

**Math 10-3**

Name: \_\_\_\_\_

**Part A: Metric System (SI measurement)**

**Outcome:** Identify the base units of measurement in the SI system and match prefixes with the powers of 10.

**Outcome:** Write a given linear measurement expressed in one SI unit in another SI unit.

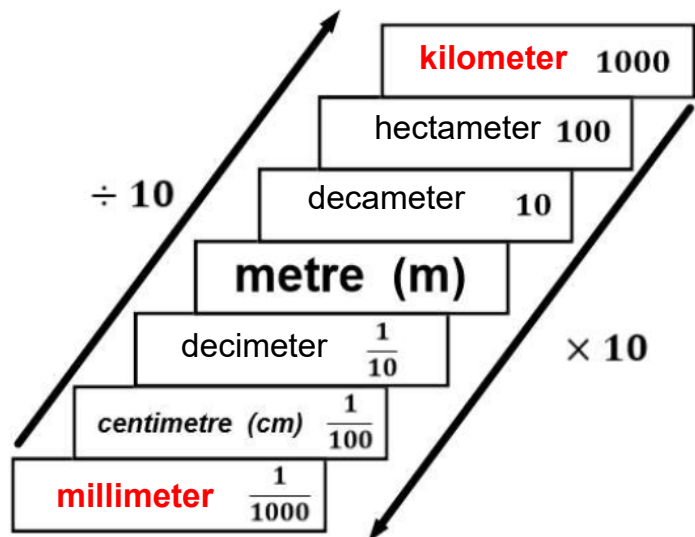
**Working Together:**

1. Research: Where and Why was the Metric System created?

**In France after the French Revolution the country had 400 different ways to measure land. They needed one standard unit of measurement.**

2. The base unit of measurement in SI is the metre.

Find the prefixes and write the units that match each power of 10 on the metric stairs; centimetre is given an example.



One method of converting between

units of metric measurement is to multiply or divide by 10 for each stair changed.

Example: Convert 1.25 km into meters.

We move down three stairs; we multiply 1.25 by 10 three times.

**1.25 km = 1.25 × 10 × 10 × 10 = 1250 m**

Example: Convert 750 cm into meters.

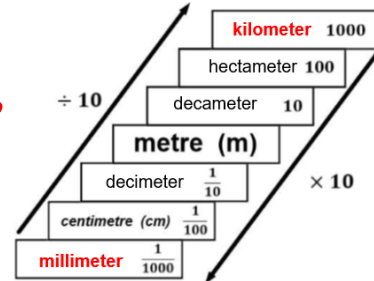
We move up two stairs; we divide 750 by 10 two times.

**750 cm = 750 ÷ 10 ÷ 10 = 7.5 m**

Lesson 1: Units of Measurement

3. Convert between SI units of measurement:

- a) 625 mm = 0.625 m *up 3 stairs ÷ 10 ÷ 10 ÷ 10*
- down 1 × 10* b) 75 cm = 750 mm
- c) 12500 cm = 0.125 km *÷ 10 ÷ 10 ÷ 10 ÷ 10 ÷ 10*
- d) 0.25 km = 250 m *× 10 × 10 × 10*
- e) 1500 mm = 0.0015 km  
*÷ 10 ÷ 10 ÷ 10 ÷ 10 ÷ 10 ÷ 10 = 0.0015 km*



Practice: [Metric Conversion Sheet](#)

Part B: Imperial System

**Outcome:** Convert linear measurements expressed in one Imperial unit in another Imperial unit.

**Measurement Relationships :**

- 1 mile = 5280 feet
- 1 yard = 3 feet
- 1 foot = 12 inches

**Working Together: Convert between Imperial units of measurement (Ratios work great with Imperial)**

1. Feet to Inches and/or Inches to Feet.

- $\frac{1 \text{ ft}}{12 \text{ in}} = \frac{3 \text{ ft}}{x}$
- a) 3 feet = 36 inches
- b) 8 feet = 96 inches  *$\frac{1' = 12''}{12'' = \frac{8}{x}}$*
- c) 72 inches = 6 feet  *$\frac{\text{ft}}{\text{in}} \frac{1}{12} = \frac{x}{72}$*
- d) 156 inches = 13 feet  *$\frac{1}{12} = \frac{x}{156}$*

