Name: _____
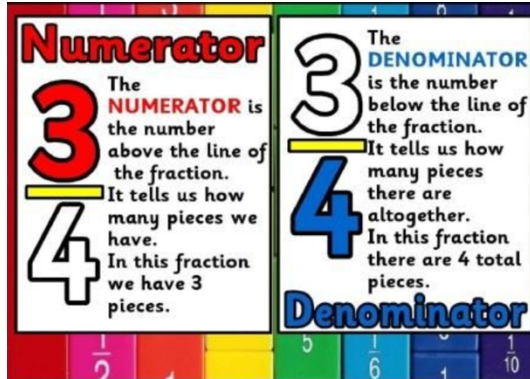
Equivalent Fractions

Fraction Vocabulary:

Learning Goals:
1. Compare fractions with different numerators and denominators.
2. Recognize equivalent fractions.
3. Generate equivalent fractions.
4. Explain how two fractions with different numerators and denominators can be equivalent.

Instructions:

In this activity we will compare different fractions. Complete this packet by filling in fractions and writing complete answers.

This fraction investigation will have three phases:
- Exploration
- Explanation
- Challenge

Procedure:

We will be exploring how to recognize and generate equivalent fractions using a computer simulation. The simulation changes numerators and denominators of fractions in order to make them equivalent.

1. To access the equivalent fraction simulation:
   a. Type this website into your web browser: **phet.colorado.edu**
   b. In the search bar type: **Fractions: Equality (simulation)**
   c. Click on the **play** button.

d. Select "**Equality Lab**."
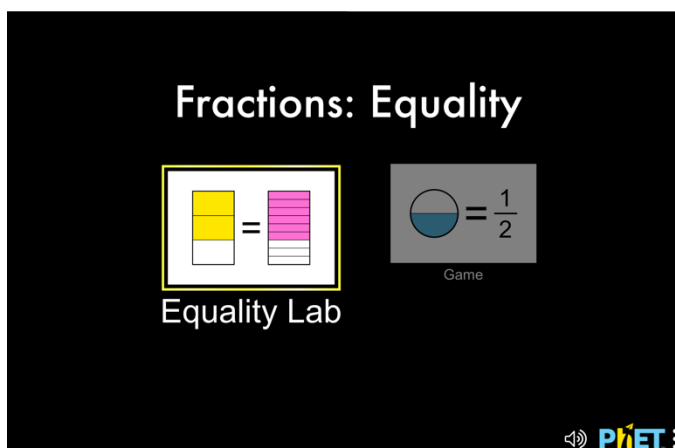
2. Your computer screen should now look like this. Take a moment to examine the different parts of the simulation before you explore.

Explore:

3. Use the yellow up arrow next to the denominator of the 1st fraction to change the denominator of the 1st fraction to 2. Record the new denominator of the 2nd fraction below:

_____

4. Using the green semi-circles on the left of the screen, drag one circle into *one* of the four pies above. Record the two fractions created below:

_____ = _____

5. Use the yellow up arrow next to the denominator of the 1st fraction to change the denominator of the 1st fraction to 3. Record the new denominator of the 2nd fraction below:

_____

6. Using the green semi-circles on the left of the screen, drag one circle into the *same pie* as you did in step 4 above. Record the two fractions created below:

_____ = _____

7. Repeat step 6. Record the two fractions created below:

_____ = _____

8. Describe what you notice about Fraction 2 when the denominator of Fraction 1 changes.

_____

_____

_____

9. Describe what you notice about Fraction 2 when the numerator of Fraction 1 changes.

_____

_____

_____

Explain:

10. ***Equivalent fractions*** are fractions with different numerators and denominators that represent the same value or part of the whole.

