

# Equivalent Fractions On A Number Line.

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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 ON A NUMBER LINE.

## EXPLICIT TEACHING PLAN OVERVIEW PAGE

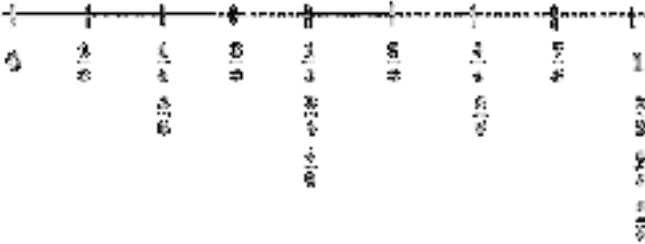
THIS PAGE IS A SUMMARY OF THE EXPLICIT TEACHING PLAN, INCLUDING STRATEGIC QUESTIONS, AND DESCRIBING THE SEQUENCE WHICH WILL OCCUR OVER MULTIPLE LESSONS.

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

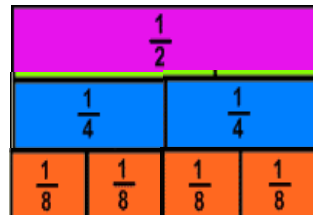
### WHAT COULD WE DO?

Children:

- place fractions on a number line, identifying fractions that are in the same place, for example,



- explain the fractions in the same place are equivalent using a fraction wall, for example,



- explain the fractions in the same place are equivalent using the relationship between the numerator and denominator, for example,
- explain equivalent fractions are in the same place on a number line.

### WHAT LANGUAGE COULD WE USE TO EXPLAIN AND ASK QUESTIONS?

Children

- ask one another questions about equivalent fractions on a number line, for example:
  - how could we place fractions on a number line?
  - are any fractions in the same place?
- are the fractions that are in the same place on the number line equivalent fractions, because they are the same size on a fraction wall?
- are the fractions that are in the same place on the number line equivalent fractions, because they have the same relationship between the numerator and the denominator?
- are the fractions that are in the same place on the number line, equivalent fractions?



# EQUIVALENT FRACTIONS ON A NUMBER LINE.

## 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?

Children think about, talk and listen to a friend about, then have the opportunity to share what they already know.

Record, for example, 'A fraction is a part'.

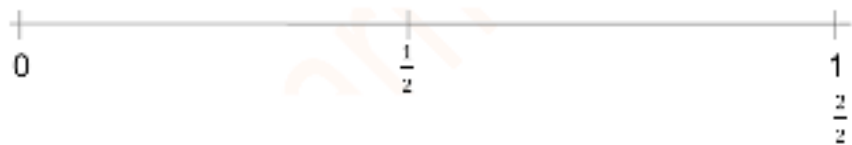
### WHAT LANGUAGE COULD WE USE TO EXPLAIN AND ASK QUESTIONS?

- ▶ 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!
- ▶ We've investigated equivalent fractions.
- ▶ And we found that equivalent fractions have the same relationship between the numerator and denominator.
- ▶ Today we are going to investigate equivalent fractions on a number line.

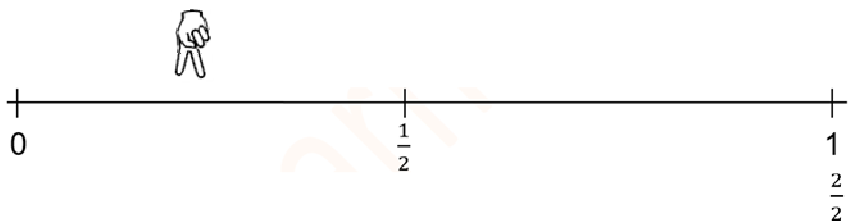
Record a number line from zero to one, for example,



