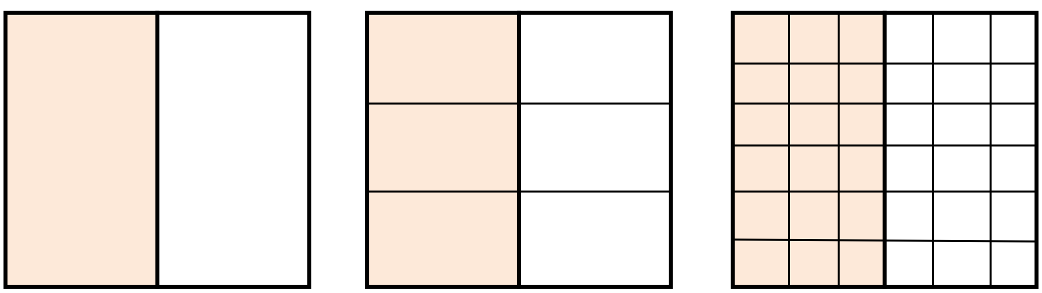
A Union of Professionals
Common Core State Standards

Dear Parents and Caregivers,

Thank you for finding time to support your children as they learn mathematics. One of the more challenging concepts for fourth graders is that of **equivalent fractions.** Using visuals and illustrations is a great way for them to understand and “see” equivalent fractions. Just as 5 + 5 or 8 + 2 name the same amount as 10, there are different fractions that name the same amount. For example, 1/4, 3/12 and 6/24 all name the same amount that is halfway between zero and 1/2. That makes them equivalent. Here is how we are trying to help students visualize this standard about equivalent fractions.

**Number and Operations-Fractions (4.NF)**
**Extend understanding of fraction equivalence and ordering. (4.NF.1)**
Explain why a fraction *a*/*b* is equivalent to a fraction (n × *a)*/(*n* × *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.

## In each picture below 1/2 of the rectangle is shaded.



| | | |
|---|---|---|
| $\frac{1}{2}$ here shows 1 of 2 equal parts of the rectangle. $\frac{1}{2}$ is a unit fraction. | If we split each half into 3 equal parts, half the rectangle is still shaded. But now there are 3 parts shaded of 6. This is the same as multiplying numerator and denominator of $\frac{1}{2}$ by 3.<br>3 x 1 = 3; 3 x 2 = 6<br>The new fraction name is $\frac{3}{6}$. $\frac{3}{6}$ and $\frac{1}{2}$ name equal parts of the rectangle. | We can make the parts smaller. There are now 18 parts in $\frac{1}{2}$ and 36 parts in the whole rectangle. This is like multiplying $\frac{3}{6}$ by 6.<br>$\frac{1}{2}$ and $\frac{3}{6}$ and $\frac{18}{36}$ all name the same amount and are equivalent. **Equivalent fractions can be created by multiplying the numerator and denominator by the same number.** |

$\frac{1}{2}$, $\frac{3}{6}$, and $\frac{18}{36}$ are equivalent fractions. They all equal $\frac{1}{2}$. They all have the **<u>same size even though the number and size of parts differ</u>**.

Another way to "see" equivalent fractions is by using a multiplication chart. You can use it to generate equivalent fractions. See below:

**Multiplication Chart**

| x | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 3 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| 4 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| 8 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| 9 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

