

Equivalent Fractions - Relationship Between Numerator + Denominator.

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Differentiate and Assess

Not every student will be ready to investigate this concept at this Level and so we will need to differentiate to ensure every student is learning at their leading edge. Select the Differentiate button on this screen.

Integrate

Every mathematical concept is integrally related to other mathematical concepts. Teaching and learning related concepts simultaneously develops deep relational understanding. Select the Integrate button on this screen.

Intervene

Some students may not yet be ready to investigate this concept at any Level, and so we will need to provide some intervention. Select the Intervention button on this screen.

EQUIVALENT FRACTIONS - RELATIONSHIP BETWEEN NUMERATOR + DENOMINATOR.

EXPLICIT TEACHING PLAN OVERVIEW PAGE

THIS PAGE IS A SUMMARY OF THE EXPLICIT TEACHING PLAN, INCLUDING STRATEGIC QUESTIONS, AND DESCRIBING THE SEQUENCE WHICH WILL OCCUR OVER MULTIPLE LESSONS.

RESOURCES: FRACTION WALL (THESE CAN BE PURCHASED OR THE ONE ATTACHED HERE MAY BE USED), PENCIL, PAPER

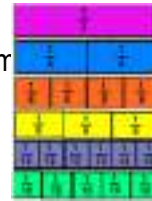
WHAT COULD WE DO?

Children:

- use a fraction wall to find fractions equivalent to a unit fraction, for example,
- identify the relationship between the numerator and the denominator in equivalent fractions, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$

In fractions equivalent to a half, the numerator is half of the denominator.

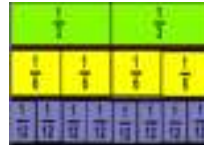


- use the relationship between the numerator and the denominator in equivalent fractions to create equivalent fractions, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10} = \frac{10}{20} \quad \frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10} = \frac{10}{20}$$

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10} = \frac{10}{20} = \frac{25}{50}$$

- use a fraction wall to find fractions equivalent to a non-unit fraction, for example,



- identify the relationship between the numerator and the denominator in equivalent fractions, for example,

In fractions equivalent to 2 thirds, the numerator is 2 thirds of the denominator. $\frac{2}{3} = \frac{4}{6} = \frac{8}{12}$

- use the relationship between the numerator and the denominator in equivalent fractions to create equivalent fractions, for example,

$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{10}{15} \quad \frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{12}{18}$$

$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{12}{18} = \frac{10}{15} \quad \frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{12}{18} = \frac{10}{15}$$

WHAT LANGUAGE COULD WE USE TO EXPLAIN AND ASK QUESTIONS?

Children

- ask one another questions about equivalent fractions using a fraction wall, and through the relationship between the numerator and denominator, for example:
 - ▶ How could we find fractions equivalent to a half using the fraction wall?
 - ▶ What is the relationship between the numerator and denominator in fractions equivalent to a half?
 - ▶ How could we find fractions equivalent to two-thirds using the fraction wall?
 - ▶ What is the relationship between the numerator and denominator in fractions equivalent to two-thirds?

EQUIVALENT FRACTIONS - RELATIONSHIP BETWEEN NUMERATOR + DENOMINATOR.

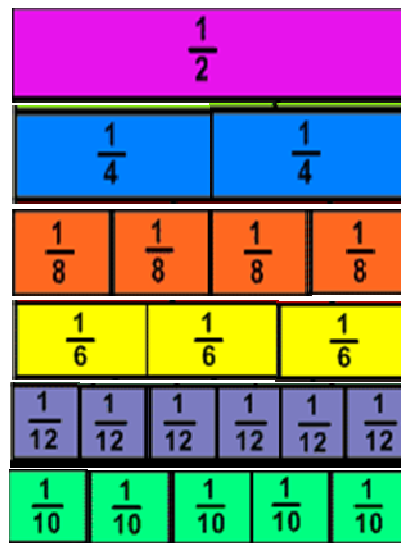
EXPLICIT TEACHING PLAN

FULL EXPLICIT TEACHING PLAN, EMBEDDING DEEP RELATIONAL UNDERSTANDING, METALANGUAGE, AND QUESTIONS THAT MAY BE USED OVER MULTIPLE LESSONS.

