

MEASURING TO NEAREST EIGHTH

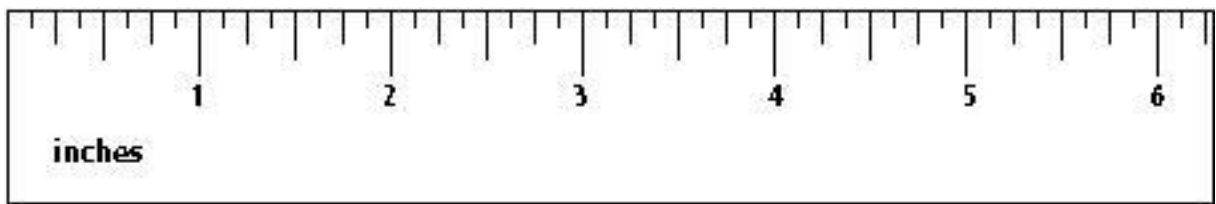
Often times we need to measure with a ruler or yardstick to find the length. We will review how to read a ruler and measure to the nearest eighth of an inch.

EQUIVALENT FRACTIONS AND DECIMALS

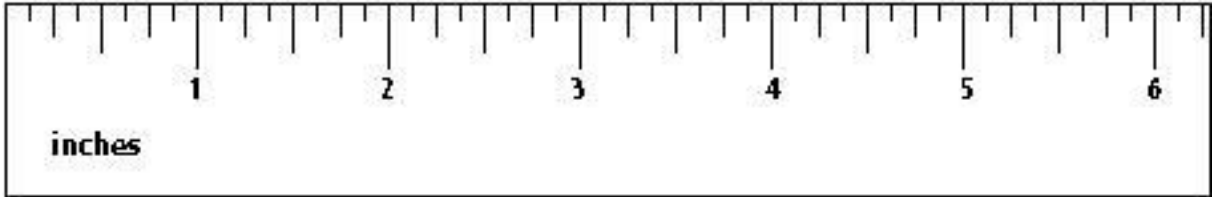
Decimals and fractions are connected. When converting fractions to decimals, the results may be a terminal or a repeating decimal. Terminal means the decimal terminates or ends. Repeating means the decimal will continue on forever in a repeating pattern of numbers. We will practice writing fractions as decimals.

To check equivalence of fractions, we can use a process called cross multiplication to test for equivalence. We will look at the connection between equivalent fractions and their cross products.

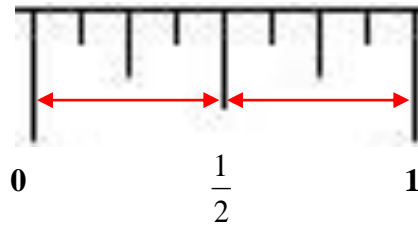
Ruler



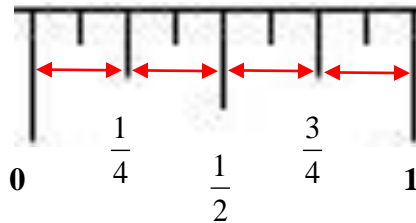
Measuring to the Nearest Eighth



Let's look closely at the ruler between 0 and 1. We locate $\frac{1}{2}$ by dividing the length into two equal parts.

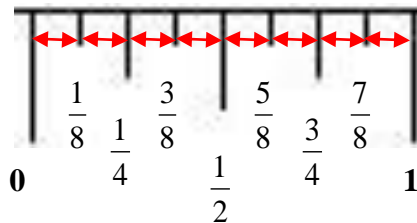


We locate $\frac{1}{4}$ and $\frac{3}{4}$ by dividing the length into four equal parts.



Note: We use $\frac{1}{2}$ instead of $\frac{2}{4}$ since $\frac{2}{4}$ simplifies to $\frac{1}{2}$.

We locate $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, and $\frac{7}{8}$ by dividing the length into eight equal parts.

