ipdae INSTITUTE FOR THE PROFESSIONAL DEVELOPMENT OF ADULT EDUCATORS

Module: Mathematics

Lesson Title: Is It the Same? Equivalent Fractions

Standards for the Lesson

Florida Adult Basic Education Mathematics Standards
Develop understanding of equivalent fractions. (CCR.MAE.ABE.5.2.2)

Interpreting the Standard

1 Standards	2 Skills Included in the Standard	3 Concepts Included in the Standard	4 Through a Particular Context	5 Cognitive Demand/Levels of Thinking	6 Sample Activity
Develop understanding of equivalent fractions. (CCR.MA.ABE.5.2.2)	develop	Understanding of equivalent fractions	Use of manipulatives to explore and discover and the use of real-world problems	DOK 1	Have students use fraction tiles to visually determine equivalent vs. non-equivalent fractions. Have students identify different ways in equivalent fractions are useful in real-world situations.

Objectives of the Lesson

Students will:

- Use fraction tiles to identify and generate equivalent fractions
- Define equivalent vs. non-equivalent fractions

Materials

- Hershey candy bars
- Fraction tiles (created from **Handout A: Fraction Tiles** or purchased)
- **Handout B: Is It Equivalent?**
- PowerPoint presentation (select appropriate slides)
- **Handout C: Fraction Blocks** (optional)
- **Handout D: 1-100** (optional)

Instructional Plan

Overview

This lesson focuses on the use of fraction tiles to assist students in exploring and discovering equivalent vs. non-equivalent fractions. Note that fraction tiles can be used at higher achievement levels to teach students how to add, subtract, multiply, and divide fractions as well.

The use of manipulatives, rather than worksheets, provides students with the opportunity to explore and discover basic concepts in the area of numeracy. This is highly important as students progress onto more rigorous mathematical reasoning situations.

Process

Have students tell you everything they know about equivalent and non-equivalent fractions. Although many of the ideas may not be mathematically sound, some ideas will "make sense." This will also assist you in better understanding where your students may need additional assistance throughout the lesson.

Introduce the lesson by unwrapping two Hershey bars. Ask students how many sections the bar is divided into. Next, break off six pieces of one bar and give it to a student. Ask the students to identify how many pieces of the bar they were given. Remind students that the number of pieces they were given would represent the numerator and the denominator would be the total number of pieces in a whole candy bar.

Have a student write the fraction on the board. Now, break the second candy bar in ½. (Take special care to show the undivided side when breaking the second bar in half.) Ask the students to identify what fraction of the candy bar they have now. Have a student write this fraction on the board. Ask the students who has more candy? Ask the students how the two pieces are related. Repeat this procedure by breaking the candy bar into fourths. Ask students how many of ¼ sections it would take to equal a ½ section. Students should respond that it would take 2 sections.

Share with students that they will be exploring equivalent and non-equivalent fractions in today's lesson.

Provide students with a set of fraction tiles. You can either make the tiles or have students make their own set of fraction tiles. Instead of making tiles, you can also purchase them quite inexpensively online or at a team store. A template for fraction tiles is provided as Handout A: Fraction Tiles.

Show students how to use the fraction tiles to identify equivalent fractions. For example, how many 1/6 tiles does it take to create 1/3? Model for students how to use the 1/6 fraction tiles to totally cover the 1/3 fraction strip. Students should see that it takes two 1/6 fraction tiles to cover the 1/3 fraction strip. Therefore, 2/6 is equivalent to 1/3.

As you model for students, also show them fractions that are not equivalent, such as is 1/9 equivalent to ¼? Take the 1/9 tiles and lay them on top of the ¼ strip. Students should quickly see that a person cannot make an equivalent fraction.

Divide the class into teams. Provide each team with **Handout B: Is It Equivalent?** and fraction tiles. Have students take out the requested tiles and first predict whether or not the fractions are equivalent. Then, have students use the fraction tiles to determine whether or not their prediction was correct.

Have students share their discoveries with the class.

Sample Debriefing Questions

- What is one thing that you learned about equivalent fractions?
- How do you know whether or not fractions are equivalent?
- Do you have another way to figure out whether or not fractions are equivalent? Share your process.
- Can you create a rule for determining whether or not fractions are equivalent?

