative!

PART III

1. Have the students state the type of animal they created and how that animal travels (runs, swims, flies, etc). Write this information on the board and create a table for the way the animals travel, placing tally marks under each one.
2. Encourage the students to create/draw a bar graph with the information from the board.
3. Have students create at least three questions about their graph and the correct answer.

4. Discuss the data and ask relevant questions such as "How many more animals fly than walk?"

FORMATIVE ASSESMENT QUESTIONS

- How many blocks did you use to create your animal?
- How did you count the number of blocks?
- How many blocks did your partner use?
- Who used the most blocks?
- How could you create an animal to make it easiest to count?
- How did you count the total number used?
- Can you show me this number in standard form?
- What is the number in expanded form?

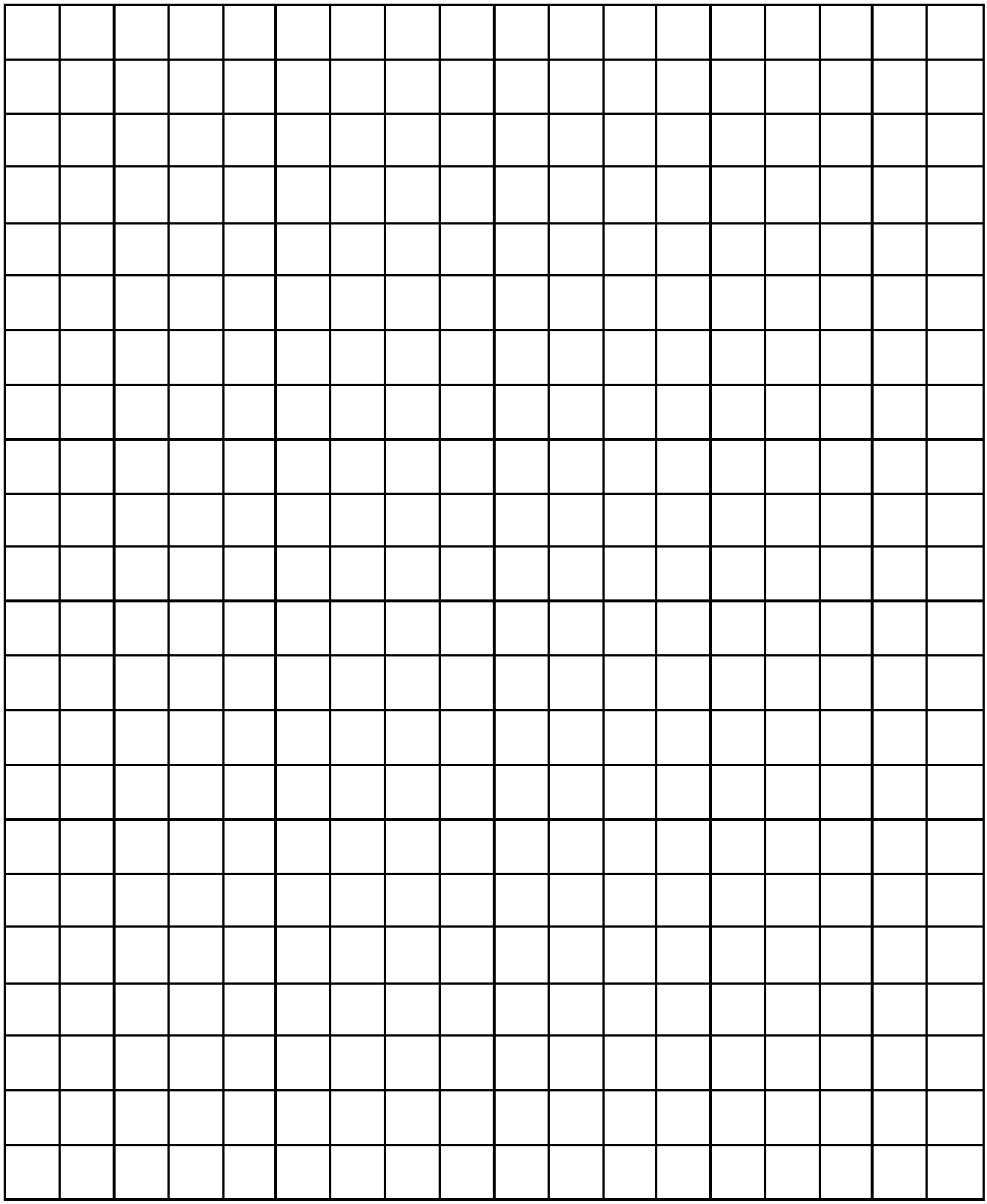
DIFFERENTIATION

Extension

- Have the students determine the money amounts of each of the pieces and then determine how much their picture costs.

Intervention

- Provide sample pictures that the student can recreate with real base ten blocks. The picture can then be labeled with the correct values and then created with centimeter paper.



Base-Ten Picture Recording Sheet

Name:_____

I made a _____.
(name animal)

My design was built with _____ base ten blocks.
(write number)

My number has _____ digits.

Here is my number in expanded form.

_____
(hundreds + tens + ones)

I can represent and show numbers using different models, pictures, or number sentences.

My work shows I understand the value of each digit in my number.

What is the difference between place and value?

_____

_____

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