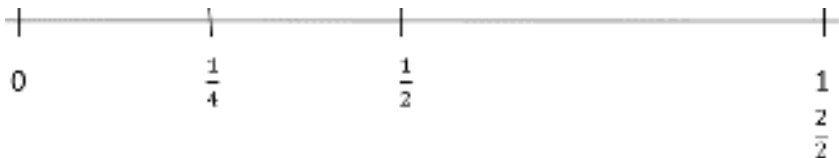
Place halves on the number line by walking your fingers halfway, then the other half of the way to 1, for example,



Walk your fingers along the number line, starting at zero, as children tell you to stop when they think you are a quarter of the way to 1, for example,

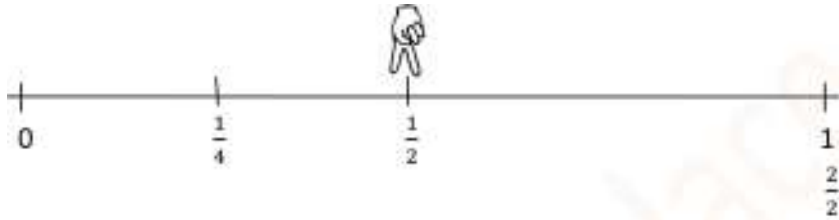


Record a quarter, a quarter of the way between zero and one, for example,

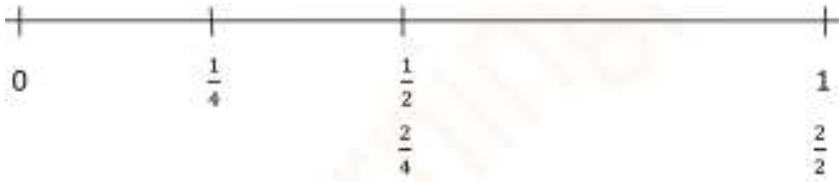


- ▶ We've investigated placing fractions on a number line.
- ▶ And we found that fractions are between whole numbers.
  
- ▶ Let's place halves on our number line.
  
- ▶ Where would a quarter be on this number line?
- ▶ Could we imagine we are a little ant and we're going for a walk along the number line, starting at zero, and we want to stop a quarter of the way to 1?
  
- ▶ Is a quarter, quarter of the way between zero and one?
- ▶ Let's record the fraction 'a quarter' on the number line.

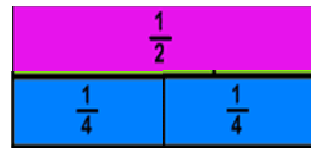
Walk your fingers along the number line as children tell you to stop when they think you are 2 quarters of way to 1, for example,



Record 2 quarters, 2 quarters of the way between zero and one, for example,



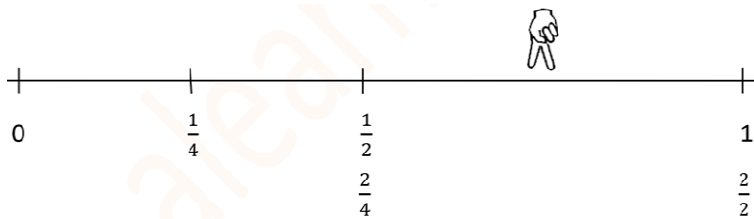
Select a half and 2 quarters from the fraction wall, for example,



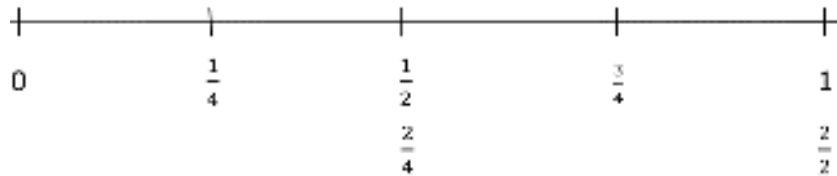
- ▶ Where would 2 quarters be on this number line?
- ▶ Could we imagine we are a little ant and we're going to walk another quarter of the way to 1?
  
- ▶ Have we walked 2 quarters?
- ▶ Is 2 quarters, 2 quarters of the way between zero and one?
  
