Creating Fraction Strips *(Teacher Directions)*

Materials (per student):
Scissors
Ruler
Coloured construction paper (one colour per fraction)
- Ensure that the length of each strip allows for multiple fraction representations. For example, lengths of 24cm or 30cm are best (as both numbers have multiple factors, thus can be used to multiple sets of fractions).
- Specifically, factors of 24 include 2, 3, 4, 6, 8, 12 and 24. Therefore, 24cm strips can be used to create halves, thirds, fourths, sixths, eighths, and twelfths.
- If the strip length is, for example, 17cm, students cannot easily use a ruler to create thirds (17cm ÷ 3) or other fractional parts.

Remember to pay attention to "the wording" of the directions. Also, ensure that all students use the same colour strip for each fraction created (although they do not need to be the same colours as described below).

Instruction:

1. Instruct students to hold up the blue strip. Tell students that this strip will represent "one whole". Ask students to write "1" on the strip; and then write "one whole" in words on the other side of the strip.

2. Next, instruct students to take the purple strip and fold it into "two equal pieces" (remind them to complete a "hamburger fold" not a "hotdog fold") and then cut along the fold.

   a. Ask students: "How many purple pieces do you now have?" (2).

   b. Ask them to hold up one of the purple pieces. Then ask: "How many pieces are you holding up? (1)"; "How many purple pieces are there all together?" (2).

   c. Then, restate: "So, you are holding up one part of two purple pieces?" "Great, so we call that 1 out of 2 **OR** half".

   d. Instruct students to write the symbolic and the word representations on opposite sides of the fraction strip (e.g., "½" **and** "half")

3. Instruct students to take the green strip and fold it into four equal pieces, and then cut along each fold line.

   a. When students have the four equal pieces, discuss "how" they created the four pieces. For example, some students will fold the strip in half and then in half again; while others will fold the strip in half, cut it and then fold each of the two pieces in half.

   b. When students have created the four equal pieces; ask them to hold up one piece and prompt them to answer the questions as presented in the "half" strip.

   c. Depending on the grade level, you may wish to include the following "observation/discussion" concerning how they created the fourths: "So, to create the fourths, you folded the strip in half and then in half again?" … "Interesting, so you are telling me that ½ of a ½ is ¼?" Students may not be able to process this idea; however, it is important for the teacher to understand that the "folding process" represent "multiplication of ½ x ½).

4. Instruct students to take the green strip and fold it into *three equal pieces*. Cut along each fold; and label each pieces (words and symbols).
   a. Remember to have extra green strips as students will struggle with creating three equal pieces.
   b. If students are having difficulty, encourage them to use the rulers to help. Do not tell them how to use the ruler, simply point out that the tool is available and they may find it helpful.
   c. Note that each strip is either 24cm or 30cm (as highlighted on page 1); thus to create thirds they simply need to divide 24 or 30 by 3; resulting in thirds that measure either 8cm or 10cm in length.

   d. Continue the folding, cutting, labelling process creating, some or all of the following fraction pieces: Fifths, sixths, and eighths.

   e. Once students have created their "fraction kits", provide them with envelopes to store their fraction pieces.

5. Ask students various questions to help them develop an understanding of the relative size of fractions; including ordering and comparing fractions. Many students find it helpful to have the "one whole" strip displayed on their desks. It is also important to introduce addition and subtraction as students compare fractions. For example, ask some of the following questions:
   a. *Which is greater ½ or 1/3? How do you know? How can you prove this? (Students simply show the two fractional pieces; one above the other. The "proof" is in the manipulative).*
   b. *Which is greater 2/3 or 5/6? How do you know? How much greater is 5/6? (Students search for the "missing piece")*

   c. Encourage students to "hunt for the missing piece" (1/6) that will fit "perfectly" into the empty space. Extend students' thinking, by asking: "So, how much greater is 5/6 than 2/3?" (1/6). "How much less is 2/3?" (1/6). Encourage them to write an "addition sentence" and a "subtraction sentence" to describe the relationship between 5/6 and 2/3.
      i. 2/3 + 1/6 = 5/6
      ii. 5/6 − 1/6 = 2/3
   d. Encourage students to talk about anything else they might notice about thirds and sixths. Specifically, encourage them to illustrate equivalent fractions (e.g 2/6 = 1/3 OR 4/6 = 2/3).

There a number of other questions that can be asked using the student created "fraction kits"; however note that the fraction sizes may not be accurate as student folding and cutting are not "precise". Thus, it is important to use the "pre-made" kits as you begin to explore fractions in greater detail.

Finally, it is essential that you create your questions and complete each question using the fraction strip kit prior to presenting the questions to your class. Ensure that each question you create can be answered using the manipulatives. For example, although you can ask students to compare 2/3 and 2/5, you cannot ask them *"how much larger"* as the kit does not have the "missing pieces" (e.g. fifteenths fractional pieces).