WHAT COULD WE DO?	WHAT LANGUAGE COULD WE USE TO EXPLAIN AND ASK QUESTIONS?
<p>Children think about, talk and listen to a friend about, then have the opportunity to share what they already know.</p> <p>Record, for example, 'A fraction is a part'. Record, for example, equivalent</p> <p>Underline the 2 parts of the word, for example, <u>equivalent</u> Record 'equal' under 'equi', for example, <u>equivalent</u> equal</p>	<ul style="list-style-type: none">▶ Today brings an investigation about equivalent fractions.▶ What do you know about equivalent fractions?▶ Talk about equivalent fractions with a friend.▶ Is anyone ready to share what they are thinking about equivalent fractions? ▶ We've investigated fractions.▶ And we found that when we have a fraction of something, we don't have the whole thing. We just have part of it.▶ So we found that a fraction is a part.▶ In Mathematics, we love to measure things!▶ So when we measure the part, we call it a fraction!▶ Today we're going to investigate equivalent fractions.▶ What do you think equivalent means?▶ Let's look at the parts of the word – 'equi' and 'valent'▶ What do you think 'equi' might mean?▶ Does 'equi' look a little like 'equal'?▶ Let's look at the second part of the word – 'valent'.▶ 'valent' means value, from an old English word 'valere'.

Record 'value' under 'valent', for example, equivalent

equal value



Select a half from the fraction wall, for example,

Place 2 quarters under the half, for example,

Place 4 eighths under the half, for example,

Children continue placing fractions equivalent to a half under their half, for example,

Don't record the fractions in order of numerator and denominator (not $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{6}{12}$) because then the pattern children may be distracted by the pattern of the numerators 1, 2, 3, 4, 5, 6, and the patterns of the denominators 2, 4, 6, 8, 10, 12. The pattern that we want children to investigate is the relationship between the numerator and denominator in fractions equivalent to a half.



Record, for example, $\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$

- ▶ So equivalent means equal value.
- ▶ So what do you think equivalent fractions are?
- ▶ Do you think equivalent fractions have equal value? Let's investigate!



- ▶ How could we use a fraction wall to identify fractions that are equivalent to a half?
- ▶ Let's select a half from our fraction wall.
- ▶ How can we create fractions equivalent to a half using quarters?
- ▶ Will we need 2 quarters?
- ▶ How can we create a fraction that is equivalent to a half using eighths?
- ▶ Will we need 4 eighths?
- ▶ Let's continue creating fractions that are equivalent to a half.
- ▶ How could we record this?
- ▶ Are all of these fractions equivalent to a half?
- ▶ Does equivalent mean 'equal value'?
- ▶ Does an equals sign mean 'equal value'?

- ▶ Could we record a half, and the fractions that are equivalent using equals signs?
- ▶ Did we use more than one equals sign in our number sentence?
- ▶ What does the equals sign tell us?
- ▶ Does the equals sign tells us that one side of the equals sign is equal to the other side?



Point to $\frac{1}{2}$ and $\frac{2}{4}$ in the number sentence, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$




Point to $\frac{2}{4}$ and $\frac{4}{8}$ in the number sentence, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$




Point to $\frac{4}{8}$ and $\frac{3}{6}$ in the number sentence, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$


Point to $\frac{1}{2}$ and $\frac{3}{6}$ in the number sentence, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$


Point to $\frac{1}{2}$ and $\frac{5}{10}$ in the number sentence, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$


- ▶ Is a half equal to 2 quarters?
- ▶ Is 2 quarters equal to 4 eighths?
- ▶ Is 4 eighths equal to 3 sixths?
- ▶ Is a half equal to 3 sixths?
- ▶ Is a half equal to 5 tenths?
- ▶ Are all of these fractions equal to a half?
- ▶ If all of these fractions are equal to a half, are they all equal to each other?
- ▶ Do the equals signs tell us that all of these fractions are all equal to one another?
- ▶ So because all of these fractions are equivalent to a half, they are all equivalent to one another.

Point to the numerator and denominator in a half, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$

Point to the numerator and denominator in 2 quarters, for example,

$$\frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$

Point to the numerator and denominator in 4 eighths, for example,

$$\frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$

Point to the numerator and denominator in 3 sixths, for example,

$$\frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$

- ▶ So we can see that these fractions are all equivalent using fractions on a fraction wall.
- ▶ But could we identify fractions equivalent to a half without a fraction wall?

- ▶ Let's investigate the numerator and the denominator in each fraction.
- ▶ What is the relationship between the numerator and the denominator in a half?
- ▶ Is 1 half of 2?
- ▶ Is the numerator half of the denominator?

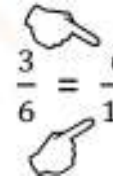
- ▶ What is the relationship between the numerator and the denominator in 2 quarters?
- ▶ Is 2 half of 4?
- ▶ Is the numerator half of the denominator?

