Converting Units of Measure

Measurement

Student/Class Goal
Students will use measurement units to solve problems and convert between measurement systems.

Outcome (*lesson objective)*
Given a unit of measurement, students will be able to convert it to other units of measurement and will be able to use it to solve contextual problems.

Time Frame
4 hours

Standard *Use Math to Solve Problems and Communicate*

NRS EFL 6

Components of Performance (COPs)	**Activity Addresses COPs** (process)
Understand, interpret, and work with pictures, numbers, and symbolic information.	Students will understand when to use each unit of measurement.
Apply knowledge of mathematical concepts and procedures to figure out how to answer a question, solve a problem, make a prediction, or carry out a task that has a mathematical dimension.	Students will use problem solving skills to know what unit that their answer should be in.
Define and select data to be used in solving the problem.	Students will the correct conversion factors to use when solving problems.
Determine the degree of precision required by the situation.	Students round their answers to the nearest hundredth when appropriate.
Solve problem using appropriate quantitative procedures and verify that the results are reasonable.	Students will label their answers with the appropriate unit and check over their work to verify their answer.
Communicate results using a variety of mathematical representations, including graphs, charts, tables, and algebraic models.	Students will make a table to list all of the conversion factors they might need.

Activity Addresses Benchmarks (content)
M.6.12, M.6.13, M.6.14, M.6.27, M.6.34, M.6.35

Materials
Measurement Unit Worksheets http://www.homeschoolmath.net/worksheets/measuring.php
Measurement Worksheets

Learner Prior Knowledge

- Adding, Subtracting, Multiplying, and Dividing Integers, Decimals, and Fractions
- Using measurement systems
- Problem Solving Skills

Instructional Activities

Step 1
Review different units of measure and when to use each one. Ask students which unit of measure you would use to find…:

- Length of a pencil?
- Distance from home plate to 2nd base?
- Distance between two cities?
- Time it takes to write your name?
- Time it takes to write a paragraph?
- Time it takes to take GED test?
- Time it takes to complete a college class?
- You do not have to ask these exact questions as long as you are making sure that students know what unit of measure is appropriate for different situations.

Step 2
Review how to round decimals to different places. Also discuss the difference between exact and

approximate values. For example, a fraction is an exact value and a rounded decimal is an approximate value.

Step 3
Teach students basic conversion factors.

- Teach students how to convert between inches, feet, yards, and miles (Customary units).
- Teach students how to convert between millimeters, centimeters, decimeters, meters, decameters, and kilometers (Metric units).
- Teach students how to convert between customary units and metric units.
- Teach students how to convert between seconds, minutes, hours, and days.
- Teach students how to convert between pounds, ounces, cups, pints, quarts, and gallons.

Step 4
In a group, or with a partner, students will practice converting between different units of measure.

Step 5
As a class, use units of measure to solve contextual problems. Label answers with the appropriate unit of measure.

Step 6
Have students work individually on solving word problems that involve units of measure.

Assessment/Evidence (*based on outcome)*
Informal assessment by monitoring group/partner discussion and work. Formally check students' individual work for process and accuracy. Assign additional practice if necessary.

Teacher Reflection/Lesson Evaluation
Not yet completed.

Next Steps

Common Weights and Measures
Length
Metric System
1 millimeter = 1/1,000 meter
1 centimeter = 1/100 meter
1 decimeter = 1/10 meter
1 meter (basic unit of length)
1 dekameter = 10 meters
1 kilometer = 1,000 meters
American and British Units
1 inch = 1/36 yard = 1/12 foot
1 foot = 1/3 yard
1 yard (basic unit of length)
1 mile = 1,760 yards = 5,280 feet
Conversion Factors
1 centimeter = 0.39 inch
1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 foot = 0.305 meter
1 meter = 3.28 feet
1 yard = 0.914 meter
1 meter = 1.094 yards
1 kilometer = 0.62 mile
1 mile = 1.609 kilometers
Volume and Capacity (Liquid and Dry)
Metric System
1 milliliter = 1/1,000 liter
1 centiliter = 1/100 liter
1 deciliter = 1/10 liter
1 dekaliter = 10 liters
1 hectoliter = 100 liters

Conversion Factors
1 milliliter = 0.034 fluid ounce
1 fluid ounce = 29.6 milliliters
1 U.S. quart = 0.946 liter
1 liter = 1.06 U.S. quarts
1 U.S. gallon = 3.8 liters

Measuring Worksheet 3

Convert the measuring units as indicated.

