

#473 Perkowski/Lannin

**Making, Generalizing, and Justifying Conjectures about Number and Operations**

**Four Justifications for  $3/4 = 6/8$**

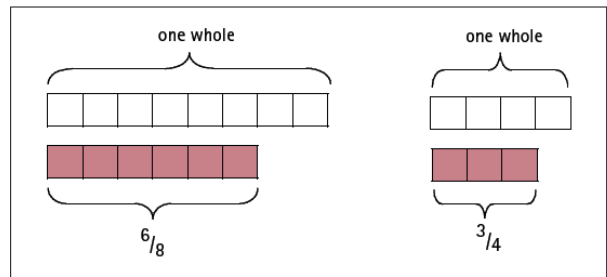
Decide which of these justifications are valid and which are not. Why do you think so?

Abby's Justification

To show the two fractions are equivalent, look at  $3/4$  and  $6/8$ . Three-fourths is equivalent to  $6/8$ , because you can divide the numerator and denominator for  $6/8$  by 2, making  $3/4$  the same number as  $6/8$ . You can do this for any two fractions.

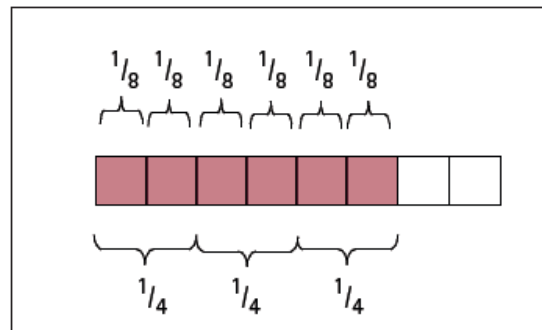
Briana's Justification

Two fractions are equivalent when you can divide one fraction by something to make the other fraction. Three-fourths is equivalent to  $6/8$  because you can divide  $6/8$  in half to make  $3/4$ . See my picture where  $6/8$  divided by 2, or cut in half, is the same as  $3/4$ .



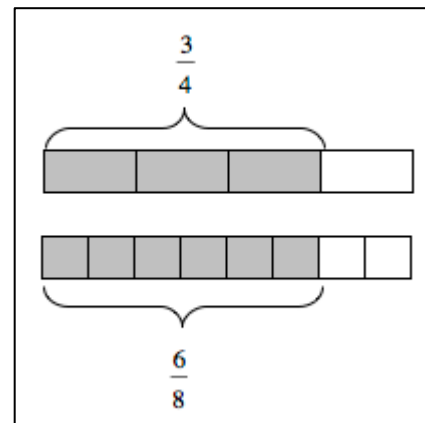
Candy's Justification

Three-fourths is equivalent to  $6/8$  because if you draw both pictures you can see that two of the eighths is the same as one-fourth. So you can see that the shaded  $3/4$  is the same as  $6/8$ . See my picture below. For equivalent fractions, you can always split parts to generate the same fraction. For example,  $3/4$  is the same as  $6/8$  because you can split each of the fourths into two parts, making eighths.



Debbie's Justification

Three-fourths is equivalent to  $6/8$  because if you draw both pictures  $6/8$  looks like it is the same as  $3/4$ .



## Discussion Activity

The problems below come from a variety of topics in Grades 3-5. Discuss how a teacher could revise or extend them (if necessary) to encourage students to make conjectures, generalize, and justify.

1. Fill in the blanks with the correct symbols ( $>$ ,  $=$ , or  $<$ ):

(a)  $\frac{5}{9} \square \frac{7}{9}$

(b)  $\frac{3}{5} \square \frac{12}{20}$

(c)  $\frac{7}{15} \square \frac{7}{16}$

2. Compute the following:

(a)  $2 \times \frac{1}{5}$

(b)  $\frac{1}{3} \times \frac{1}{5}$

(c)  $\frac{2}{3} \times \frac{1}{5}$

3. Brandon used his calculator to multiply  $\frac{19}{18}$  by 6000 and got  $5333.\bar{3}$ . Does that answer seem reasonable? Why or why not?

### Key Components of Reasoning