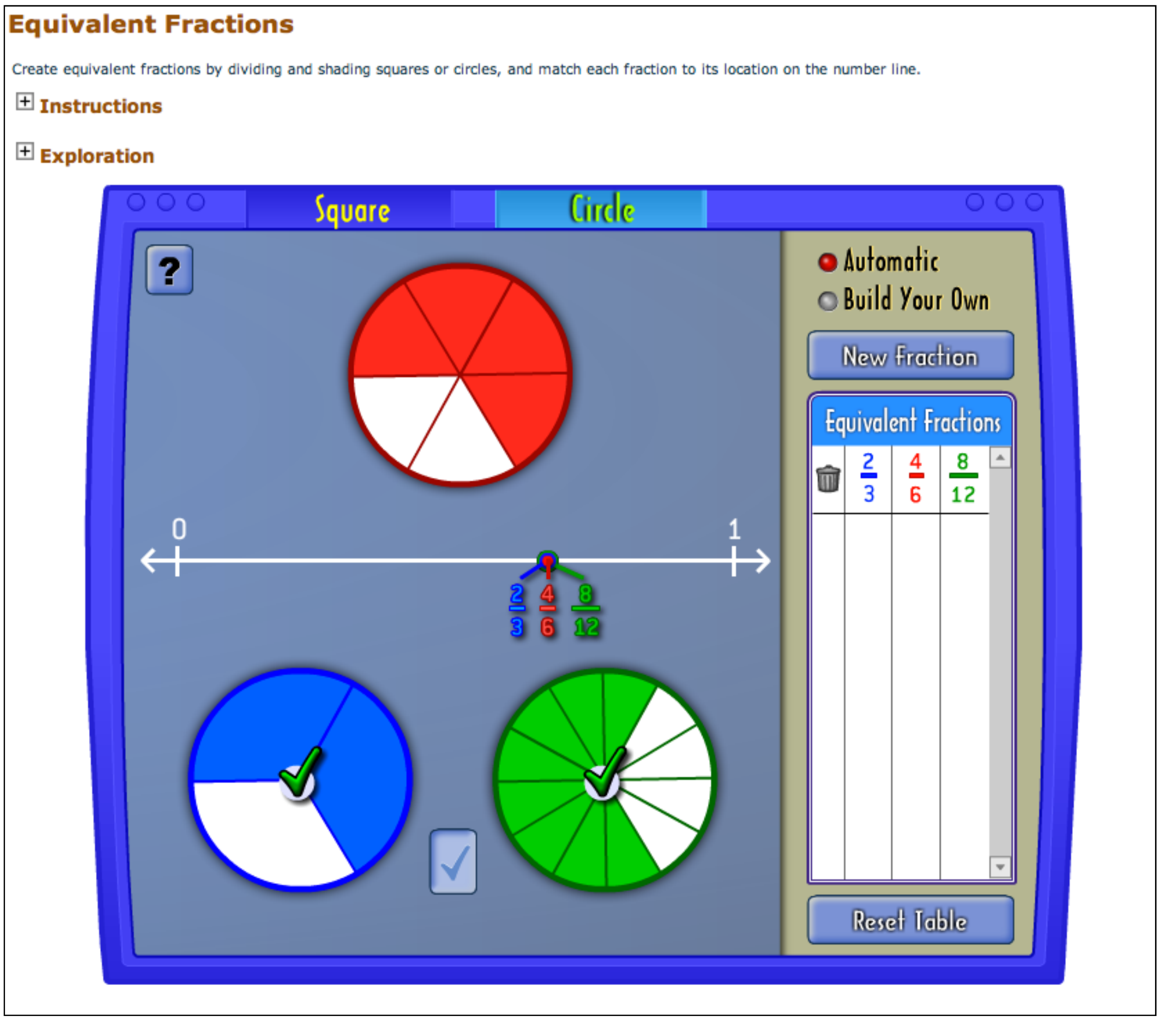
Think of the "blue row" (top shaded) as numerators and the "red row" (bottom shaded) as denominators. What do you see? Can you see the fractions? Notice that these fractions are equivalent. $\frac{1}{2}$ is equivalent to $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$, $\frac{6}{12}$, $\frac{7}{14}$, $\frac{8}{16}$, $\frac{9}{18}$, and $\frac{10}{20}$. Can the student add five more equivalent fractions to this set? The reason that this happens is that BOTH the "numerator" and "denominator" are multiplied by the same number (the number on first row). As a result, equivalent fractions are generated. Is this always true with any two rows in the table? Look at rows 2 and 5.

| x | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 3 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| 4 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| 8 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| 9 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

Do we generate equivalent fractions even if the green row of numbers (numerators) and the blue row of numbers (denominators) are not next to each other? Are $\frac{2}{5}$, $\frac{4}{10}$, $\frac{6}{15}$, $\frac{8}{20}$, $\frac{10}{25}$, $\frac{12}{30}$, $\frac{14}{35}$, $\frac{16}{40}$, $\frac{18}{45}$, and $\frac{20}{50}$ equivalent fractions? Explain why. Can you add five more fractions equivalent to $\frac{2}{5}$ ?

**Family practice.** Here is an online game you can play with your child. Try this Equivalent Fraction Game. It's a lot of fun!!! Click this link for the National Council of Teachers of Mathematics site to play.

http://illuminations.nctm.org/activitydetail.aspx?id=80




Fourth grade teacher