



Changing Units (Converting Between Metric Units of Length)

Suggested time: 45 minutes

What's important in this lesson:

It is important for you to understand the difference between the various units of metric measurement. You will need to be careful when converting to make sure you are "moving the decimal" in the right direction! Use a calculator if you need to.

Complete these steps:

1. Read through the Lesson portion of the package independently.
2. Complete the required 'Practice' questions.
3. If you have questions about the examples or the 'Practice' questions seek assistance from the teacher as needed.
4. Use 'Practice' Answer Keys to check your answers as they work through the package. If you are making errors, have your teacher review these questions with you.
5. Complete the Changing Units Assignment

Hand-in the following to your teacher:

1. Practice Problems from the Student Handout
2. Changing Units Assignment

Questions for the teacher:



Changing Units

Part A - Move Over, Decimal!

The following exercises should be done with a calculator.

Practice Problems

1. Multiply:

- a. $2.632 \times 100 =$ _____
- b. $9.02764 \times 10,000 =$ _____
- c. $12.5 \times 1000 =$ _____
- d. $0.05837 \times 10 =$ _____
- e. $630 \times 100 =$ _____
- f. $93 \times 10,000 =$ _____
- g. $2.71 \times 1000 =$ _____
- h. $0.986 \times 100 =$ _____

2. For each question above,

- i. Which direction did the decimal move? _____
- ii. Compare the number of places it moved to the number of zeros in the second value. (i.e. when $\times 100$, did it move 2 places?)

3. Divide:

- a. $32,000 \div 100 =$ _____
- b. $52 \div 10 =$ _____
- c. $318 \div 1000 =$ _____
- d. $593.75 \div 10 =$ _____
- e. $23.07 \div 1000 =$ _____
- f. $1.05 \div 100 =$ _____



g. $360.42 \div 10,000 =$ _____

h. $0.095 \div 10 =$ _____

4. For each question above,
- Which direction did the decimal move? _____
 - Compare the number of places it moved to the number of zeros in the second value.

Check the answers to this page before moving on to part B!

Part B - Going DOWN! Going UP!

Review the chart of common metric lengths:

| Prefix | Example | Symbol |
|--------|------------|--------|
| kilo | kilometre | km |
| --- | metre | m |
| deci | decimetre | dm |
| centi | centimetre | cm |
| milli | millimetre | mm |

Examples

- Which of the above measurements is the LARGEST? _____
- Which of the above measurements is the SMALLEST? _____
- If you wanted to find out how many millimetres are in 13m, would you expect the answer to be SMALLER or LARGER than 13?

The answer would be much LARGER, since each mm is tiny, and it would take many of them to equal 1m.

- If you wanted to find out how many centimeters are in 26m, would you expect the answer to be SMALLER or LARGER than 26?

Once again, the answer would be LARGER, since each cm is much smaller than 1m.



TRICK – WHEN YOU NEED TO CONVERT TO A UNIT FARTHER DOWN THE CHART, THE ANSWER WILL BE LARGER THAN THE ORIGINAL NUMBER. THIS MEANS WE MULTIPLY!

To convert FROM km: $1\text{km} = 1000\text{m} = 10,000\text{dm} = 100,000\text{cm} = 1,000,000\text{mm}$

To convert FROM m: $1\text{m} = 10\text{dm} = 100\text{cm} = 1000\text{mm}$

To convert FROM dm: $1\text{dm} = 10\text{cm} = 100\text{mm}$

To convert FROM cm: $1\text{cm} = 10\text{mm}$

Examples

1. Convert 2.635m to cm –
In the second line of the chart, we see that 1m = 100cm.
So we multiply by 100
 $2.635\text{ m} \times 100 = 263.5\text{ cm}$

2. Convert 3.9km to dm –
In the first line of the chart, 1km = 10,000dm.
So we multiply by 10,000
 $3.9 \times 10,000 = 39,000\text{ dm}$

TRICK – WHEN YOU NEED TO CONVERT TO A UNIT FARTHER UP THE CHART, THE ANSWER WILL BE SMALLER THAN THE ORIGINAL NUMBER. THIS MEANS WE DIVIDE!