- ▶ Let's record the fraction '2 quarters' on the number line.
  
- ▶ Are 2 quarters and a half in the same place on the number line?
- ▶ Why?
- ▶ Are a half and 2 quarters equivalent?
- ▶ Could we check if a half and 2 quarters are equivalent using our fraction wall?
- ▶ Are a half and 2 quarters the same size?
- ▶ Could we check if a half and 2 quarters are equivalent using the relationship between the numerators and denominators?
- ▶ What is the relationship between the numerator and denominator in a half?
- ▶ Is 1 half of 2?
- ▶ Is the numerator half of the denominator?
- ▶ What is the relationship between the numerator and denominator in 2 quarters?
- ▶ Is 2 half of 4?

Record the equivalent fractions, for example,  $\frac{1}{2} = \frac{2}{4}$

Walk your fingers along the number line another quarter of the way to 1, for example,



Record 3 quarters, 3 quarters of the way between zero and one, for example,



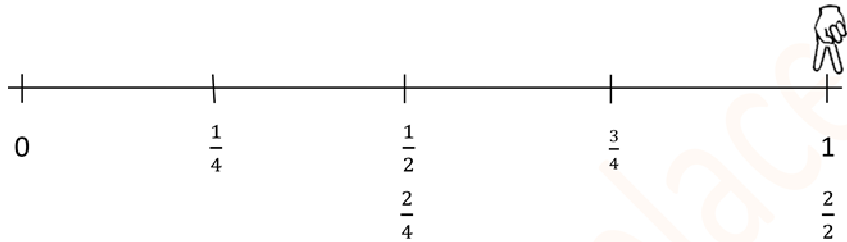
- ▶ Is the numerator half of the denominator?
- ▶ If a half and 2 quarters are the same size on a fraction wall, and the relationship between the numerator and denominator is the same in both fractions, are a half and 2 quarters equivalent fractions?
- ▶ Are equivalent fractions in the same place on a number line?

- ▶ Let's continue placing quarters on the number line.
- ▶ Where would 3 quarters be on this number line?
- ▶ Could we imagine we are a little ant and we're going to walk another quarter of the way to 1?

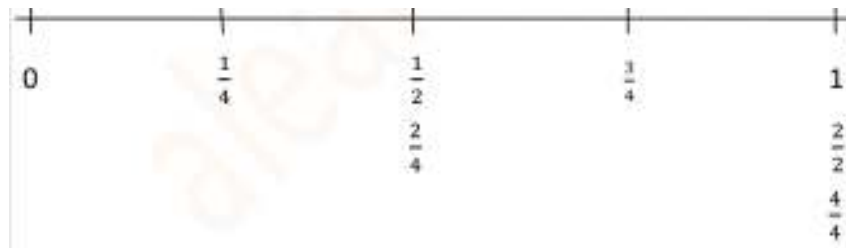
- ▶ Have we walked 3 quarters?
- ▶ Is 3 quarters, 3 quarters of the way between zero and one?
- ▶ Let's record the fraction '3 quarters' on the number line.

- ▶ Could we imagine we are a little ant and we're going to walk another quarter of

Walk your fingers along the number line another quarter of the way to 1, for example,



Record 4 quarters, 4 quarters of the way between zero and one, for example,



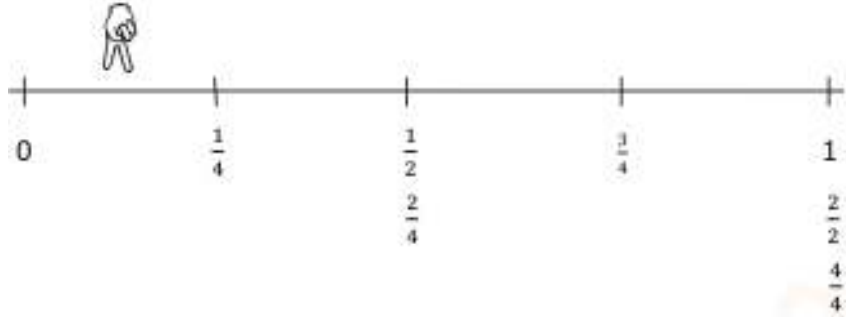
Walk your fingers along the number line, starting at zero, as children tell you to stop

the way to 1?

