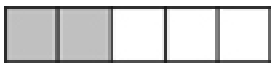
NAEP Released Items Aligned to the Iowa Core

3.NF.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

Brett needs to cut a piece of string into four equal pieces without using a ruler or other measuring instrument. Write directions to tell Brett how to do this.

1996-4-12-8

Source: National Assessment of Educational Progress, 1996, Grade 4 Mathematics Assessment.



What fraction of the figure is shaded?

2007-4-7-6

Source: National Assessment of Educational Progress, 2007, Grade 4 Mathematics Assessment.

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1. What fraction of the group of umbrellas is closed?

A. $\frac{1}{3}$

B. $\frac{3}{7}$

C. $\frac{4}{7}$

D. $\frac{3}{4}$

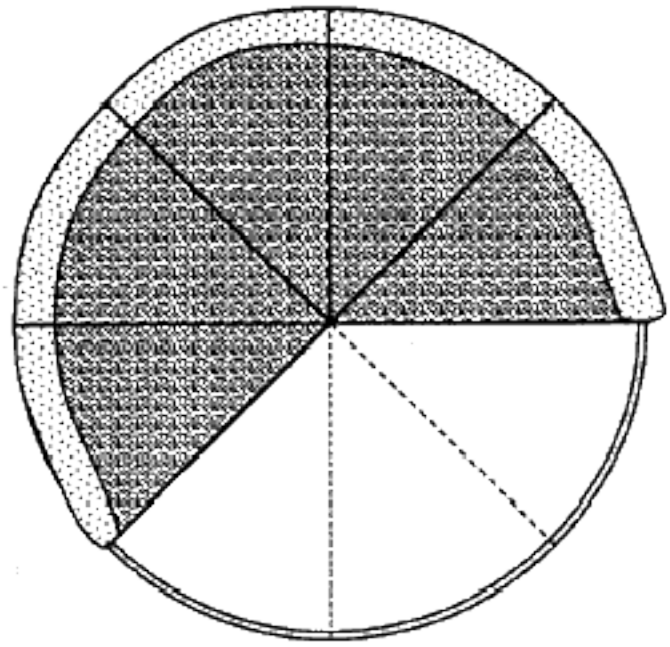
2007-4-9-4

Source: National Assessment of Educational Progress, 2007, Grade 4 Mathematics Assessment.

How many fourths make a whole?

1996-4-9-1

Source: National Assessment of Educational Progress, 1996, Grade 4 Mathematics Assessment.



The figure above shows that part of a pizza has been eaten. What part of the pizza is still there?

A. $\frac{3}{8}$

B. $\frac{3}{5}$

C. $\frac{5}{8}$

D. $\frac{5}{3}$

1990-4-9-8

Source: National Assessment of Educational Progress, 1990, Grade 4 Mathematics Assessment.

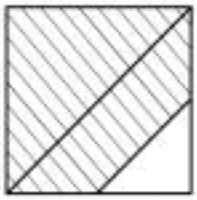
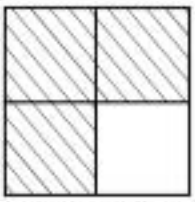
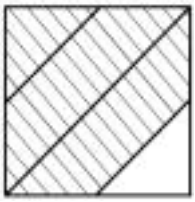
How many fifths are equal to one whole?

A. $\frac{1}{5}$
B. 1
C. 4
D. 5

2008-9-21-17

Source: National Assessment of Educational Progress, 2008, Age 9 Mathematics Assessment.

Which shows 3/4 of the picture shaded?

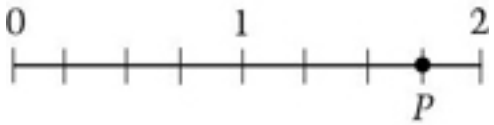
A.
B. 
C. 
D. 