3. Convert 2573mm to dm-
In the third line, 1dm = 100mm.
So we divide by 100
 $2573 \div 100 = 25.73\text{dm}$

4. Convert 4.8cm to km
In the first line, 1km = 100,000cm.
So we divide by 100,000
 $4.8 \div 100,000 = 0.000048\text{km}$



Practice Problems

Fill in the blanks below using the charts provided.

| Prefix | Example | Symbol |
|--------|------------|--------|
| kilo | kilometre | km |
| --- | metre | m |
| deci | decimetre | dm |
| centi | centimetre | cm |
| milli | millimetre | mm |

To convert FROM km: $1\text{km} = 1000\text{m} = 10,000\text{dm} = 100,000\text{cm} = 1,000,000\text{mm}$

To convert FROM m: $1\text{m} = 10\text{dm} = 100\text{cm} = 1000\text{mm}$

To convert FROM dm: $1\text{dm} = 10\text{cm} = 100\text{mm}$

To convert FROM cm: $1\text{cm} = 10\text{mm}$

1. Going DOWN the chart

a) $8.27\text{m} = \underline{\hspace{2cm}}\text{mm}$

d) $683.7\text{km} = \underline{\hspace{2cm}}\text{m}$

b) $123.65\text{km} = \underline{\hspace{2cm}}\text{cm}$

e) $50.98\text{m} = \underline{\hspace{2cm}}\text{dm}$

c) $4.92\text{dm} = \underline{\hspace{2cm}}\text{cm}$

f) $4\text{km} = \underline{\hspace{2cm}}\text{mm}$

2. Going UP the chart

g) $37\text{mm} = \underline{\hspace{2cm}}\text{cm}$

j) $18.6\text{cm} = \underline{\hspace{2cm}}\text{km}$

h) $215.3\text{dm} = \underline{\hspace{2cm}}\text{m}$

k) $9.27\text{mm} = \underline{\hspace{2cm}}\text{m}$

i) $764.09\text{m} = \underline{\hspace{2cm}}\text{km}$

l) $1563\text{dm} = \underline{\hspace{2cm}}\text{km}$

3. (The following practice questions will be a mix – Some go UP and some go DOWN the chart!)

m) $17.68\text{m} = \underline{\hspace{2cm}}\text{cm}$

p) $312.5\text{cm} = \underline{\hspace{2cm}}\text{dm}$

n) $603.4\text{dm} = \underline{\hspace{2cm}}\text{mm}$

q) $7.68\text{km} = \underline{\hspace{2cm}}\text{mm}$

o) $91\text{m} = \underline{\hspace{2cm}}\text{km}$

r) $5.6\text{mm} = \underline{\hspace{2cm}}\text{m}$

Check the answers before moving on!



Changing Units Assignment

You may use any conversion charts from this unit to complete this assignment.

1. Fill in each blank.

- a. $3.6385 \times 1000 =$ _____
- b. $570.8 \div 100 =$ _____
- c. $1.97 \times 100,000 =$ _____
- d. $16.4 \div 1000 =$ _____
- e. $0.011 \times 1,000,000 =$ _____

2. Convert the following metric measurements:

- a. $6\text{cm} =$ _____ km
- b. $12\text{dm} =$ _____ mm
- c. $90\text{km} =$ _____ m
- d. $825\text{m} =$ _____ mm
- e. $1.85\text{km} =$ _____ dm
- f. $76.35\text{mm} =$ _____ cm
- g. $0.97\text{m} =$ _____ mm
- h. $5.02\text{cm} =$ _____ dm
- i. $67.38\text{dm} =$ _____ m
- j. $8,763,425\text{mm} =$ _____ km