1a. 60 in = _____ ft

1b. 132 in = _____ ft

2a. 36 ft = _____ yd

2b. 24 ft = _____ yd

3a. 4 ft = _____ in

3b. 27 ft = _____ yd

4a. 2 yd = _____ ft

4b. 30 ft = _____ yd

5a. 5 yd = _____ ft

5b. 8 ft = _____ in

6a. 144 in = _____ ft

6b. 72 in = _____ ft

7a. 7 ft = _____ in

7b. 10 ft = _____ in

8a. 108 in = _____ ft

8b. 33 ft = _____ yd

9a. 3 ft = _____ in

9b. 6 yd = _____ ft

10a. 3 ft = _____ yd

10b. 21 ft = _____ yd

Answer Key for Measuring Worksheet 3

1a.	5 ft	1b.	11 ft
2a.	12 yd	2b.	8 yd
3a.	48 in	3b.	9 yd
4a.	6 ft	4b.	10 yd
5a.	15 ft	5b.	96 in
6a.	12 ft	6b.	6 ft
7a.	84 in	7b.	120 in
8a.	9 ft	8b.	11 yd
9a.	36 in	9b.	18 ft
10a.	1 yd	10b.	7 yd

Measuring Worksheet 4

Convert the measuring units as indicated.

1a. 10560 ft = _____ mi

1b. 21120 ft = _____ mi

2a. 8800 yd = _____ mi

2b. 5 mi = _____ ft

3a. 2 mi = _____ yd

3b. 5280 yd = _____ mi

4a. 4 mi = _____ yd

4b. 1 mi = _____ ft

5a. 1 mi = _____ yd

5b. 15840 ft = _____ mi

6a. 4 mi = _____ ft

6b. 4 mi = _____ ft

7a. 4 mi = _____ yd

7b. 3 mi = _____ yd

8a. 5 mi = _____ ft

8b. 8800 yd = _____ mi

9a. 4 mi = _____ ft

9b. 15840 ft = _____ mi

10a. 5 mi = _____ yd

10b. 7040 yd = _____ mi

Answer Key for Measuring Worksheet 4

1a.	2 mi	1b.	4 mi
2a.	5 mi	2b.	26400 ft
3a.	3520 yd	3b.	3 mi
4a.	7040 yd	4b.	5280 ft
5a.	1760 yd	5b.	3 mi
6a.	21120 ft	6b.	21120 ft
7a.	7040 yd	7b.	5280 yd
8a.	26400 ft	8b.	5 mi
9a.	21120 ft	9b.	3 mi
10a.	8800 yd	10b.	4 mi

Measuring Worksheet 9

Convert the measuring units as indicated.

1a. 4.875 mi = _____ yd

1b. 5940 yd = _____ mi

2a. 6600 yd = _____ mi

2b. 6820 yd = _____ mi

3a. 7920 ft = _____ mi

3b. 0.5 mi = _____ yd

4a. 21120 ft = _____ mi

4b. 3300 yd = _____ mi

5a. 3.75 mi = _____ ft

5b. 220 yd = _____ mi

6a. 5940 ft = _____ mi

6b. 8.625 mi = _____ ft

7a. 3.875 mi = _____ ft

7b. 40920 ft = _____ mi

8a. 4.125 mi = _____ yd

8b. 2.875 mi = _____ yd

9a. 2.125 mi = _____ yd

9b. 4.625 mi = _____ yd

10a. 8800 yd = _____ mi

10b. 4.25 mi = _____ yd

Answer Key for Measuring Worksheet 9

1a.	8580 yd	1b.	3.375 mi
2a.	3.75 mi	2b.	3.875 mi
3a.	1.5 mi	3b.	880 yd
4a.	4 mi	4b.	1.875 mi
5a.	19800 ft	5b.	0.125 mi
6a.	1.125 mi	6b.	45540 ft
7a.	20460 ft	7b.	7.75 mi
8a.	7260 yd	8b.	5060 yd
9a.	3740 yd	9b.	8140 yd
10a.	5 mi	10b.	7480 yd

Measuring Worksheet 5

Convert the measuring units as indicated.

1a. 5 pt = _____ C

1b. 5 gal = _____ qt

2a. 6 gal = _____ qt

2b. 32 qt = _____ gal

3a. 8 oz = _____ C

3b. 16 C = _____ pt

4a. 6 C = _____ pt

4b. 6 C = _____ oz

5a. 8 qt = _____ gal

5b. 7 gal = _____ qt

6a. 12 qt = _____ gal

6b. 6 pt = _____ C

7a. 3 C = _____ oz

7b. 8 C = _____ oz

8a. 5 C = _____ oz

8b. 14 C = _____ pt

9a. 1 pt = _____ C

9b. 16 oz = _____ C

10a. 4 C = _____ pt

10b. 32 oz = _____ C

Answer Key for Measuring Worksheet 5

1a.	10 C	1b.	20 qt
2a.	24 qt	2b.	8 gal
3a.	1 C	3b.	8 pt
4a.	3 pt	4b.	48 oz
5a.	2 gal	5b.	28 qt
6a.	3 gal	6b.	12 C
7a.	24 oz	7b.	64 oz
8a.	40 oz	8b.	7 pt
9a.	2 C	9b.	2 C
10a.	2 pt	10b.	4 C

Measuring Worksheet 10

Convert the measuring units as indicated.