      Example: For Step 4 when you moved one semi circle above the fraction ½, the 2nd fraction became 2/4. ½ and 2/4 both represent half of the whole.
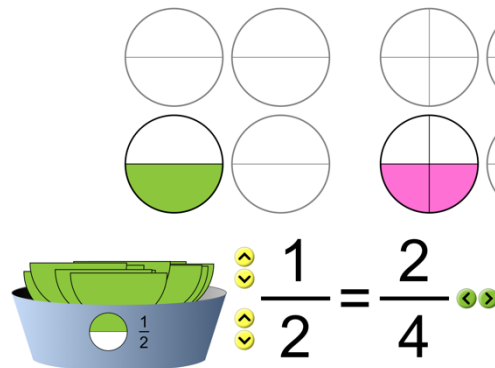
11. Press the orange circle to reset your screen. Use the yellow up and down arrows on your screen to make the first fraction ½ again. Drag one pie piece into one of the circles above.

12. Click the number line button next to the pink circle at the top of your screen. Mark the number line below to match your screen.
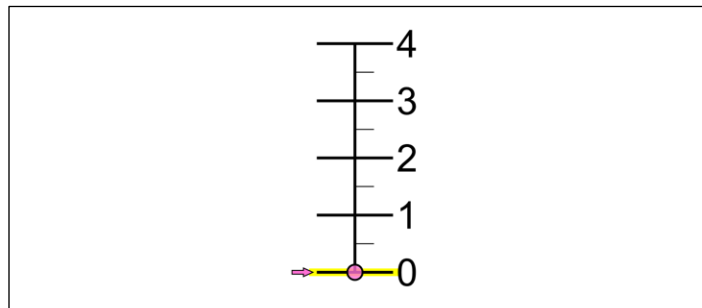

Explain:

     The fraction ½ and the fraction 2/4 both fall half way between 0 and 1. They represent the same part of one whole. They are equivalent fractions.

Directions: For the next questions, predict the equivalent fractions by filling in the diagrams. Use the simulation to confirm your predictions. Record the equivalent fractions in the provided space.

13. Use the orange reset button at the bottom right of your screen to reset the model. Now, use the yellow up arrow to change the denominator of the first fraction to 4.

Using a crayon, fill in two sections of the first pie below. Fill in the correct number of sections for the 2nd pie to make it an equivalent fraction to the first.
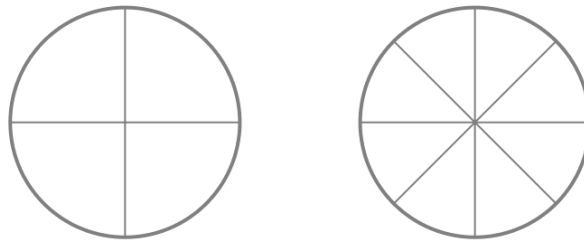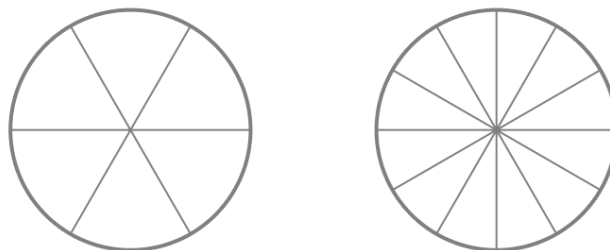
14. Use the simulation to drag 2 green pieces onto *one* of the pies. Does your prediction match the simulation? Record the equivalent fractions below:

$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

15. Use the orange reset button at the bottom right of your screen to reset the model. Now, use the yellow up arrow to change the denominator of the first fraction to 6.

Using a crayon, fill in two sections of the first pie below. Fill in the correct number of sections for the 2nd pie to make it an equivalent fraction to the first.
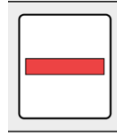
16. Use the simulation to drag two pieces into the **first** pie. Do your predictions match the simulation?
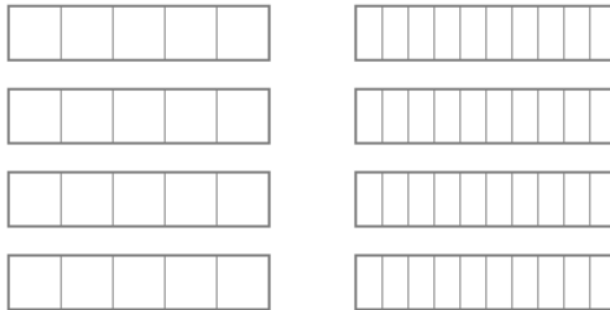Record the equivalent fractions:

$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

17. Use the orange reset button at the bottom right of your screen to reset the model. Now, use the yellow down arrow to change the denominator of the first fraction to 5. Last, click the red bar at the top of your screen to change the shape of your whole figures.