2003-4-6-2
2003-8-6-2

Source: National Assessment of Educational Progress, 2003, Grade 4 and Grade 8 Mathematics Assessments.

3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.

a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.



On the number line, what number does *P* represent?

A. $\frac{2}{3}$

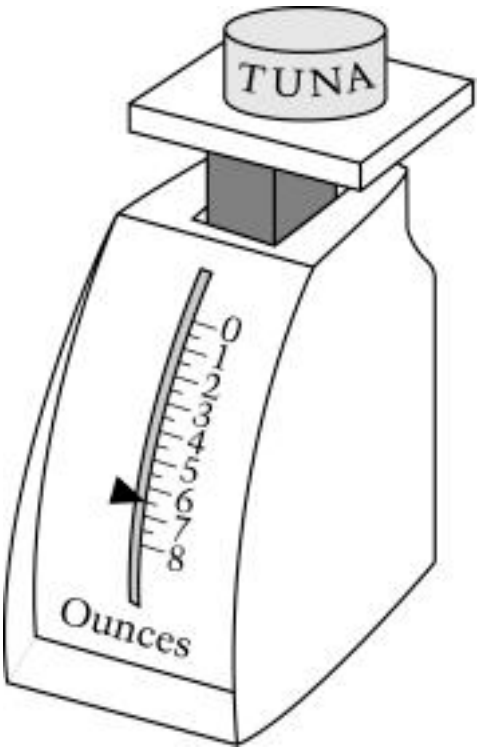
B. $\frac{3}{4}$

C. $1\frac{2}{3}$

D. $1\frac{3}{4}$

2009-4-10-7

Source: National Assessment of Educational Progress, 2009, Grade 4 Mathematics Assessment.



According to the indicator on the scale above, what is the weight in ounces of the can of tuna on the scale?

2003-8-7-4

Source: National Assessment of Educational Progress, 2003, Grade 8 Mathematics Assessment.

On the portion of the number line below, a dot shows where 1/2 is. Use another dot to show where 3/4 is.

2003-4-6-16
2003-8-6-16

Source: National Assessment of Educational Progress, 2003, Grade 4 and Grade 8 Mathematics Assessments.

3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.
c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.
d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

$\frac{4}{8}$ $\frac{25}{50}$ $\frac{5}{10}$

These three fractions are equivalent. Give <u>two</u> more fractions that are equivalent to these.

2007-4-9-11

Source: National Assessment of Educational Progress, 2007, Grade 4 Mathematics Assessment.

Mark says $\frac{1}{4}$ of his candy bar is smaller than $\frac{1}{5}$ of the same candy bar.

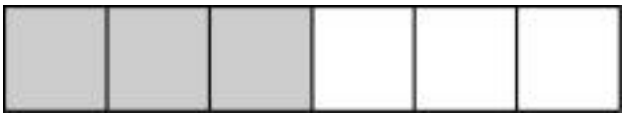
Is Mark right? ⬭ Yes ⬭ No

Draw a picture or use words to explain why you think Mark is right or wrong.

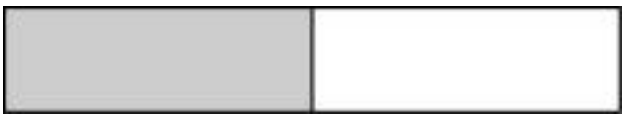
2007-4-9-18

Source: National Assessment of Educational Progress, 2007, Grade 4 Mathematics Assessment.

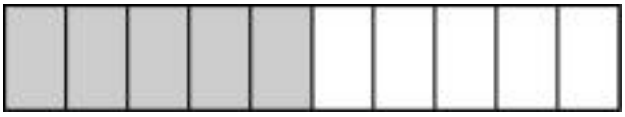
The shaded part of each strip below shows a fraction.

A. 

This fraction strip shows 3/6.

B. 

What fraction does this fraction strip show? _____

C. 

What fraction does this fraction strip show? _____

What do the fractions shown in A, B, and C have in common?