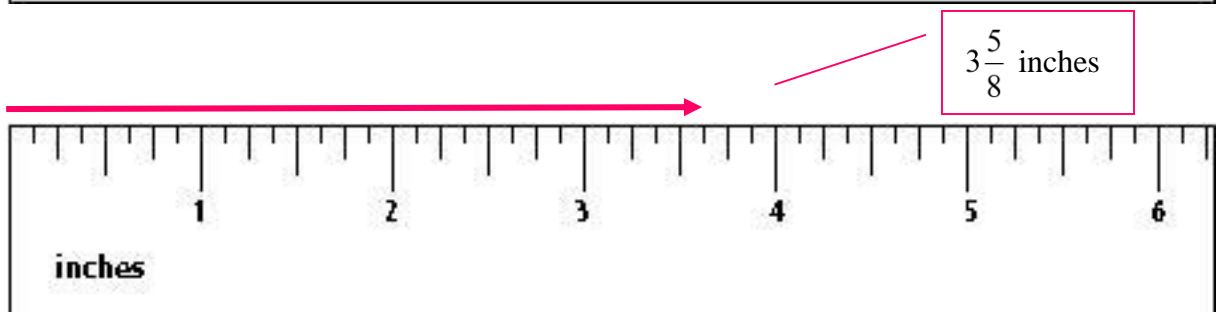
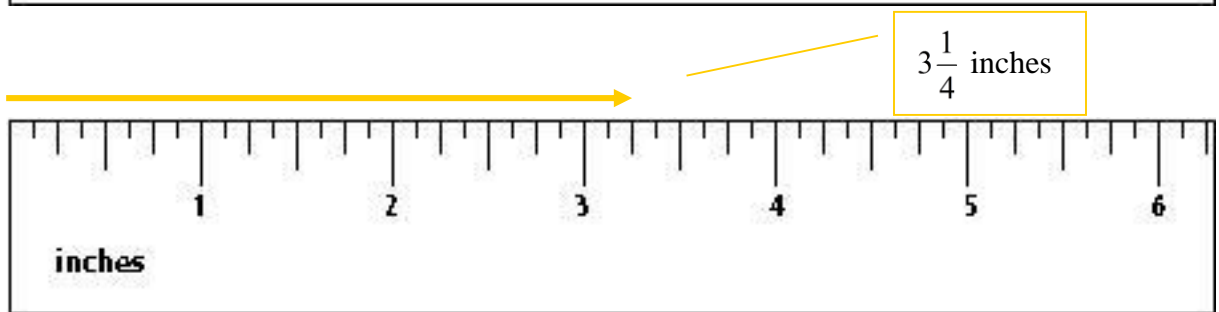
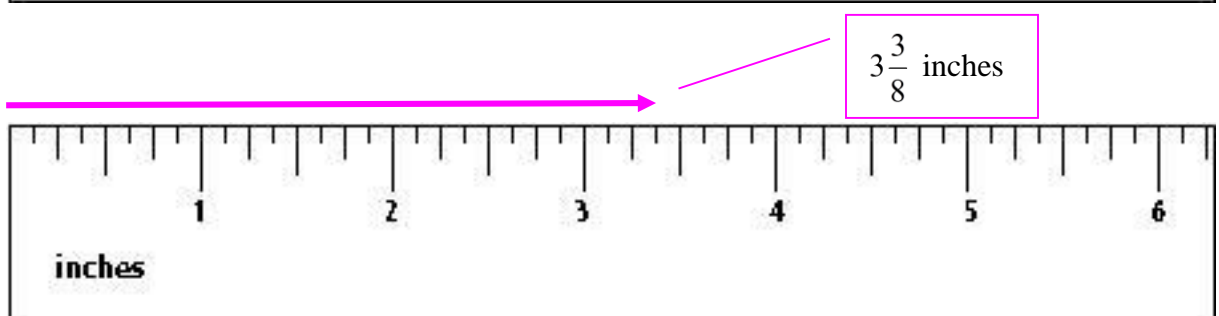
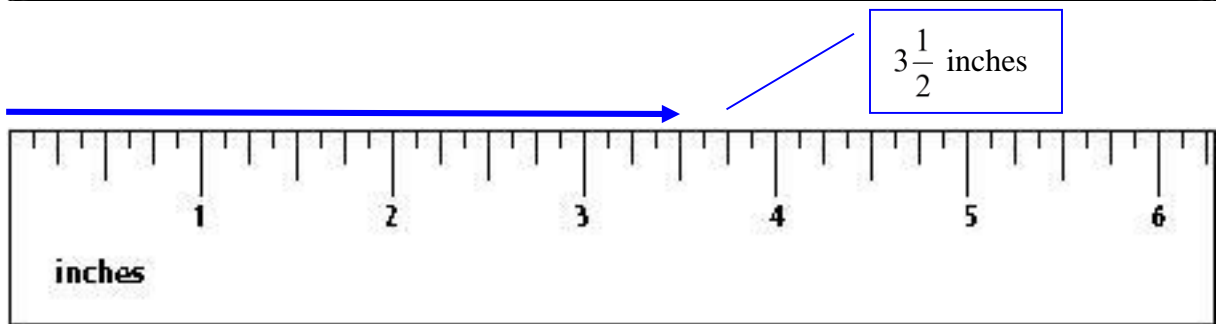
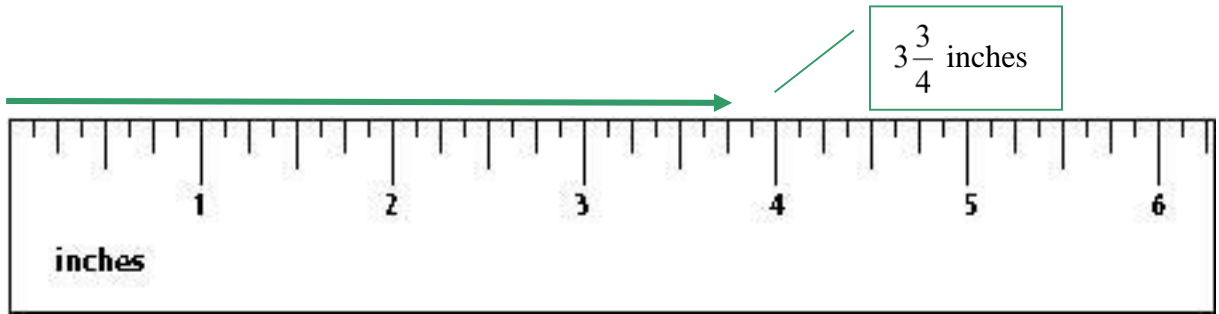
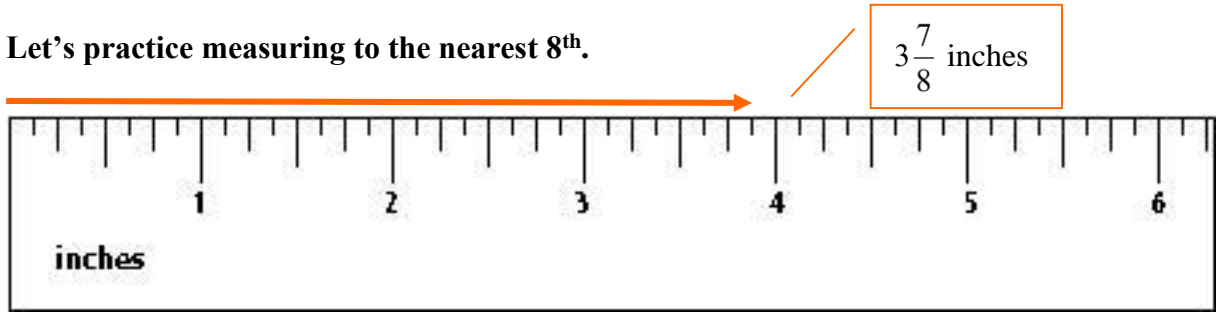


