Unit Conversion

Student Activity

Name _____

Class _____

Open the TI-Nspire document *Unit Conversion.tns.*

Measurement is a necessary skill in science. Scientists measure length, area, volume, time, velocity, mass, force, energy, power, pressure and temperature (to name a few). However, measurements have no meaning without units. What if you went to a store and told the salesperson you needed a forty length of rope. She might ask you, "Forty what?" Units of measurement, like forty <u>feet</u> or forty <u>meters</u>, provide meaning. The metric system or *International System of Units* (SI) is the most widely used system of measurement today. Scientists around the world communicate with the metric system. As part of this communication and sharing of data, sometimes measurements need to be converted from one unit to another. In this activity, you will be converting one metric unit of measurement into another using the Science Nspired Unit Conversion Tool on your TI-Nspire Handheld.
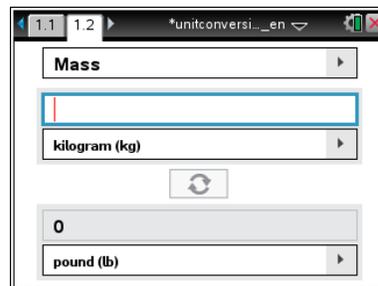
When you first open the Nspire document, you will see directions explaining how to use the simulation. Look over these and check with your classmates and teacher to discuss any items you do not understand.

NOTE: This document does not accept commas. The number will turn red to indicate the document is not working.

Move to page 1.2.

Press `ctrl` ▶ and `ctrl` ◀ to navigate through the lesson.

Example 1:

In the example, you will learn how to navigate a unit conversion by using the calculator functions.

1.   First select the measurement, **Mass**. With the first box highlighted, press ▶ or `enter`. Highlight Mass and press `enter`.
2.   Press `tab` to move to the next box. Enter the number **10**.
3.   Move to the next box to select the unit of measure to convert from. From the drop-down menu, select **kilogram (kg)**.
4.   Move to the last box to select the unit of measure to convert to. From the drop-down menu, select **pound (lb).**
5.   The converted value will be visible in the box. Check to be sure it shows 22.046226 pounds (lb).
6.   To shift to converting pounds to kilograms, click the reversal button.

Fill in the answer below on this activity sheet according to the measurement units on your handheld:

Now, use the unit conversion tool to answer the questions 1-11 here on the activity sheet. Make sure to write the correct units for each measurement. Measurements mean nothing without units!

Q1. A red photon with a wavelength of 621 nm has 2 electron volts (eV) of energy. What is this amount of energy in joules (J)?
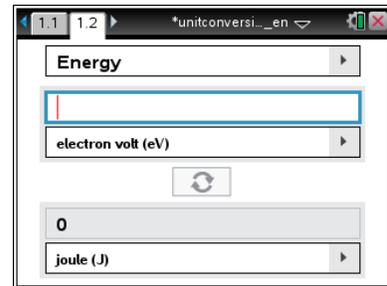
NOTE: Remember that this document supports scientific notation.

Q2. Food energy is often expressed in calories. How many calories (cal) are there in 1 joule (J)?

Q3. A meteorologist reports that atmospheric pressure is 106 kilopascals (kPa).

    A. What is the pressure in atmospheres (atm)?

    B. What is the pressure in millimeters of mercury (mmHg)?

Q4. Scientists discovered a humpback whale weighing 30,000 kilograms (kg) washed ashore.

    A. How many pounds (lb) does this whale weigh?

    B. How many tons does this whale weigh?

Q5. An ichthyologist needs to measure a rainbow trout and then compare the standard length of 19.5 inches (in), to the fish's total length of 24 inches (in).

    A. What is the length difference in centimeters (cm)?

    B. What is the fish's total length in millimeters (mm)?

Q6. A chemist is mixing a solution of 300 milliliters (ml) of saltwater to 2 liters (l) of freshwater:

A. What is the final volume of the solution in milliliters (ml)?

B. What is the final volume of the solution in gallons (gal)?

Q7. A businessperson is looking at purchasing two adjacent pieces of property, the first one is 108 hectares (ha) and the second is 26 acres.

A. How many acres is the first piece of property?

B. How many hectares (ha) is the second piece of property?

C. Find the total area of the two pieces of property in square miles (m^2).

Q8. A high school runner completes a 400-meter race in 1.12 minutes (min).

A. How many seconds (s) was this race completed in?

B. If the runner maintained this pace for another 400 meters, what would the final time be in seconds (s)?

Q9. A long distance runner has a pace of 6.4 miles per hour (mi/hr).

A. How many feet per minute (ft/min) does he travel?

B. What is his pace in kilometers per hour (km/hr)?

Q10. The temperature of the sun is approximately 5,770 Kelvin (K) degrees.

A. What is this temperature in degrees Fahrenheit (°F)?

B. What is this temperature in degrees Celsius (°C)?

Q11. A homeowner has a 350-kilowatt (kW) portable generator.

A. What is the horsepower (hp) of this generator?

B. How many watts (W) are there in a 500 horsepower (hp) generator?

Extension – Student Inquiry

According to your teacher's directions, choose an object in the room. Take a measurement of the object.

- Record the name of your object here:

- Draw a sketch of your object here:

In the blanks below, identify the measurement you will take, the instrument you will use to take the measurement, the units you will use, and the units you will convert to. Then, take your measurement and use the calculator tool to do a unit conversion.

- I will measure the object's _____.

- I will measure the object with a _____.

- I will use the following units: _____.

- I will convert to the following units: _____.