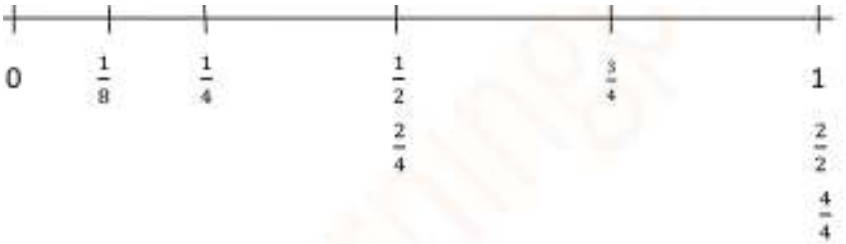
- ▶ Are 4 quarters, 2 halves and 1 all in the same place on the number line?
- ▶ Is 4 quarters equivalent to 1 and to 2 halves?
- ▶ Is the numerator and denominator the same in 4 quarters?
- ▶ When the numerator and denominator are the same, is the fraction equivalent to 1?
- ▶ Do 4 quarters and 2 halves have the same relationship between the numerator and the denominator?
- ▶ In 4 quarters, is the denominator telling us we have divided by 4, and the numerator telling us we have all 4 of the parts?
- ▶ In 2 halves, is the denominator telling us we have divided by 2, and the numerator telling us we have both of the parts?
- ▶ Let's record the fraction '4 quarters' on the number line.
  
- ▶ Where would an eighth be on this number line?
  
- ▶ Could we imagine we are a little ant and we're going for a walk along the number line, starting at zero, and we want to stop an eighth of the way to 1?



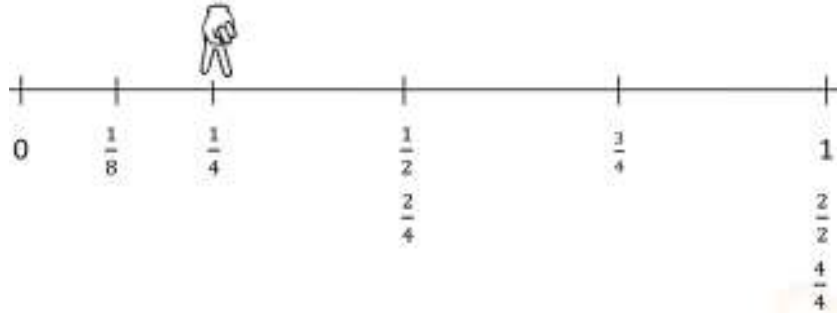
when they think you are an eighth of way to 1, for example,



Record an eighth, an eighth of the way between zero and one, for example,



Walk your fingers along the number line, starting at zero, as children tell you to stop when they think they are 2 eighths of way to 1, for example,

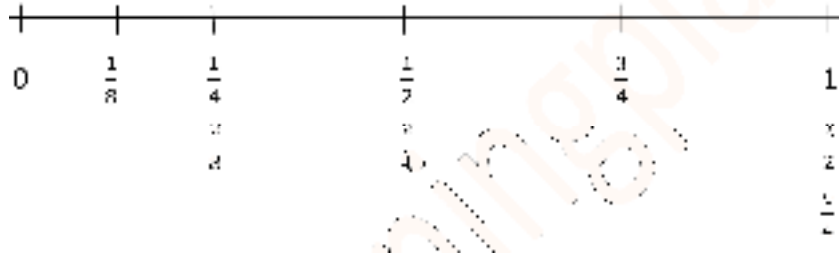


- ▶ Is an eighth, an eighth of the way between zero and one?
- ▶ Let's record the fraction 'an eighth' on the number line.

