SCAFFOLDING TASK: Got Dots? (0-10)

This task contains numerous activities where students can engage using the different representations of numbers. (Adapted from VdW Backline Masters)

STANDARDS FOR MATHEMATICAL CONTENT

MCC.K.CC.1 Count to 100 by ones and by tens.

MCC.K.CC.2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

MCC.K.CC.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

MCC.K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality.

a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
c. Understand that each successive number name refers to a quantity that is one larger.

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.

BACKGROUND KNOWLEDGE

This task contains numerous activities where students engage in subitizing activities. Subitizing introduces basic ideas of cardinality- "how many", ideas of "more" and "less," ideas of parts and wholes and their relationships, beginning arithmetic, and, in general, ideas of quantity. Developed well, these are related, forming webs of connected ideas that are the building blocks of mathematics through elementary, middle, and high school, and beyond. (Clementes & Sarama, *Learning and Teaching Early Math*, 2009)

The subitizing of quantities can be achieved with dot cards, ten frames, and base-ten manipulatives later on. Using recognizable patterns like the ones found on dice are patterns that are instantly recognizable to most kindergarten students to game play. Many of the tasks

included throughout this unit involving subitizing and dot cards should be continued throughout the year.

ESSENTIAL QUESTIONS

- Why do we need to be able to count objects?
- How do we use numbers every day?
- How do we use counting in our everyday life?
- How can you know an amount without counting each object?

MATERIALS

- Dot cards (recommend printing multiple sets of cards on tag board and laminating)

GROUPING

Whole group and partner task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

- **Dot Flash:** Teacher/Student flashes a dot card to class/partner and quickly covers it up. Students must say the quantity of dots they saw and describe how they know what they saw. Example: I saw 4 dots because I saw a group of 3 dots and there was one left over to make 4. The difficulty in the game can be increased by the amount of time that the dots are shown to students.

- **Count 'Em:** a card is turned over. The first player to say the quantity of dots on the cards keeps that card. Partner must count the dots on the card to verify. No assuming.

- **One More/Less:** same as dot flash but students need to say either 1 more or less than the dots on the card. Whether it is more or less must be established before the game begins.

- **Who Has More/Less/Same?:** 2 players turn over 1 card at the same time. The first player to identify which card has more/less/same keeps the 2 cards.

- **Line 'Em Up:** give a student a set of cards and have them line the cards up in a specific order. (least to greatest – forward counting sequence, greatest to least-backward counting sequence)

Kindergarten students are extremely creative and continuously invent new games. Have students create a game using the cards and share with classmates. Van de Walle's *Teaching Student Centered Mathematics k*-3, lists numerous ways to incorporate subitizing activities into the classroom. A greater variety of dot cards and dot plates can be found online and Van de Walle's Blackline Masters Series at http://www.ablongman.com/vandewalleseries/volume_1.html. In addition Van de Walle suggests numerous ways that activities and tasks can be repeated throughout the school year as centers or stations.

FORMATIVE ASSESSMENT QUESTIONS

- How do you know that you counted correctly?
- How many dots did you see?
- How do you know?
- What way did you see the dots grouped together?
- How many dots away from 5 is 8? How many dots would you need to make 10? (anchoring 5&10)

DIFFERENTIATION

Extension and Intervention

- Increasing or decreasing the quantity of dots on a card can help with differentiating subitizing