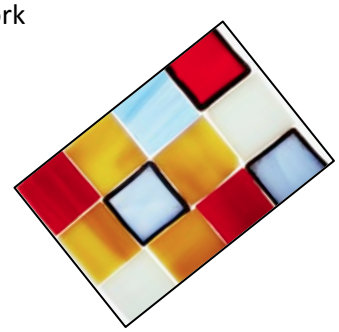

Scaffolding Task: Bumpy or Not Bumpy

Approximately 2 days (Activity originally found in Van de Walle and Lovin, Teaching Student-Centered Mathematics: Grades K-3, page 292)

STANDARDS FOR MATHEMATICAL CONTENT

MCC2.OA.3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

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, page 291)

"The categorization of numbers as odd or even is an important regularity in our number system. All too often students are simply told that the even numbers are those that end in 0, 2, 4, 6, or 8 and odd numbers are those that end in 1, 3, 5, 7, or 9. While of course this is true, it is only an attribute of even and odd numbers rather than a definition that explains what *even* or *not even* (i.e., *odd*) really means."

After concluding the Bumpy or Not Bumpy Task, "students should be able to classify numbers into the categories that we call odd and even. **After they have conceptualized these classes of numbers**, the appropriate labels of *odd* and *even* can be applied."

ESSENTIAL QUESTIONS

- How do I determine if a number is odd or even?
- What strategies can I use to tell if a number is odd or even?
- What is odd? What is even?

MATERIALS

- Bumpy or Not Bumpy Blackline Master

- Paper, crayons, pencils
- Envelop

GROUPING

Small Group, pairs

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Special Note: This task can be repeated several times in small groups or in a center.

Part I
Duplicate the Bumpy or Not Bumpy Blackline Master for each student. Have students cut them and keep them in an envelope. Explain how each piece (except the single square) is made of two columns of squares. Have students work in pairs or small groups to see how many things they can find to tell about the pieces. (For example: There is a piece for each number 1 to 10. Some are like rectangles. Some have a square sticking out.) For those who might need a start, suggest that they put the pieces in order from one square to ten. Have students share with the whole group what they have discovered.

Part II
Next, have students sort their pieces into two sets. It is very likely that some group will sort their pieces into "bumpy" (odd) and "not bumpy" (even). Refer to the two groups of pieces as "bumpy" numbers and "not bumpy" numbers (or whatever labels your students prefer to use). Students will then share their groupings with their classmates and have the class guess what rule they used to categorize the pieces.

Part III
Next, assign groups of students three or four numbers between 11 and 40 or 50 and have them decide whether two-column cards for these numbers would be bumpy or not bumpy. They can use words and pictures to explain their conclusions.

FORMATIVE ASSESSMENT QUESTIONS

- What did you notice about your pieces?
- How do the pieces differ from each other? What do the pieces have in common?
- What characteristics did you use to sort your pieces?

DIFFERENTIATION

Extension

- Have students create their own pieces to represent various numbers. Then trade their pieces with a classmate and they will describe the pieces a "bumpy" or "not bumpy".

Intervention

- Have students use unifix or connecting cubes to build each piece. The can then manipulate the pieces to pair up each square. This will help then to better understand the meaning of "bumpy" and "not bumpy"

Bumpy or Not Bumpy Blackline Master