- ▶ What is the relationship between the numerator and the denominator in 4 eighths?
- ▶ Is 4 half of 8?
- ▶ Is the numerator half of the denominator?

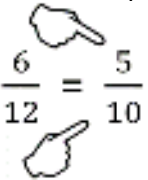
- ▶ What is the relationship between the numerator and the denominator in 3 sixths?
- ▶ Is 3 half of 6?
- ▶ Is the numerator half of the denominator?

- ▶ What is the relationship between the numerator and the denominator in 6

Point to the numerator and denominator in 6 twelfths, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$


Point to the numerator and denominator in 5 tenths, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10}$$


Record, for example, in fractions equivalent to a half, the numerator is half of the denominator.

Record the numerator 10, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10} = \frac{10}{20}$$

Record the denominator 20, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10} = \frac{10}{20}$$

twelfths?

- ▶ Is 6 half of 12?
- ▶ Is the numerator half of the denominator?

- ▶ What is the relationship between the numerator and the denominator in 5 tenths?
- ▶ Is 5 half of 10?
- ▶ Is the numerator half of the denominator?

- ▶ What is the relationship between the numerator and denominator in fractions that are equivalent to a half?
- ▶ Is the numerator half of the denominator in fractions that are equivalent to a half?

- ▶ Let's see if we can find some fractions that are equivalent to a half without the fraction wall.
- ▶ What if our fraction has 10 as the numerator?
- ▶ What would the denominator be?
- ▶ If the numerator is half of the denominator in fractions that are equivalent to a half, will the denominator be twice the numerator?
- ▶ Will the denominator be 2 times 10?
- ▶ Will the denominator be 20?
- ▶ Is 10 twentieths equivalent to a half?
- ▶ Is 10 half of 20?
- ▶ Is the numerator half of the denominator?
- ▶ Let's select a denominator.

Record the dominator 50, for example,

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10} = \frac{10}{20} = \frac{\quad}{50}$$

Record the numerator 25, for example,

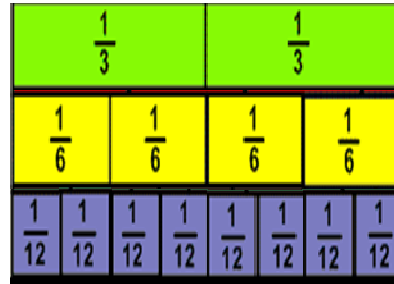
$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12} = \frac{5}{10} = \frac{10}{20} = \frac{25}{50}$$

- ▶ Because we are finding fractions equivalent to a half, and to find a half we divide by 2, will our denominators be multiples of 2?
- ▶ Is 50 a multiple of 2?
- ▶ What if our fraction has 50 as the denominator?
- ▶ What would the numerator be?
- ▶ Will the numerator be half of the denominator?
- ▶ Will the numerator be half of 50?
- ▶ Will the numerator be 25?
- ▶ Is 25 fiftieths equivalent to a half?
- ▶ Is 25 half of 50?
- ▶ Is the numerator half of the denominator?

Select 2 thirds from the fraction wall, for example,

Place 4 sixths under the 2 thirds, for example,

Place 6 twelfths under the 2 thirds, for example,



Record, for example, $\frac{2}{3} = \frac{4}{6} = \frac{8}{12}$

Point to the numerator and denominator in 2 thirds, for example,

$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12}$$

Record, for example, 1 is 1 third of 3 and 1 is $\frac{1}{3}$ of 3

▶ **How could we use a fraction wall to identify non-unit fractions that are equivalent?**

- ▶ Let's select a non-unit fraction from our fraction wall.
- ▶ Let's select 2 thirds.
- ▶ How can we create a fraction that is equivalent to 2 thirds?
- ▶ Is 4 sixths equivalent to 2 thirds?
- ▶ How else can we create a fraction that is equivalent to 2 thirds?
- ▶ Is 8 twelfths equivalent to 2 thirds?

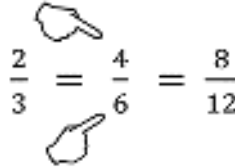
- ▶ How could we record this?

- ▶ Are all of these fractions equal to 2 thirds?
- ▶ If all of these fractions are equal to 2 thirds, are they all equal to each other?
- ▶ Does the equals signs tell us that all of these fractions are all equal to one another?