Note: We use $\frac{1}{4}$ instead of $\frac{2}{8}$ since $\frac{2}{8}$ simplifies to $\frac{1}{4}$.

We use $\frac{1}{2}$ instead of $\frac{4}{8}$ since $\frac{4}{8}$ simplifies to $\frac{1}{2}$.

We use $\frac{3}{4}$ instead of $\frac{6}{8}$ since $\frac{6}{8}$ simplifies to $\frac{3}{4}$.

Let's practice measuring to the nearest 8th.



Writing Fractions as Decimals

When expressing fractions as decimals, there are two types of decimals that occur, **terminal** and **repeating** decimals. **Terminal** decimals are decimals that come out **even**. **Repeating** decimals are decimals that create a pattern and **continue on forever**.

Terminal Decimals

Express $\frac{3}{8}$ as a decimal.

$$\begin{array}{r} .375 \\ 8 \overline{) 3.000} \\ \underline{24} \\ 60 \\ \underline{56} \\ 40 \\ \underline{40} \end{array}$$

To convert a fraction to a decimal, **divide the numerator** (top number of a fraction) **by the denominator** (bottom number of a fraction).

3 is a whole number; therefore, **3**, written as a decimal, is **3.000**. Once you place the decimal point after the **3**, you may add zeros as needed. In this case, three zeros are needed for the division to come out even.

Repeating Decimals

Express $\frac{8}{11}$ as a decimal.

$$\begin{array}{r} .7272 \\ 11 \overline{) 8.0000} \\ \underline{77} \\ 30 \\ \underline{22} \\ 80 \\ \underline{77} \\ 30 \\ \underline{22} \\ 8 \end{array}$$

8 is a whole number; therefore, **8**, written as a decimal, is **8.000**. Once you place the decimal point after the **8**, you may add zeros as needed. In this case, four zeros are needed to show that the decimal is a repeating pattern of 0.7272727272....

We will write this answer with a bar above the repeating pattern.

$$\frac{8}{11} = 0.\overline{72}$$

When requested, a repeating decimal can be rounded. This decimal, rounded to the nearest hundredth, is 0.73.

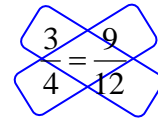
Equivalent Fractions and Cross Products

Equivalent fractions have a special connection, their cross products are equal.

Let's check out the cross products of these equivalent fractions:

$$\frac{3}{4} = \frac{9}{12}$$

Circle the numbers that are diagonal from each other.


$$\frac{3}{4} = \frac{9}{12}$$

Find the products of these numbers.

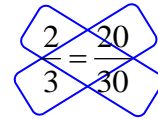
$$3 \times 12 = 36$$

$$4 \times 9 = 36$$

Let's check another set of equivalent fractions.

$$\frac{2}{3} = \frac{20}{30}$$

Circle the numbers that are diagonal from each other.


$$\frac{2}{3} = \frac{20}{30}$$

Find the products of these numbers.

$$2 \times 30 = 60$$

$$3 \times 20 = 60$$

When finding these cross products, we call the process, cross multiplication.