Fill in 2 sections of the first bar model below. Fill in the correct number of sections for the 2nd bar model to make it an equivalent fraction to the first.

Record the equivalent fractions:

_____ = _____

18. Use the simulation to drag two pieces into the first bar model. Do your predictions match the simulation?

19. Clear your screen. Use the shape buttons, up and down arrows and pieces to create your own equivalent fractions for the shapes below. Draw lines and fill in the shapes below with your crayons to copy your models. Record the equivalent fractions in the space provided.

_____ = _____   _____ = _____
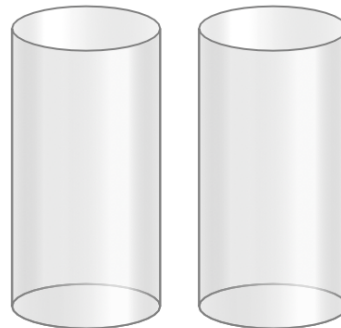
20. Use the orange reset button to clear your screen. Click on the red bar to change your shape. Change the denominator of Fraction 1 to 4. Drag two pieces into **one** of the bar models.   Now, click the **1st** green arrow to the right of Fraction 2. The denominator of Fraction 2 will get smaller. Record the two fractions in the first column below.

Fraction One			
Fraction Two			

21. Now, click the **2nd** green arrow to the right of Fraction Two. Record the two fractions in the 2nd column.

22. Repeat step 21. Record the two fractions in the 3rd column.

23. What do you notice about the numerator and denominator of Fraction Two after steps 21 and 22.

_____

_____

_____.

24. Are all of these fractions equivalent? Why or Why not?

_____

_____

_____.

Challenge:

Now that we have explored equivalent fractions, how two fractions with different numerators and denominators can be equivalent and the relationships between the numerators and denominators of these equivalent fractions let's test our understanding.

25. At the bottom of your screen, click on the *Game* button that is to the right of the house symbol:


26. Select Level 1.
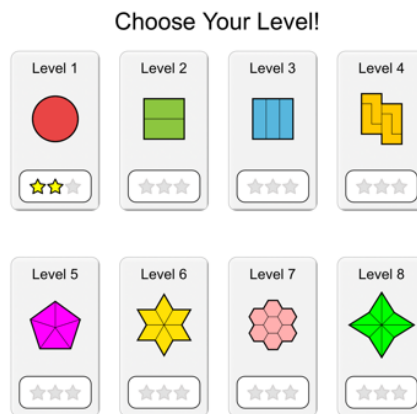
27. Complete this level by dragging equivalent fractions onto the scales in the center of the screen. The fractions will be represented both through numbers and pictures. After you have dragged two fractions onto the scales, press the check button to check your answer.
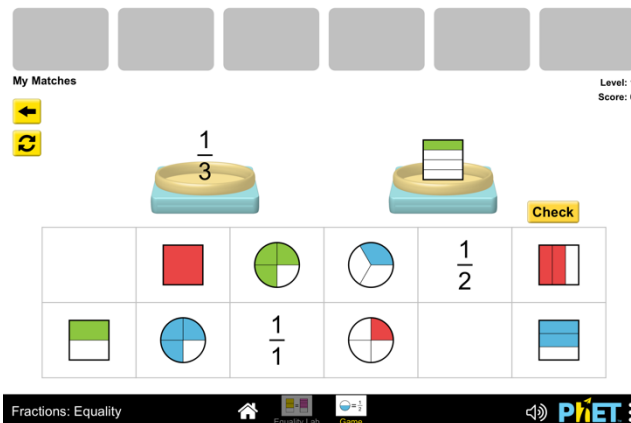

When you've selected two equivalent fractions your answers will move to the grey boxes at the top of your screen. *Pay close attention to the numerators, denominators, parts and wholes when comparing these fractions. This will help you determine which are equivalent.*