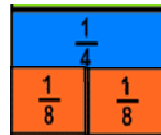
- ▶ Where would 2 eighths be on this number line?
- ▶ Could we imagine we are a little ant and we're going to walk another eighth of the way to 1?

- ▶ Have we walked 2 eighths?

Record 2 eighths, 2 eighths of the way between zero and one, for example,



Select a quarter and 2 eighths from the fraction wall, for example,



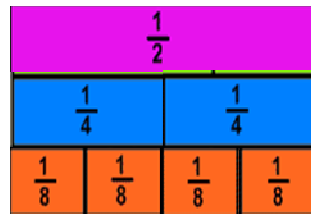
Record the equivalent fractions, for example,  $\frac{1}{4} = \frac{2}{8}$

- ▶ Is 2 eighths, 2 eighths of the way between zero and one?
- ▶ Let's record the fraction '2 eighths' on the number line.
  
- ▶ Are 2 eighths and a quarter in the same place on the number line?
- ▶ Why?
- ▶ Are a quarter and 2 eighths equivalent?
- ▶ Could we check if a quarter and 2 eighths are equivalent using our fraction wall?
  
- ▶ Could we check if a quarter and 2 eighths are equivalent using the relationship between the numerators and denominators?
- ▶ What is the relationship between the numerator and denominator in a quarter?
- ▶ Is 1 a quarter of 4?
- ▶ Is the numerator a quarter of the denominator?
- ▶ What is the relationship between the numerator and denominator in 2 eighths?
- ▶ Is 2 a quarter of 8?
- ▶ Is the numerator a quarter of the denominator?
- ▶ If a quarter and 2 eighths are the same size on a fraction wall, and the relationship between the numerator and denominator is the same in both fractions, are a quarter and 2 eighths equivalent fractions?
- ▶ Are equivalent fractions in the same place on a number line?
  
- ▶ Let's continue placing eighths on the number line.

Place 3 eighths and 4 eighths on the number line, for example,



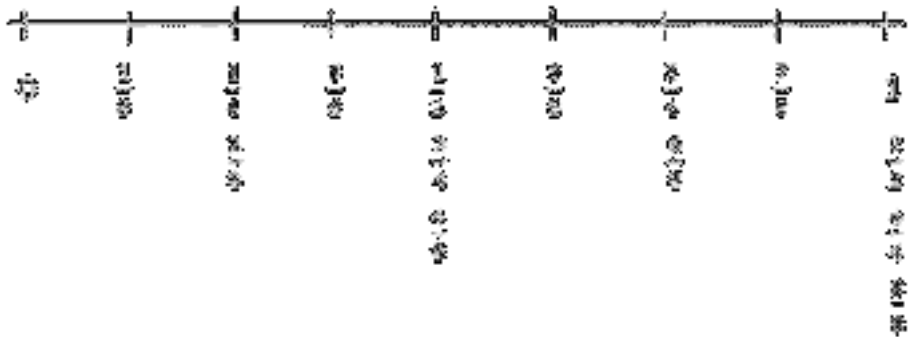
Select 4 eighths, 2 quarters and 1 half from the fraction wall, for example,



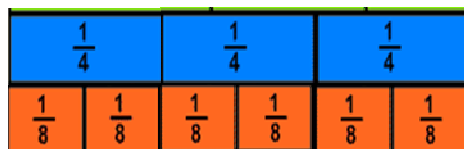
Record the equivalent fractions, for example,  $\frac{4}{8} = \frac{2}{4} = \frac{1}{2}$

