

UNITS OF MEASUREMENTS

HANDOUT

Liquids:

1 cup = ounces (oz)

1 pint = cups (c)

= ounces

1 quart = pints (pt)

= cups

= ounces

1 gallon = quarts (qt)

(gal) = pints

= cups

= ounces

Lengths:

1 foot = inches (in)

1 yard = feet (ft)

(yd) = inches

1 mile = feet

(mi)

1 meter = centimeters (cm)

=

millimeters (mm)

=

decimeters

1 kilometer = meters (m)

(km)

1 inch = centimeters

CONVERSIONS: Lengths and Liquids

NOTE: The conversion factors we will be concentrating on for length are:

$$12 \text{ inches} = 1 \text{ foot}$$

$$3 \text{ feet} = 1 \text{ yard}$$

$$5,280 \text{ feet} = 1 \text{ mile}$$

$$2.54 \text{ centimeters} = 1 \text{ inch}$$

↳ EXAMPLE 1:

How many inches are in 6 yards?

We need to convert 6 yards into inches. First we begin with the ratio

$$\left(\frac{6 \text{ yards}}{1} \right)$$

(the 1 in the denominator is a place holder)

Now we need to multiply this ratio by a conversion factor.

We need a conversion from _____ to

The _____ need to be in the denominator so that they will cancel with the units in the numerator of our ratio.

$$\left(\frac{6 \text{ yards}}{1} \right) \cdot \left(\frac{\quad}{\quad} \right)$$

At this point, our units are in _____,
so we must multiply by another conversion
factor.

We need a conversion from _____ to
_____.

$$\left(\frac{6 \text{ yards}}{1} \right) \left(\frac{\quad}{\quad} \right) \left(\frac{\quad}{\quad} \right)$$

= _____

Let the units guide you to which conversion
factor you need!

↳ EXAMPLE 2:

convert 5 miles to centimeters.

$$\left(\quad \right) \left(\quad \right) \left(\quad \right) \left(\quad \right)$$

= _____

NOTE: multiply all numbers on top and divide
all numbers on bottom.



EXAMPLE 3:

How many miles are in 400,000 inches?
(Round to two decimal places)

NOTE: The conversion factors we will be
concentrating on for liquid are:

$$1 \text{ pint} = 16 \text{ fluid ounces}$$

$$1 \text{ quart} = 2 \text{ pints}$$

$$1 \text{ gallon} = 4 \text{ quarts}$$

↳ EXAMPLE 4:
How many gallons are in 256
pints?

↳ EXAMPLE 5:
Convert 32 gallons to fluid ounces.

CONVERSIONS: LIQUIDS & LENGTHS Practice Problems

Make the following conversions:

1. 3,500,000 inches to miles.

2. 40 yards to centimeters

3. 12 pints to quarts

4. 19 gallons to fluid ounces

CONVERSIONS: AREA & VOLUME

- 12 inches = 1 foot
- 3 feet = 1 yard
- 5,280 feet = 1 mile
- 2.54 centimeters = 1 inch

AREA:

consider the equation

$$12 \text{ inches} = 1 \text{ foot}$$

If we square both sides of the equation,
we get:

=

By this reasoning, how many ft^2 are
in 1 yd^2 ?

$$\underline{\hspace{2cm}} \text{ ft} = \underline{\hspace{2cm}} \text{ yd}$$

so,

$$\underline{\hspace{2cm}} \text{ ft}^2 = \underline{\hspace{2cm}} \text{ yd}^2$$

↳

EXAMPLE 1:

convert 8 yd^2 to cm^2 .

VOLUME:

How do we obtain a conversion factor for
units of volume?

$$12 \text{ inches} = 1 \text{ foot}$$

$$\underline{\hspace{2cm}} \text{ in}^2 = \underline{\hspace{2cm}} \text{ ft}^2$$

and

$$\underline{\hspace{2cm}} \text{ in}^3 = \underline{\hspace{2cm}} \text{ ft}^3$$

Similarly,

$$3 \text{ ft} = 1 \text{ yd}$$

$$\underline{\hspace{2cm}} \text{ ft}^2 = \underline{\hspace{2cm}} \text{ yd}^2$$

$$\underline{\hspace{2cm}} \text{ ft}^3 = \underline{\hspace{2cm}} \text{ yd}^3$$

↳

Example 2:

convert $1,000 \text{ in}^3$ to yd^3

CONVERSIONS: Area & Volume Practice Problems

make the following conversions:

1. $100 \text{ yd}^3 \text{ to } \text{in}^3$

2. $5,000,000 \text{ cm}^2 \text{ to } \text{yd}^2$

CONVERSIONS: MIXED UNITS

↳

EXAMPLE 1:

convert 50 miles per hour to feet per second

$$\left(\frac{50 \text{ mi}}{1 \text{ hr}} \right) (\quad) (\quad) (\quad)$$

=

↳

EXAMPLE 2:

convert 1,000 cm per second to miles per hour.

↳

EXAMPLE 3:

Convert 60 mph to yards per second.

CONVERSIONS: MIXED UNITS PRACTICE PROBLEMS

1. convert $65 \frac{\text{MILES}}{\text{hr}}$ to $\frac{\text{feet}}{\text{sec}}$

2. convert $40,000 \frac{\text{cm}}{\text{sec}}$ to $\frac{\text{miles}}{\text{hr}}$