# CONSTRUCTIVE RATIONAL NUMBER TASKS

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*The following are the first of a series of number tasks to be published in* delta-k.

## FRACTION TASK 1: Measurement and Partitioning

1. Take a piece of calculator tape and "work it" until it lays flat rather than curling up. Cut the ends so that they are perpendicular to its length.

2. Consider your piece of tape as a *unit*. Use your unit to measure the following objects:

   table __________units

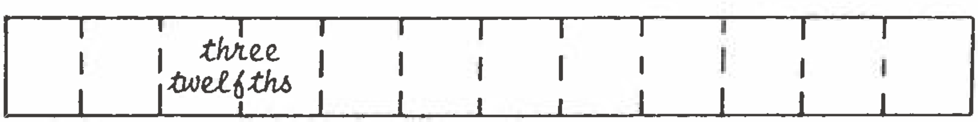
   book __________units

   your partner's height __________units

   your waist __________units

   Because your unit will not usually fit "evenly," you must subdivide your unit into 2, 3, 4, 6, 8, 12, 16 ... parts. You can do this by folding your tape appropriately. (For example, how can you fold "thirds"?) Write the names of the division lines on your tape.

   EXAMPLE:




   Make the measurements using your divided tape.

3. What do you do if your divisions don't give you an even measure? Why can you always find numbers to represent your repeated partitions?

4. This activity is done to answer the following questions.

   (a) Are fractional numbers always less than one?

(b) Counting is a useful mechanism in understanding whole numbers. What mechanism appears useful in understanding fractions?

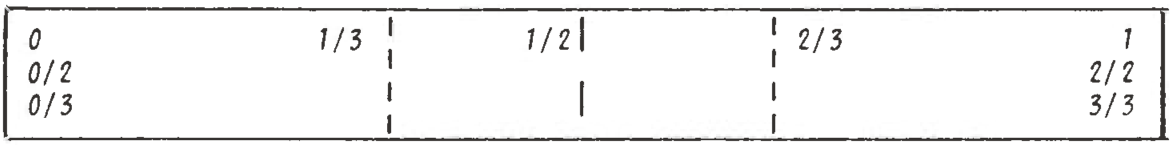
## *FRACTION TASK 2A: Measurement, Order, and Equivalence*

1. Take a piece of calculator tape about 1 metre long and work it until it lays flat. Cut the ends perpendicular to the length and make them straight. Label the ends 0 and 1 right at the top of the tape.

2. Fold the tape lengthwise in two equal parts. Label as follows:


Because of space limitations you will want to use the formal forms 0/2, 1/2, 2/2, but *remember* - as children learn fractions, start with *word names first* and only later use ordered pairs of numbers.

3. Fold the tape lengthwise in three equal parts. Think before you act and *do it carefully*. Label the folds on the tape as follows:




4. Fold the tape into 6 equal parts, label the ends and the "sixths" folds appropriately. (Remember to add the label "2/6" to the "1/3" fold, et cetera.)

5. Fold the tape in 12 equal parts. Label the ends and the "twelfths" folds. (Remember to label the "2/3" fold with "8/12," et cetera.)

6. Fold the tape in 4 equal parts. Label as above.
   Fold the tape in 8 equal parts. Label as above.

7. Is 5/8 greater than 7/12? How can you tell?
   Make up a half-dozen ordering tasks using your tape.

8. List the fractions on the "1/2" fold.

   1/2, 2/4, ____, ____, ____, ____, ____, ____.

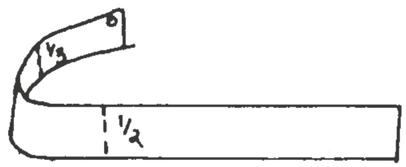
   What can we say about these fractions?
   Why are there no "thirds" in this list?
   Give other sets of equivalent fractions from your tape.

9. How could you generate other fractions to go on the "7/12" fold?

## FRACTION TASK 2B:
## Meaning of Addition and Measurement

1. Take your tape from task 2A. Hold the "1/3" fold directly on the "1/2" fold.

   Where does the "zero" end lie?




   Why?

   A mathematical sentence to describe this is:

   1/3 + 1/2 = 5/6

2. Repeat 1 above, but fold 1/3 on 7/12. Write the appropriate mathematical sentence.

   1/3 + ____ = ____.

   Do other "additions" using your tape.

   Can you "add" fractions without like denominators?

3. What happens if you lay the "2/3" fold on the "5/6" fold?

   Can you figure out how much beyond 1 the tape extends?

   Complete this mathematical sentence

   2/3 + 5/6 = 1 ____

4. Using the tape, do other additions whose sum is greater than 1. Write the related mathematical sentences.

5. Using your tape (and imagination) to solve the following:

   1/3 + ____ = 5/6      ____ + 1/12 = 11/12      5/8 + 1/2 = ____

6. Think up a way to show subtraction using your tape.