Modifications for Different Levels

This lesson provides a basic lesson at the early stages of mastery of the Number Operations: Fractions standard. For students at higher levels of mastery [Apply and extend previous understanding of multiplication and division to multiply and divide fractions. (CCR.MA.ABE.5.3.5)], use fraction tiles and fraction blocks to teach how to multiply and divide fractions using manipulatives. This provides students with the concrete knowledge of how and why the process works.

To assist you in teaching these skills, access the PowerPoint attached to this lesson and integrate fraction tiles and fraction blocks, as well as the 1-100 chart for simplifying fractions (**Handouts A, C, D**). Show students how to use the tiles and the blocks to multiply and divide fractions, as well as how to use the 1-100 chart for exploring how to simplify fractions. You may wish to use problems from your classroom materials for students to practice using the fraction blocks or access materials on the Internet by doing a search of multiplying and dividing fractions using fraction blocks.

Handout A: Fraction Tiles

1											
$\frac{1}{2}$											$\frac{1}{2}$
$\frac{1}{3}$										$\frac{1}{3}$	
$\frac{1}{4}$									$\frac{1}{4}$		
$\frac{1}{5}$								$\frac{1}{5}$			
$\frac{1}{6}$							$\frac{1}{6}$				
$\frac{1}{7}$						$\frac{1}{7}$					
$\frac{1}{8}$					$\frac{1}{8}$						
$\frac{1}{9}$				$\frac{1}{9}$							
$\frac{1}{10}$			$\frac{1}{10}$								
$\frac{1}{11}$		$\frac{1}{11}$									
$\frac{1}{12}$	$\frac{1}{12}$										

Handout B: Is It Equivalent?

Using the following tables, predict which tiles would have parts that are equivalent to the stated fraction. Then use your fraction tiles to determine whether or not your predictions were correct.

Equivalent to 1/2 or Not?

Using your 1/2 fraction strip, predict which of the following tiles would have parts that are equivalent to your 1/2 strip. Then measure and see!

Equivalent?	Yes	No	How many parts = 1/2
1/3			1/2 = /3
1/4			1/2 = /4
1/5			1/2 = /5
1/6			1/2 = /6
1/7			1/2 = /7
1/8			1/2 = /8
1/9			1/2 = /9
1/10			1/2 = /10
1/11			1/2 = /11
1/12			1/2 = /12

1. Write a list of all of the fractions that are equivalent to 1/2.

   1/2 = _____

2. Looking at your list, what do you notice about all of the denominators?

3. Looking at your list, how are the numerators and denominators related?

4. Using what you have discovered, list 3 other fractions that would be equal to ½.

Equivalent to 1/4 or Not?

Using your 1/4 fraction strip, predict which of the following tiles would have parts that are equivalent to your 1/2 strip. Then measure and see!

Equivalent?	Yes	No	How many parts = 1/4
1/2			1/4 = /2
1/3			1/4 = /3
1/5			1/2 = /5
1/6			1/2 = /6
1/7			1/2 = /7
1/8			1/2 = /8
1/9			1/2 = /9
1/10			1/2 = /10
1/11			1/2 = /11
1/12			1/2 = /12

1. Write a list of all of the fractions that are equivalent to 1/4.

   1/4 = _____

2. Looking at your list, what do you notice about all of the denominators?

3. Looking at your list, how are the numerators and denominators related?

4. Using what you have discovered, list 3 other fractions that would be equal to 1/4.

Equivalent to 1/3 or Not?

Using your 1/3 fraction strip, predict which of the following tiles would have parts that are equivalent to your 1/3 strip. Then measure and see!

Equivalent?	Yes	No	How many parts = 1/3
1/2			1/3 = /3
1/4			1/3 = /4
1/5			1/3 = /5
1/6			1/3 = /6
1/7			1/3 = /7
1/8			1/3 = /8
1/9			1/3 = /9
1/10			1/3= /10
1/11			1/3= /11
1/12			1/3= /12

1. Write a list of all of the fractions that are equivalent to 1/3.

   1/3 = _____

2. Looking at your list, what do you notice about all of the denominators?

3. Looking at your list, how are the numerators and denominators related?

4. Using what you have discovered, list 3 other fractions that would be equal to 1/3.

Equivalent to 1/3 or Not?

Using your 1/3 fraction strip, predict which of the following tiles would have parts that are equivalent to your 1/3 strip. Then measure and see!