1a. 500 cm = _____ m

1b. 10 km = _____ m

2a. 800 cm = _____ m

2b. 3000 m = _____ km

3a. 9 cm = _____ mm

3b. 6 cm = _____ mm

4a. 8 km = _____ m

4b. 4000 m = _____ km

5a. 7000 m = _____ km

5b. 1000 cm = _____ m

6a. 80 mm = _____ cm

6b. 5000 m = _____ km

7a. 1 m = _____ cm

7b. 10 cm = _____ mm

8a. 2 cm = _____ mm

8b. 2000 m = _____ km

9a. 300 cm = _____ m

9b. 200 cm = _____ m

10a. 900 cm = _____ m

10b. 30 mm = _____ cm

Answer Key for Measuring Worksheet 10

1a.	5 m	1b.	10000 m
2a.	8 m	2b.	3 km
3a.	90 mm	3b.	60 mm
4a.	8000 m	4b.	4 km
5a.	7 km	5b.	10 m
6a.	8 cm	6b.	5 km
7a.	100 cm	7b.	100 mm
8a.	20 mm	8b.	2 km
9a.	3 m	9b.	2 m
10a.	9 m	10b.	3 cm

Measuring Worksheet 11

Convert the measuring units as indicated.

1a. 1877 m = _____ km

1b. 1333 m = _____ km

2a. 920 m = _____ km

2b. 139 m = _____ km

3a. 8236 m = _____ km

3b. 957 cm = _____ m

4a. 342 mm = _____ cm

4b. 400 cm = _____ m

5a. 827 cm = _____ m

5b. 9.91 m = _____ cm

6a. 8.509 km = _____ m

6b. 253 cm = _____ m

7a. 2.98 m = _____ cm

7b. 720 mm = _____ cm

8a. 8.036 km = _____ m

8b. 594 mm = _____ cm

9a. 0.245 km = _____ m

9b. 9.46 m = _____ cm

10a. 1.22 m = _____ cm

10b. 7.75 m = _____ cm

Answer Key for Measuring Worksheet 11

1a.	1.877 km	1b.	1.333 km
2a.	0.92 km	2b.	0.139 km
3a.	8.236 km	3b.	9.57 m
4a.	34.2 cm	4b.	4 m
5a.	8.27 m	5b.	991 cm
6a.	8509 m	6b.	2.53 m
7a.	298 cm	7b.	72 cm
8a.	8036 m	8b.	59.4 cm
9a.	245 m	9b.	946 cm
10a.	122 cm	10b.	775 cm

Measuring Worksheet 12

Convert the measuring units as indicated.

1a. 2000 g = _____ kg

1b. 9 L = _____ ml

2a. 1000 g = _____ kg

2b. 8000 g = _____ kg

3a. 10 L = _____ ml

3b. 6000 ml = _____ L

4a. 4 L = _____ ml

4b. 4 kg = _____ g

5a. 10 kg = _____ g

5b. 1 L = _____ ml

6a. 5000 ml = _____ L

6b. 6000 g = _____ kg

7a. 3 kg = _____ g

7b. 7 kg = _____ g

8a. 3000 ml = _____ L

8b. 9000 g = _____ kg

9a. 2000 ml = _____ L

9b. 5 kg = _____ g

10a. 7000 ml = _____ L

10b. 8000 ml = _____ L

Answer Key for Measuring Worksheet 12

1a.	2 kg	1b.	9000 ml
2a.	1 kg	2b.	8 kg
3a.	10000 ml	3b.	6 L
4a.	4000 ml	4b.	4000 g
5a.	10000 g	5b.	1000 ml
6a.	5 L	6b.	6 kg
7a.	3000 g	7b.	7000 g
8a.	3 L	8b.	9 kg
9a.	2 L	9b.	5000 g
10a.	7 L	10b.	8 L

Measuring Worksheet 13

Convert the measuring units as indicated.

