Multiplication and Division of Fractions

1. Recall that Equal Groups problems have the following structure:

   number of groups $\times$ *group size* = *total* (or *product*)

   Write an Equal Groups multiplication problem for $5\times\frac{2}{3}$. Why does multiplying a fraction by a whole number present a good entry to fraction multiplication for students?

2. Write a multiplication problem for $\frac{2}{3}\times 5$, where 5 is the *group size* and $\frac{2}{3}$ is the *number of groups*. How does this connect to the idea $\frac{2}{3}$ *of* 5? How does this differ from the structure of the problem you wrote above?

3. Write an Equal Groups multiplication problem for $\frac{3}{4}\times\frac{5}{6}$. Illustrate the solution with an area model. How can you coordinate the understandings of *group size* and *number of groups* from the previous two problems to explain the meaning of this multiplication problem. How does the area model connect to the multiplication algorithm for fractions?

4. Consider the following progression of division problems:
   A. Matt has 6 feet of ribbon. If it takes 2 feet of ribbon to make one bow, how many bows can he make?
   B. Matt has 7 feet of ribbon. If it takes 2 feet of ribbon to make one bow, how many bows can he make?
   C. Matt has $7\frac{1}{2}$ feet of ribbon. If it takes $1\frac{1}{2}$ feet of ribbon to make one bow, how many bows can he make?

5. What part of the Equal Groups problem is unknown in each of the problems in the above exercise?

6. Create a similar progression of division problems that would help students divide $2\frac{2}{3}\div\frac{4}{3}$.

7. Is it necessary to invert and multiply to solve any of these division problems? What attributes of these problems make that algorithm unnecessary?