Equivalent?	How many parts = 2/3	How many parts = 2/4	How many parts = 3/4
1/2			
1/3			
1/4			
1/5			
1/6			
1/7			
1/8			
1/9			
1/10			
1/11			
1/12			

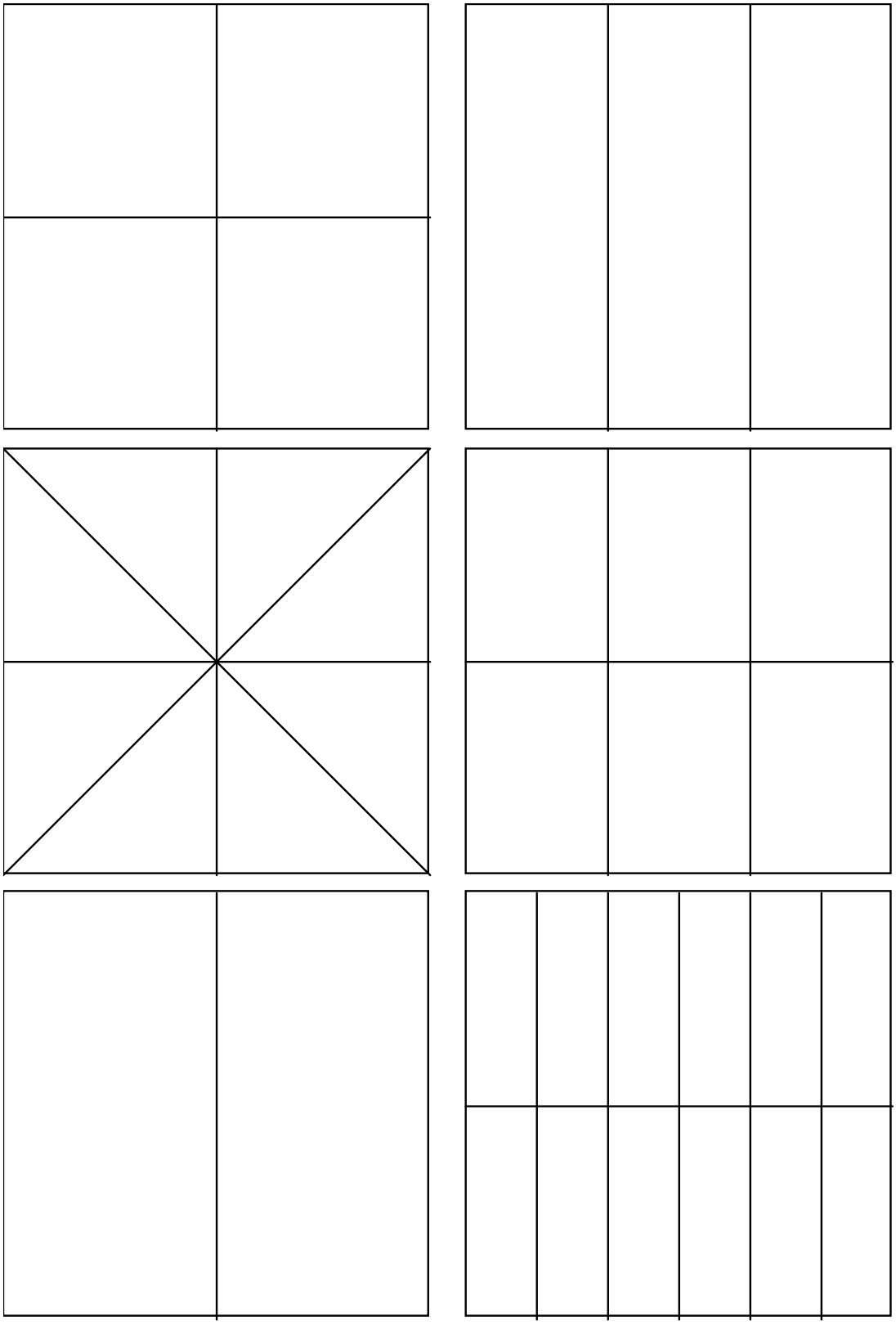
1. What do you notice about all of the denominators that are equivalent to 2/3's?

2. 2/4's?

3. 3/4's?

4. What have you learned about equivalent fractions?

Handout C: Fraction Blocks



Handout D: 1-100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100