**Learning Experience:**

Paper Folding for Fraction Equivalence

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**When planning, include the following:**

**Models (Concrete—Semi-Concrete—Semi-Abstract—Abstract)**

**Problems/Situations**

**Questions**

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| **AKS**:  18.NF.1 explain why a fraction a/b is equivalent to a fraction (n x a/n x b) by using visual fraction models with attention to how the number and size of the parts differ even though the two fractions themselves are the same size; use this principle to recognize and generate equivalent fractions  19.NF.2 compare two fractions with different numerators and different denominators by creating common denominators (such as 1/8 and 3/8) or common numerators (such as 2/4 and 2/5) or by comparing to a benchmark fraction such as 1/2  20.NF.2 use the symbols >, =, or < to compare fractions and justify the conclusions by using a visual fraction model |
| **Vertical Alignment:**  Third Grade   1. explain equivalence of fractions in special cases and compare fractions by reasoning about their size (CCGPS) (3MA\_C2012-20/MCC3.NF.3) 2. recognize two fractions as equivalent (equal) if they are the same size or the same point on a number line (CCGPS) (3MA\_C2012-21/MCC3.NF.3\_a) 3. recognize and generate simple equivalent fractions (e.g., 1/2 = 2/4, 4/6 = 2/3); explain why the fractions are equivalent by using a visual fraction model (CCGPS) (3MA\_C2012-22/MCC3.NF.3\_b)   Fifth Grade   * relate the principle of fraction equivalence, a/b = (n x a)/(n x b), to the effect of multiplying a/b by 1 (CCGPS) (5MA\_C2012-21/MCC5.NF.5) |
| **Standards for Mathematical Practice**:  Reason abstractly and quantitatively.  Construct viable arguments and critique the reasoning of others.  Model with mathematics.  Attend to precision |
| **Materials:**  Activating Strategy PowerPoint  paper cut in squares  crayons, markers, or highlighters  scissors  Student Venn Diagram |
| **Vocabulary:**   * common denominator * compare * denominator * equivalent fractions * like denominators * numerator * unlike denominators |
| **Essential Question**:  How can fractions with different numerators and different denominators be compared? |
| **Activating Strategy:**  Show Activating Strategy PowerPoint. (Draft 19C PowerPoint)   1. Begin a discussion by showing the students two grids of the same size marked in different grid spaces. For example   two grids   1. Ask the students: *Is the same amount of space shaded in both of the grids? (Yes) What fraction of the space is shaded in the first grid? (3/4)  What fraction of the space is shaded in the second grid? (12/16)* 2. Discuss with the students that these two fractions are called equivalent fractions. |
| **Instructional Activity**:   1. Give students a copy of the comparing fractions Venn Diagram. 2. Give the students squares of paper. Ask them to fold the paper in half and color in one half. 3. Then instruct students to fold the paper into fourths. 4. Ask the students: *How many of the fourths are colored in? (2)  What fraction is equivalent to 1/2? (2/4) How do know?* 5. Record 2/4 in the middle section of the Venn Diagram. 6. Then have students explore by folding paper into thirds, sixths, eighths, tenths, etc, and record the equivalent fractions on the Venn diagram. Share and discuss. 7. Have students fold another piece of paper into fourths and color in ¼. 8. Take another piece of paper and fold into eighths and color in 1/8. 9. Ask the students:   *How do these two fractions compare to each other? (1/4 is larger than 1/8)*  *Where would we place them in our Venn Diagram? (less than ½)*  *On our fourths paper, how many parts could we color in to make a fraction greater than 1/2? (3 and 4) Record on Venn Diagram.*  *On our eighths paper, how many parts could we color to make fractions greater than ½? (5, 6, 7, and 8) Record on Venn Diagram.*  *What are other fourth and eighth fractions can you make that are less than ½? (2/8, 3/8) Record on Venn Diagram.*   1. Allow students with a new piece of paper folding into a different fraction and comparing to the ½ benchmark. 2. Expanding the experience  * Working with different papers shapes: circles, rectangles of different sizes, sets * “Making Fractions Practice Task” in the [CCGPS Mathematics: 4th Grade Unit Two Framework](http://gcps4thgradecommoncoretraining.weebly.com/uploads/1/2/4/4/12440763/ccgps_math_4_unit2frameworkse.pdf) p. 37 * Fraction Action by Loreen Leedy * Sheppard Software – [Equivalent Fraction Matching](http://sheppardsoftware.com/mathgames/fractions/memory_equivalent1.htm), [Reduced Fraction Shoot](http://sheppardsoftware.com/mathgames/fractions/reduce_fractions_shoot.htm), [Equivalent Fraction Shoot](http://sheppardsoftware.com/mathgames/fractions/equivalent_fractions_shoot.htm), [Compare Fraction Balloon Pop](http://sheppardsoftware.com/mathgames/fractions/Balloons_fractions1.htm)  1. Extending the experience  * Have the student create ½, ¼, and 1/8 on the same piece of paper. * “Their Fair Share” ” in the [CCGPS Mathematics: 4th Grade Unit Two Framework](http://gcps4thgradecommoncoretraining.weebly.com/uploads/1/2/4/4/12440763/ccgps_math_4_unit2frameworkse.pdf) p. 11 * Finding out how many thirds or fifths are equal to ½. * Comparing Fractions on a Grid in the [North Carolina Instructional Supports: 4th Grade Mathematics – Unpacked Content](http://gcps4thgradecommoncoretraining.weebly.com/uploads/1/2/4/4/12440763/unpacked-4th.pdf) p. 11 |
| **Summarizing**:  3-2-1  3 – Write 3 examples of fraction equal to ½.  2 – Write 1 fraction greater than ½ and 1 fraction less than ½.  1 – Explain how using ½ as a benchmark number helps us compare fractions. |

**Did your plans you include the following?**

**Models (Concrete—Semi-Concrete—Semi-Abstract—Abstract)**

**Problems/Situations**

**Questions**

Equal to ½

Less than ½

Greater than ½

Comparing Fractions Venn Diagram

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_