- ▶ So we can see that these fractions are all equivalent using fractions on a fraction wall.
- ▶ But could we identify fractions equivalent to two-thirds without a fraction wall?
- ▶ Let's investigate the numerator and the denominator in each fraction.
- ▶ What is the relationship between the numerator and the denominator in 2 thirds?
- ▶ Is 2, 2 thirds of 3? Let's investigate!
- ▶ Is 1, 1 third of 3?
- ▶ So if 1 is 1 third of 3, is 2, 2 thirds of 3?

Record, for example, 2 is 2 thirds of 3 and 2 is $\frac{2}{3}$ of 3

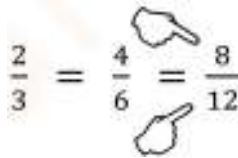
Point to the numerator and denominator in 4 sixths, for example,


$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12}$$

Record, for example, 2 is 1 third of 6 and 2 is $\frac{1}{3}$ of 6

Record, for example, 4 is 2 thirds of 6 and 4 is $\frac{2}{3}$ of 6

Point to the numerator and denominator in 8 twelfths, for example,


$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12}$$

Record, for example, 4 is 1 third of 12 and 4 is $\frac{1}{3}$ of 12

Record, for example, 8 is 2 thirds of 12 and 8 is $\frac{2}{3}$ of 12

Record, for example, in fractions equivalent to 2 thirds, the numerator is 2 thirds of the denominator.

- ▶ So in 2 thirds, 2 is 2 thirds of 3.
- ▶ Is the numerator 2 thirds of the denominator?

- ▶ What is the relationship between the numerator and the denominator in 4 sixths?
- ▶ Is 4, 2 thirds of 6? Let's investigate!
- ▶ Is 2, 1 third of 6?

- ▶ So if 2 is 1 third of 6, is 4, 2 thirds of 6?
- ▶ So in 4 sixths, 4 is 2 thirds of 6.
- ▶ Is the numerator 2 thirds of the denominator?

- ▶ What is the relationship between the numerator and the denominator in 8 twelfths?
- ▶ Is 8, 2 thirds of 12? Let's investigate!
- ▶ Is 4, 1 third of 12?
- ▶ So if 4 is 1 third of 12, is 8, 2 thirds of 12?
- ▶ So in 8 twelfths, 8 is 2 thirds of 12.
- ▶ Is the numerator 2 thirds of the denominator?

- ▶ What is the relationship between the numerator and denominator in fractions that are equivalent to 2 thirds?
- ▶ Is the numerator 2 thirds of the denominator in fractions that are equivalent to 2 thirds?

Record the denominator 18, for example,

$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{\quad}{18}$$

Record the numerator 12, for example,

$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{12}{18}$$

Record the numerator 10, for example,

$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{12}{18} = \frac{10}{\quad}$$

- ▶ Let's see if we find some fractions that are equivalent to 2 thirds without the fraction wall.
- ▶ Because we are finding fractions equivalent to 2 thirds, and thirds means we divided by 3, will our denominators be multiples of 3?
- ▶ Is 18 a multiple of 3?
- ▶ What if our fraction has 18 as the denominator?
- ▶ What would the numerator be?
- ▶ Will the numerator be 2 thirds of the denominator?
- ▶ Will the numerator be 2 thirds of 18?
- ▶ What is 1 third of 18?
- ▶ Is 1 third of 18, 6?
- ▶ If 6 is 1 third of 18, what is 2 thirds of 18?
- ▶ Is 2 thirds of 18, 12?
- ▶ Will the numerator be 12?
- ▶ Is 12 eighteenths equivalent to 2 thirds?
- ▶ Is 12, 2 thirds of 18?
- ▶ Is the numerator 2 thirds of the denominator?

- ▶ What if our fraction has 10 as the numerator?
- ▶ What would the denominator be?
- ▶ If the numerator is 2 thirds of the denominator in fractions that are equivalent to 2 thirds, will 10 be 2 thirds of the denominator?
- ▶ If 10 is 2 thirds of the denominator, how will we find 1 third of the denominator?
- ▶ To find 1 third of the denominator, will we halve 10?
- ▶ What is half of 10?

Record the denominator 15, for example,

$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{10}{15}$$

- ▶ Is half of 10, 5?
- ▶ So if 10 is 2 thirds of the denominator, will 5 be 1 third of the denominator?
- ▶ So if 5 is 1 third of the denominator, what will the denominator be?
- ▶ Will the denominator be 3 times 5?
- ▶ Will the denominator be 15?
- ▶ Is 10 fifteenths equivalent to 2 thirds?
- ▶ Is 10, 2 thirds of 15?
- ▶ Is the numerator 2 thirds of the denominator?

