

FRACTION OF A NUMBER

Performance Standard 6B.F

Demonstrate the meaning of multiplying fractions using color tiles accordingly:

- *Mathematical knowledge:* Multiply all possible fractions times 12, 20 and 24 that result in a whole number answer; know how to represent the multiplication function by “of” or “x” (times sign).
- *Strategic knowledge:* Use appropriate strategies to demonstrate the meaning of multiplication of fractions.
- *Explanation:* Explain completely and clearly what was done and why it was done.

Procedures

1. *In order to investigate, represent, and solve problems using number facts, operations and their properties, algorithms, and relationships (6B)*, students should experience sufficient learning opportunities to develop the following:
 - Demonstrate the meaning of multiplication of fractions.
2. Provide each student 40 color tiles. Have students review and discuss the task to be completed and how the rubric will be used to evaluate it.
3. Have students count out 12 tiles and put the others aside and do the following:
 - Show $\frac{1}{2}$ of 12. Write this on the board or overhead. They should divide the group of tiles in half with 6 tiles in each group. Discuss ways to arrange the tiles so it's easy to see they are divided in half.
 - Show $\frac{1}{3}$ of 12, then $\frac{1}{6}$ of 12, and finally $\frac{3}{4}$ of 12. Write it and then circulate to see each display. Each time discuss the displays and how the students decide what to display.
4. Now change the number of tiles to 20. Ask for $\frac{1}{4}$, $\frac{1}{5}$, $\frac{4}{5}$, and so on.
5. Change the number of tiles again to 24. Ask for $\frac{1}{8}$ of 24, $\frac{5}{6}$ and so on.
6. Discuss what you might use instead of the word of in the number sentences you have written on the board. Substitute a multiplication sign and then have students write how they would solve $\frac{1}{5} \times 30$ without tiles. Then have the students write their strategy for solving $\frac{1}{5} \times 24$.
7. Evaluate each student's performance on the rubric and use its guide to determine the performance level. As you walk around, observe the students and arrangements of the tiles. Assess whether they see that the denominator of the fraction tells them how many groups to put the tiles in and then the tiles are divided evenly into that number of groups. The number in each group is the product of multiplying a fraction times a whole number.

Examples of Student Work follow

Resources

- 40 color tiles for each student
- Mathematics Rubric

Time Requirements

- One class period

ASSESSMENT 6B.F

1/5 of
30 =

$$\frac{1}{5} * \frac{30}{1} = \frac{30}{5} \text{ or } 6$$

#1

First I took $\frac{1}{5}$ + multiplied it by $\frac{30}{1}$. (of = multiply) Then I multiplied $1 * 30 = 30$, $5 * 1 = 5$. finally answer of $\frac{30}{5}$. $\frac{30}{5}$ is an improper fraction so I reduced it into a whole number by figuring how many times five goes into 30, which is 6. $6 * 5 = 30$.

1/5 of
24 =

$$\frac{1}{5} * \frac{24}{1} = \frac{24}{5} \ 4\frac{4}{5}$$

#2

I started out with the same procedure then from #1. The only problem is 5 doesn't go into 24 evenly. It goes into 24 4 times, (20) that's how I got the 4. ~~(4*)~~ there are 24 tiles + since I only got to 20 with 5 there were 4 left over. That is how I got $\frac{4}{5}$. $4\frac{4}{5}$

$$\frac{1}{5} * \frac{24}{1} = 4\frac{4}{5}$$

$$\frac{1}{5} * \frac{30}{1} = \frac{30}{5} = 6$$

multiply
1 * 30 &
5 * 1

I got that answer by multiplying $\frac{1}{5} * \frac{30}{1}$ which is $\frac{30}{5}$. Then I divided $30 \div 5$ so it could be in its lowest terms & the answer I got was 6.

$$\frac{1}{5} * \frac{24}{1} = \frac{24}{5} = 4\frac{4}{5}$$

I got that answer by multiplying denominator by the other denominator & numerator by the other numerator: $\frac{1}{5} * \frac{24}{1}$. I had to put 24 over 1, because 24 didn't have a fraction so you just use 1 since there is only one 24. The answer I got was $\frac{24}{5}$. Then I had to divide $24 \div 5$ and 5 couldn't go into 24 evenly so it became a mixed number, $4\frac{4}{5}$. And $\frac{4}{5}$ was in its lowest terms. That's the easiest way to get my answer.