Continue matching equivalent fractions until all 6 gray boxes are filled. When you have found all of the equivalent fractions record your score below and press the continue button in the center of your screen.
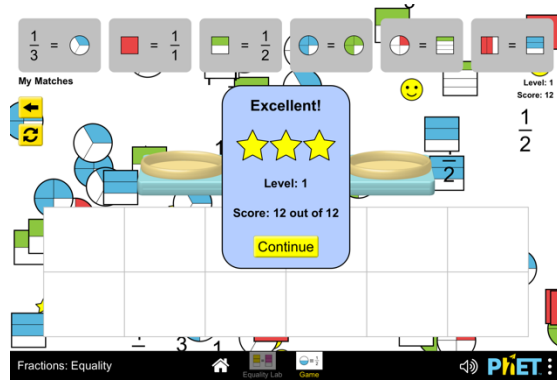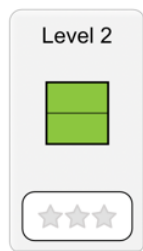

Record your Level 1 score here:
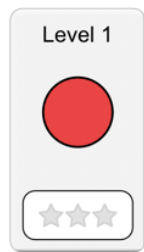
_____ of 12

28. Complete Level 2 the same way your completed Level 1, dragging equivalent fractions to the scales, checking your answers with the check button. When all the gray boxes have been filled record your score below and press the continue button again. Record your Level 2 score below:

_____ of 12

29. If you have time left over, attempt Level 3 the same way you completed Levels 1 and 2.

Exit Ticket:

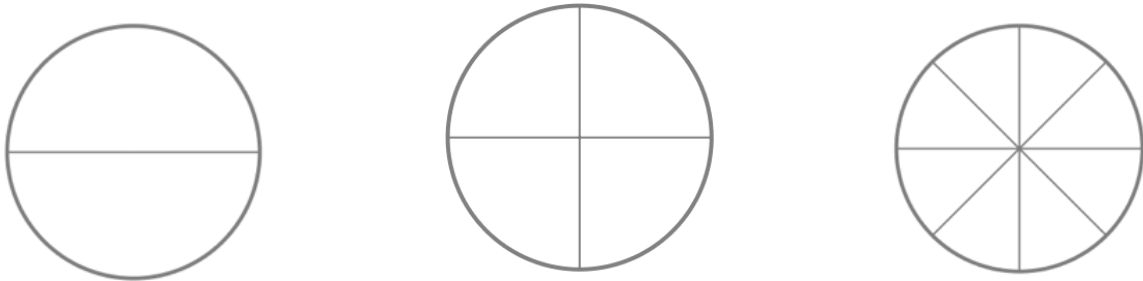1. Explain, in your own words, what equivalent fractions are.

   _____

   _____

   _____

   _____.

2. Fill in any number of sections in the first pie model below. Fill in the second pie to create an equivalent fraction. Fill in the third pie to create another equivalent fraction.

   Record the equivalent fractions below:

   $$\frac{\quad}{\quad} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$$

3. Jill and Jeremy make equal sized pizzas. Jill cuts her pizza into 4 pieces. Jeremy cuts his pizza into 8 pieces. They both eat 2 pieces of their pizza. Jeremy thinks they ate the same amount of pizza. Is Jeremy right? _____.

Why or why not? Use words and pictures to explain:
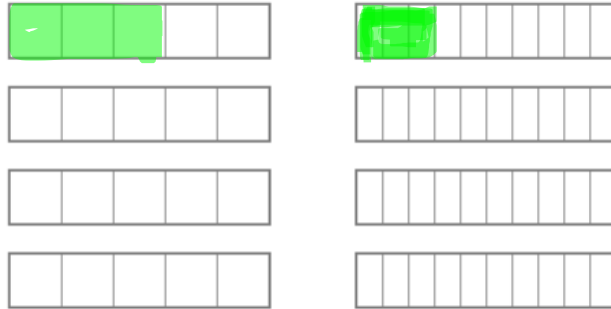
4. Carter drew the fraction model below: He says: These fractions are equivalent because they have the same number of pieces filled in.

Is Carter correct? _____

Use the models below to draw your own equivalent fractions: