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Building Fraction Sense Using "Fractions Intro PhET Simulation"

By the end of this lesson, you will be able to:

- Identify parts of a fraction and explain similarities and differences between types of fractions.
- Represent fractions through a variety of different representations.

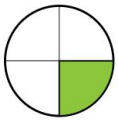
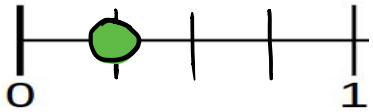
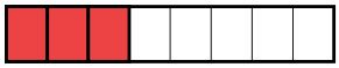
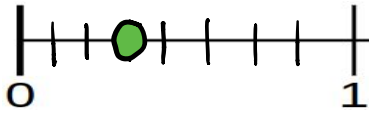
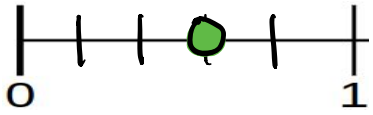
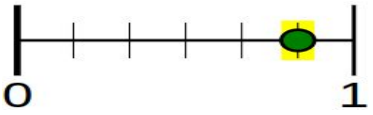
1. Go to https://phet.colorado.edu/en/simulation/fractions-intro. Play with the *Intro* tab for 5 minutes.
   Write down at least three things that you observed.
   - There's a lot of buttons
   - You can change the numerator and denometer to change the fractions
   - When you change the fractions it interacts with the visuals
   - Max adjusts total # of shapes
   - Coloured pieces = numerator
   - different models available

2. Fill out the table with your observations.

What happens when you change the **numerator** (top number) of the fraction?	What happens when you change the **denominator** (bottom number) of the fraction?
It makes the fraction bigger or smaller: adds more pieces to the diagram	It divides the pieces into smaller or larger fragments.

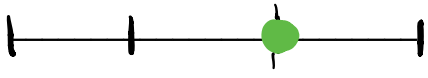
AND

3. Use the Fractions Intro Simulation to fill out the missing information.

	Circle	Rectangle	Number Line	Proper Fraction
a.				$\frac{1}{4}$
b.				$\frac{3}{8}$
c.				$\frac{3}{5}$
d.				$\frac{5}{6}$

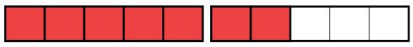
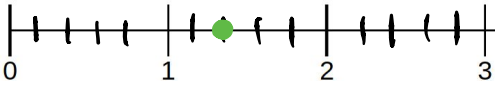
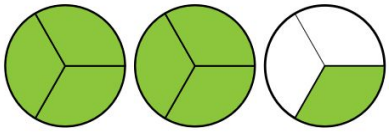
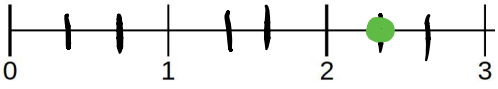
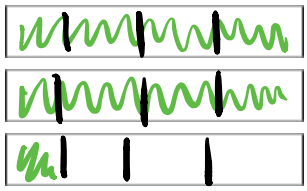
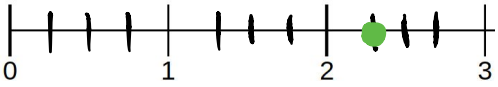
4. In the table above, label the **largest** and **smallest** fraction. Explain how you know.
   largest = d
   Smallest = a
   d fills out the most of all the diagrams, while a fills out the least.

5. Describe in words and then show how you can put $\frac{2}{3}$ fraction on a numberline.
   You put 4 lines on the number lines then mark the 1st one as or "0" and the last one as "1", then put the dot on the line closest to 1.



AND

6. Use the Fractions Intro Simulation to fill out the missing information.
Make sure that you click the "Mixed Number" checkbox on the simulation.

	Circle/Rectangle	Number Line	Improper Fraction	Mixed Number
a.			$\frac{7}{5}$	$1\frac{2}{5}$
b.			$\frac{7}{3}$	$2\frac{1}{3}$
c.			$\frac{5}{2}$	$2\frac{1}{2}$
d.			$\frac{9}{4}$	$2\frac{1}{4}$

AND

7. Discuss the following with your partner/group and write down your ideas.

a. What are the similarities and differences between a *proper* and *improper fraction*? (Look at Tables 1 and 2)

Similarities	Differences
• they are fractions • they show parts of a whole • they have a numerator AND a denometer • same denomanator	• Improper fraction -> numberator is greater than denomenator • Improper fraction has whole numbers

b. What are the similarities and differences between an *improper fraction* and a *mixed number*? (Table 2)

Similarities	Differences
• They show wholes alongside the fraction • they have a numerator AND a denometer	• Improper -> shows wholes in the actual fraction • Mixed -> shows wholes as a number beside fraction

c. How would you convert $2\frac{3}{5}$ to an improper fraction?

$2 \times 5 = 10$
$10 + 3 = 13$ } $\frac{13}{5}$

d. How would you convert $\frac{13}{5}$ to a mixed number?

$10 \div 5 = 2$
3 left over } $2\frac{3}{5}$

How many times 5 goes into 13?
-> 2 times!