Record 5, 6, 7 and 8 eighths on the number line, for example,

- ▶ Where would 3 eighths be on this number line?
- ▶ Where would 4 eighths be on this number line?
- ▶ Are 4 eighths and 2 quarters and 1 half all in the same place on the number line?
- ▶ Why?
- ▶ Are 4 eighths and 2 quarters and 1 half equivalent?
- ▶ Could we check if 4 eighths and 2 quarters and 1 half are equivalent using our fraction wall?
- ▶ Could we check if 4 eighths and 2 quarters and 1 half are equivalent using the relationship between the numerators and denominators?
- ▶ What is the relationship between the numerator and denominator in 4 eighths?
- ▶ Is 4 half of 8?
- ▶ Is the numerator half of the denominator?
- ▶ What is the relationship between the numerator and denominator in 2 quarters?
- ▶ Is 2 half of 4?
- ▶ Is the numerator half of the denominator?
- ▶ What is the relationship between the numerator and denominator in a half?
- ▶ Is 1 half of 2?
- ▶ Is the numerator half of the denominator?
- ▶ If a half and 2 quarters and 4 eighths are the same size on a fraction wall, and the relationship between the numerator and denominator is the same in all three fractions, are a half and 2 quarters and 4 eighths equivalent fractions?
- ▶ Are equivalent fractions in the same place on a number line?
- ▶ Let's continue placing eighths on our number line, looking for equivalent