1a. 0.225 kg = _____ g

1b. 5.879 kg = _____ g

2a. 8.201 kg = _____ g

2b. 9.059 L = _____ ml

3a. 8.798 kg = _____ g

3b. 5600 g = _____ kg

4a. 0.21 L = _____ ml

4b. 8.173 L = _____ ml

5a. 404 ml = _____ L

5b. 9.704 L = _____ ml

6a. 4649 ml = _____ L

6b. 118 g = _____ kg

7a. 4395 g = _____ kg

7b. 9748 ml = _____ L

8a. 8849 g = _____ kg

8b. 5913 g = _____ kg

9a. 1.104 kg = _____ g

9b. 6428 g = _____ kg

10a. 7540 g = _____ kg

10b. 9924 g = _____ kg

Answer Key for Measuring Worksheet 13

1a.	225 g	1b.	5879 g
2a.	8201 g	2b.	9059 ml
3a.	8798 g	3b.	5.6 kg
4a.	210 ml	4b.	8173 ml
5a.	0.404 L	5b.	9704 ml
6a.	4.649 L	6b.	0.118 kg
7a.	4.395 kg	7b.	9.748 L
8a.	8.849 kg	8b.	5.913 kg
9a.	1104 g	9b.	6.428 kg
10a.	7.54 kg	10b.	9.924 kg

Measuring Worksheet 15

Convert the measuring units as indicated.

1a. 2.25 gal = _____ qt

1b. 52140 ft = _____ mi

1c. 1.336 gal = _____ oz

2a. 4.453 km = _____ m

2b. 24 oz = _____ qt

2c. 5 C = _____ oz

3a. 103 in = _____ ft

3b. 3 pt = _____ qt

3c. 72 oz = _____ qt

4a. 42 oz = _____ gal

4b. 3.5 qt = _____ C

4c. 5.8 T = _____ lb

5a. 1.3 T = _____ lb

5b. 5.875 C = _____ oz

5c. 2.25 lb = _____ oz

6a. 5078 m = _____ km

6b. 10300 lb = _____ T

6c. 0.875 qt = _____ oz

7a. 12 C = _____ qt

7b. 57 ft = _____ yd

7c. 7 pt = _____ qt

8a. 36300 ft = _____ mi

8b. 33 ft = _____ yd

8c. 8691 m = _____ km

9a. 3 gal = _____ qt

9b. 4.75 gal = _____ qt

9c. 3.625 C = _____ oz

10a. 750 cm = _____ m

10b. 312 oz = _____ gal

10c. 1.073 L = _____ ml

11a. 21.667 yd = _____ ft

11b. 2.125 mi = _____ yd

11c. 4180 yd = _____ mi

12a. 9.304 L = _____

12b. 6.625 C = _____ oz

12c. 14 in = _____ ft

ml

13a. 4 C = _____ pt

13b. 0.25 mi = _____ yd

13c. 36 oz = _____ qt

14a. 49 oz = _____ C

14b. 12 C = _____ pt

14c. 53 in = _____ ft

15a. 2 C = _____ oz

15b. 5.375 mi = _____ ft

15c. 8.17 km = _____ m

16a. 4.5 T = _____ lb

16b. 4 pt = _____ qt

16c. 2.5 qt = _____ pt

17a. 15 yd = _____ ft

17b. 48 oz = _____ C

17c. 6.22 m = _____ cm

18a. 4.625 lb = _____ oz

18b. 6.35 km = _____ m

18c. 2.5 gal = _____ qt

19a. 0.76 m = _____ cm

19b. 201 oz = _____ gal

19c. 11000 lb = _____ T

20a. 7.125 C = _____ oz

20b. 53.2 cm = _____ mm

20c. 3.099 L = _____ ml

Answer Key for Measuring Worksheet 15

1a. 9 qt	1b. 9.875 mi	1c. 171 oz
2a. 4453 m	2b. 0.75 qt	2c. 40 oz
3a. 8.583 ft	3b. 1.5 qt	3c. 2.25 qt
4a. 0.328 gal	4b. 14 C	4c. 11600 lb
5a. 2600 lb	5b. 47 oz	5c. 36 oz
6a. 5.078 km	6b. 5.15 T	6c. 28 oz
7a. 3 qt	7b. 19 yd	7c. 3.5 qt
8a. 6.875 mi	8b. 11 yd	8c. 8.691 km
9a. 12 qt	9b. 19 qt	9c. 29 oz
10a. 7.5 m	10b. 2.438 gal	10c. 1073 ml
11a. 65 ft	11b. 3740 yd	11c. 2.375 mi
12a. 9304 ml	12b. 53 oz	12c. 1.167 ft
13a. 2 pt	13b. 440 yd	13c. 1.125 qt
14a. 6.125 C	14b. 6 pt	14c. 4.417 ft
15a. 16 oz	15b. 28380 ft	15c. 8170 m
16a. 9000 lb	16b. 2 qt	16c. 5 pt
17a. 45 ft	17b. 6 C	17c. 622 cm
18a. 74 oz	18b. 6350 m	18c. 10 qt
19a. 76 cm	19b. 1.57 gal	19c. 5.5 T
20a. 57 oz	20b. 532 mm	20c. 3099 ml