Shade in the fraction strips below to show two different fractions that are equivalent to the ones shown in A, B, and C.

1996-4-9-5

Source: National Assessment of Educational Progress, 1996, Grade 4 Mathematics Assessment.

Think carefully about the following question. Write a complete answer. You may use drawings, words, and numbers to explain your answer. Be sure to show all of your work.

José ate ½ of a pizza.
Ella ate ½ of another pizza.

José said that he ate more pizza than Ella, but Ella said they both ate the same amount. Use words and pictures to show that José could be right.

1992-4-7-10

Source: National Assessment of Educational Progress, 1992, Grade 4 Mathematics Assessment.

In a bag of marbles, ½ are red, ¼ are blue, 1/6 are green, and 1/12 are yellow. If a marble is taken from the bag without looking, is it most likely to be

A. red
B. blue
C. green
D. yellow

1992-4-5-16
1992-8-5-16

Source: National Assessment of Educational Progress, 1992, Grade 4 and 8 Mathematics Assessments.

A recipe requires $1\frac{1}{3}$ cups of sugar. Which of the following ways describes how the measuring cups shown can be used to measure $1\frac{1}{3}$ cups of sugar accurately?

A. Use the $\frac{1}{2}$ cup three times.

B. Use the $\frac{1}{4}$ cup three times.

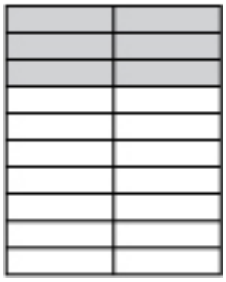
C. Use the $\frac{1}{2}$ cup twice and the $\frac{1}{3}$ cup once.

D. Use the $\frac{1}{3}$ cup twice and the $\frac{1}{2}$ cup once.

E. Use the $\frac{1}{4}$ cup once, the $\frac{1}{3}$ cup once, and the $\frac{1}{2}$ cup once.

2011-8-9-1

Source: National Assessment of Educational Progress, 2011, Grade 8 Mathematics Assessment.



What fraction of the figure above is shaded?

A. $\frac{1}{4}$

B. $\frac{3}{10}$

C. $\frac{1}{3}$

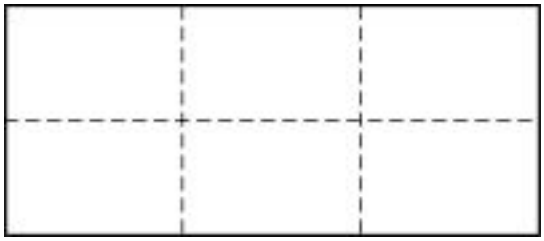
D. $\frac{3}{7}$

E. $\frac{7}{10}$

2007-8-11-3

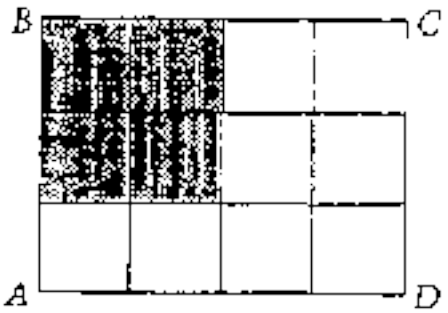
Source: National Assessment of Educational Progress, 2007, Grade 8 Mathematics Assessment.

Shade $\frac{1}{3}$ of the rectangle below.



2005-8-3-9

Source: National Assessment of Educational Progress, 2005, Grade 8 Mathematics Assessment.



In the figure above, what fraction of rectangle *ABCD* is shaded?

A. $\frac{1}{6}$

B. $\frac{1}{5}$

C. $\frac{1}{4}$

D. $\frac{1}{3}$

E. $\frac{1}{2}$

1996-8-3-2

Source: National Assessment of Educational Progress, 1996, Grade 8 Mathematics Assessment.