Select 4 eighths, 2 quarters from the fraction wall, for example,

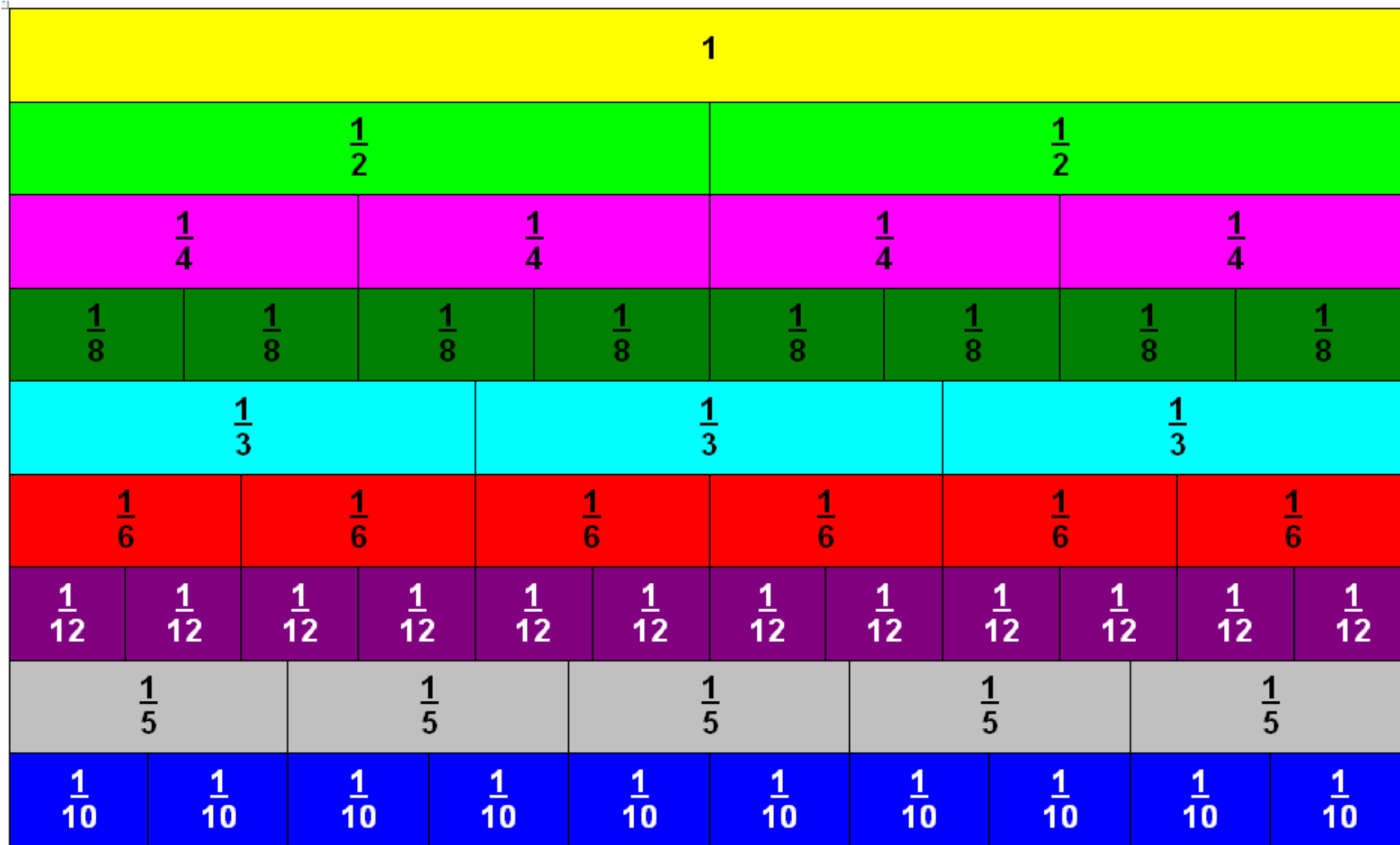


fractions.

- ▶ Are 6 eighths and 3 quarters all in the same place on the number line?
- ▶ Why?
- ▶ Are 6 eighths and 3 quarters equivalent?
- ▶ Could we check if 6 eighths and 3 quarters are equivalent using our fraction wall?
- ▶ Could we check if 6 eighths and 3 quarters are equivalent using the relationship between the numerators and denominators?
  
- ▶ What is the relationship between the numerator and denominator in 6 eighths?
- ▶ Is 6 three-quarters of 8, because 2 is one-quarter of 8, so 4 is two-quarters of eight?
- ▶ Is the numerator three-quarters of the denominator?
- ▶ What is the relationship between the numerator and denominator in 3 quarters?
- ▶ Is 3 three-quarters of 4?
- ▶ Is the numerator three-quarters of the denominator?
  
- ▶ If 3 quarters and 6 eighths are the same size on a fraction wall, and the relationship between the numerator and denominator is the same in both fractions, are 3 quarters and 6 eighths equivalent fractions?
- ▶ Are equivalent fractions in the same place on a number line?
  
- ▶ Are 8 eighths, 4 quarters, 2 halves and 1 all in the same place on the number line?
- ▶ Is 8 eighths equivalent to 4 quarters, 2 halves and 1?
- ▶ Is the numerator and denominator the same in 8 eighths?

- ▶ When the numerator and denominator are the same, is the fraction equivalent to 1?
- ▶ Do 8 eighths and 4 quarters and 2 halves have the same relationship between the numerator and the denominator?
- ▶ Is 2 all of 2? And is 4 all of 4? And is 8 all of 8?

Repeat this strategic questioning as children investigate equivalence while placing fifths, tenths on a number line, thirds and sixths on a number line, and halves, sixths, quarters, thirds, and twelfths on a number line between zero and 1 explaining that equivalent fractions are in the same place on a number line.



$\frac{1}{2}$	$\frac{2}{2}$	$\frac{1}{3}$	$\frac{2}{3}$
$\frac{3}{3}$	$\frac{1}{4}$	$\frac{2}{4}$	$\frac{3}{4}$
$\frac{4}{4}$	$\frac{1}{5}$	$\frac{2}{5}$	$\frac{3}{5}$
$\frac{4}{5}$	$\frac{5}{5}$	$\frac{1}{6}$	$\frac{2}{6}$

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



$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$
$\frac{9}{10}$	$\frac{10}{10}$	$\frac{1}{12}$	$\frac{2}{12}$
$\frac{3}{12}$	$\frac{4}{12}$	$\frac{5}{12}$	$\frac{6}{12}$
$\frac{7}{12}$	$\frac{8}{12}$	$\frac{9}{12}$	$\frac{10}{12}$
$\frac{11}{12}$	$\frac{12}{12}$	0	1