Subitizing with Dot Cards

Strand: Number and Number Sense

Topic: Composing and Decomposing Numbers to 10

Primary SOL: K.4 The student will
a) recognize and describe with fluency part-whole relationships for numbers up to 5; and
b) investigate and describe part-whole relationships for numbers up to 10.

Related SOL: K.1, K.3a, K.6

Materials

- Cardstock
- Peel-off dot stickers
- Student dot cards (attached)

Vocabulary

number, part, whole, zero (0), one (1), two (2), three (3)

Student/Teacher Actions: What should students be doing? What should teachers be doing?

Note: Prior to instruction, create dot cards for numbers for one to 10 using half sheets of paper or cardstock and peel-off dot stickers or bingo markers. Use common number arrangements such as those on number cubes, dominoes, or 10 frames. Also, use combinations of smaller patterns, as well as patterns with one additional dot to show one more than. The student dot cards included in this lesson can serve as a model for creating the larger cards. However, additional cards can also be created.

Note: Steps 1–9 describe a classroom routine known as a "number talk." Number talks should be done frequently to help children develop flexibility in their thinking about numbers. While this lesson is written to address parts of three, it can (and should) be expanded to address larger numbers to assist in part-whole fluency.

1. Call students together. Explain that a card with dots will be shown and students are to give a thumbs-up when they know what number has been displayed.
2. Display the dot card that represents number 3, with two dots on top and one on the bottom. This should be done quickly the first time. Only show the card for about 3 seconds, then hide it. Allow students to show thumbs.
3. Call on multiple students. Do not correct or praise responses.
4. Tell students that you are going to display the card again, only quicker this time, if they would like to revise their answer. Flash the card and allow students to show thumbs.
5. Call on multiple students again. Do not correct or praise responses.
6. Display the card again, but do not hide it. Call on students to explain what they see. Ask questions such as, "*Can you tell me how you saw three?"* Students may respond with "Two on the top, one on the bottom" or "one on the top, two on the bottom,"

depending on the card's image. This is the beginning of understanding that two and one make three. Restate students' responses and ask others to do the same.

7. Ask students whether anyone saw it a different way. Students may say things like, "I just saw three," "I saw one and one and one," "I counted one, two, three," or "I saw an upside-down triangle." Accept and discuss their ideas.
8. Explain that another dot card will be displayed. This time, display the card that represents 3, with one dot on top and two on the bottom. Again, display for about 3 seconds and repeat steps 3–7.
9. Guide students to the conclusion that various combinations can represent the same number. Remember, in kindergarten, we should always be saying "__ and __ make __." We do not want students rushing into the symbolism of "+" and "-" but rather gaining a deeper understanding of number sense and what makes up a number.
10. Put students in pairs or small groups. Give each group a set of dot cards. Limit the set to cards showing one to five dots. Ask students to find all the cards that show 3 and then describe how they see 3 on each of them. As students are working, observe to see which children are counting to find the cards that show three and which children are subitizing. Ask: *How did you know that was three?* Again, encourage responses such as "2 on one side, 1 on the other" to encourage part-whole fluency. Keep in mind that writing the numerals ("2 and 1") would not be required early on in the year, but expectations may be increased as students show readiness.
11. Bring students together as a whole group after the small-group activity. Debrief using the questions below.
12. Continue this activity on subsequent days, gradually introducing larger totals as students begin to develop fluency with the various parts for each whole. As students build familiarity, begin using the words *part* and *whole* when clarifying student responses. Be sure to provide opportunities for children to see zero as a part (i.e., "Zero and three make three.").

Assessment

- **Questions**
  - Tell me how you saw 3 today.
  - We saw 3 in different ways today. Can you think of any other ways to represent 3?
- **Journal/writing prompts**
  - Draw pictures to represent the number 3.
  - There were two apples in a tree and one apple on the ground. Create a dot card of your own to represent the picture.
- **Other Assessments**
  - Record student responses, revisions and clarifications.
  - Tell the student how many dots are on a card. Then show the card, but cover some of the dots with your hand. Ask: "How many dots are covered?" Students who quickly know how many dots are covered have developed fluency. Students who must figure it out need continued opportunities to develop fluency.

Extensions and Connections (for all students)

- Have students act out the representation shown by the dot card/plate (i.e., two students stand together and one student stands apart.).
- When working with higher numbers, additional attempts for revision may be necessary.
- Display dots in a five frame or 10 frame once the concept is more familiar.
- Use a beaded number frame to represent numbers as another tool for encouraging students to see numbers in parts.
- Once students are quite familiar with the process, dot cards may be used in a student-led center, following the same outline.
- Dominoes, playing cards, and standard number cubes all have representations of common spatial arrangements for numbers. Multiple experiences with each of these help develop students' abilities to subitize.

Strategies for Differentiation

- For students requiring additional support, offer additional viewing time as needed.
- For English language learners (ELLs), as students describe what they see, display the numerals to represent the parts and the whole.
- Allow students to draw representations of what they see on a white board.

The following pages are intended for classroom use for students as a visual aid to learning.

Student Dot Cards