Lesson 1: Units of Measurement

2. Feet and Inches to Inches. Change Feet to Inches, add the extra inches.

a) 6 feet 2 inches = 74 inches  $\frac{1}{12} = \frac{6}{x}$   $x=72$

$72+2$

b) 5 feet 7 inches = 67 inches  $\frac{1}{12} = \frac{5}{x}$   $x=60$

$60+7$

3. Inches to Feet & Inches. How many whole feet; how many inches are whole feet?

What are the extra inches?

a) 29 inches = 2 feet and 5 inches  
 $2 \times 12 = 24$   
5

$\frac{1}{12} = \frac{x}{29}$   
 $x = 2.4167$

b) 75 inches = 6 feet and 3 inches  
 $6 \times 12 = 72$   
3

$\frac{1}{12} = \frac{x}{75}$   
 $x = 6.25$

c) 150 inches = 12 feet and 6 inches  
 $12 \times 12 = 144$   
6

$\frac{1}{12} = \frac{x}{150}$   
 $x = 12.5$

4. Other Imperial Conversions.

a) 6 feet = 2 yards  $\frac{1 \text{ yd}}{3 \text{ ft}} = \frac{x}{6 \text{ ft}}$

b) 2.5 miles = 13200 feet = 4400 yards  $\frac{1 \text{ mile}}{5280 \text{ ft}} = \frac{2.5}{x}$   $\frac{1}{3} = \frac{x}{13200}$   $x=4400$

c) 2200 yards = 1.25 miles  $\frac{1 \text{ yd}}{3 \text{ ft}} = \frac{2200}{x}$   $x=6600 \text{ ft}$

$\frac{1 \text{ mile}}{5280 \text{ ft}} = \frac{x}{6600}$

Practice: [Imperial Conversion Sheet](#)

Lesson 1: Units of Measurement

**Part C: Fraction Skills**

**Outcome:** Perform the four arithmetic operations on fractions with and without technology.

**Working Together:** The Imperial System has difficult conversion ratios (they do not round off to nice decimals). As a result it is common practice to use fractions when working with the Imperial System.

1 yard = 3 feet  
1 foot = 12 inches

What Fraction Skills do we have? Equivalent Fractions. Adding and Subtracting Fractions.

1. Express fractions in their simplest form. **divide equally**

a)  $\frac{12}{16} = \frac{6}{8} = \frac{3}{4}$        $\frac{12 \div 4}{16 \div 4} = \frac{3}{4}$

b)  $\frac{36}{48} \begin{matrix} \div 12 \\ \div 12 \end{matrix} = \frac{3}{4}$

2. Order the fractions from smallest to largest (common denominators). **multiply equally**

a)  $\frac{3}{4} \begin{matrix} \times 3 \\ \times 3 \end{matrix} \frac{7}{12} \frac{2}{3} \begin{matrix} \times 4 \\ \times 4 \end{matrix} \frac{7}{12} \frac{10}{12} \frac{9}{12}$   
 $\frac{7}{12} \frac{10}{12} \frac{9}{12}$   
 $\frac{7}{12} \frac{10}{12} \frac{9}{12}$

b)  $\frac{5}{8} \begin{matrix} \times 2 \\ \times 2 \end{matrix} \frac{3}{4} \begin{matrix} \times 4 \\ \times 4 \end{matrix} \frac{11}{16}$        $\frac{10}{16} \frac{11}{16} \frac{12}{16}$

**Same size**

3. Add and Subtract Fractions:

a)  $\frac{3}{8} + \frac{1}{8} = \frac{4}{8} \begin{matrix} \div 2 \\ \div 2 \end{matrix} = \frac{2}{4} \begin{matrix} \div 2 \\ \div 2 \end{matrix} = \frac{1}{2}$

**"8"**

b)  $\frac{5}{8} - \frac{1}{2} \begin{matrix} \times 4 \\ \times 4 \end{matrix} = \frac{5}{8} - \frac{4}{8} = \frac{1}{8}$

**"12"**

c)  $\frac{5}{6} \begin{matrix} \times 2 \\ \times 2 \end{matrix} - \frac{3}{4} \begin{matrix} \times 3 \\ \times 3 \end{matrix} = \frac{10}{12} - \frac{9}{12} = \frac{1}{12}$

**"24"**

d)  $\frac{7}{8} \begin{matrix} \times 3 \\ \times 3 \end{matrix} + \frac{2}{3} \begin{matrix} \times 8 \\ \times 8 \end{matrix} = \frac{21}{24} + \frac{16}{24} = \frac{37}{24}$

Practice: [Fraction Sheet](#)