BEAN MATH

Materials:
20 manipulatives (beans) and 10 index cards for each pair of students. Real beans are great if you can get them.

Beans Between

Odd and Even Numbers (2nd grade)

Preparation:
Divide students into pairs and give each pair a set of twenty beans, two index cards, and a piece of paper. Have the students draw a line down the middle of the paper and write "Odd" on one side and "Even" on the other. Then have each student write his/her name on an index card and fold it over so it stands like a place setting. Count out ten beans.

Activity:
Have the students divide the ten beans between them, one bean at a time. They should make two piles, one in front of each place card. When all the beans have been divided, have them check to see if the two piles have the same number of beans. If they do, the number (in this case 10) is even, and they should write it in the "Even" column on their paper. Otherwise, they should write it in the "Odd" column. Repeat this with eleven beans, then twelve, all the way to twenty.

When the students have tried all the different combinations, have them look for patterns in the numbers they wrote. (Odd and even numbers alternate, even numbers end in 0, 2,4,6,8, etc.)

Bean Fifteen

Dividing, remainders, factors (3rd Grade)

Preparation:
Divide students into pairs and give each pair a set of fifteen beans and a stack of index cards. Then have each student write his/her name on an index card and fold it over so it stands like a place setting.

Activity:
For this project, students act out the plot of Bean Thirteen, but this time with fifteen beans. Select one of each pair of students to be the first "guest". If there is only one person at the party, how many beans would he/she get? Have the student write the division fact on the back of his/her place card (15 ÷ 1 = 15).

Next, add another guest (the other student in the pair) to the party. Divide the beans again. How many beans would each guest get? Are there any left over? Write this fact on the back of the second guest's card (15 ÷ 2 = 7 R 1)

Now the students can alternate, pretending to invite other guests to the party (friends, relatives, celebrities, etc.) Each time they add a guest, they should make a place card, divide the beans, and write the division fact on the back. Repeat this, continuing to add another guest each time.

When the students have tried all the combinations, have them look for patterns. The cards that don't have remainders will be factors of fifteen. (Of course, this project can also be done with a different number of beans; prime numbers will produce no factors other than one, numbers like twelve will produce many.)

Find the Primes

Dividing, remainders, factors, prime and composite numbers (4th Grade)

This activity is the same as "Bean Fifteen" above, except each pair of students works with a different number of beans (10, 11, 12, etc.) Each pair should invite at least half as many guests as they have beans. In the end, some pairs will find that no matter how many guests they invite, they always have at least one bean left over. These are the prime numbers. For the rest of the students, the cards that don't have remainders are the factors of their composite number. In the end, have the different groups report their results to the class.

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