Content Area: Mathematics, Physics

Aims: to identify and compare the Imperial and US customary units and Metric system of measurement
to familiarize students with some terminology connected with Mathematics and Physics
to practice converting between different units of measurement

Assumed knowledge: Students know different metric units and their equivalents
Students are able to identify and convert between different units of measurement

Anticipated problems: The difficulties of working with customary units can absorb significant class time because customary units require complex multiplication and division
Students may have problems with remembering and using the new vocabulary

Teaching aids: Measuring units handouts
Worksheets for conversion of various measuring units (both customary and metric units)
A set of exercises
A quiz

New vocabulary:
Measurement units (mile, foot, inch, yard, ounce, cup, pint, quart and gallon)
Mathematics vocabulary (equal, multiply, multiplied by, divide, divided by, convert sth to sth)
Reading fractions (1/2 one-half, 1/3 one-third, ¼ one-fourth or a quarter, ¾ three-fourths, etc.)

Sources:
www.mathsisfun.com
www.cpalms.org
www.skillsyouneed.com
https://en.wikipedia.org
http://teachers.net/lessons

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Topic: Measurement Units

What do you know about the International System of Units?
Systems of measurement in modern use include **the metric system, the imperial system, and United States customary units**. The current international standard metric system is the International System of Units (Système international d'unités or **SI**). It is a system based on the **metre, kilogram and second** as well as the **kelvin, ampere, candela, and mole**. Both imperial units and US customary units derive from earlier English units. They are still used for some applications in the United Kingdom but have been mostly replaced by the metric system in commercial, scientific, and industrial applications. US customary units, however, are still the main system of measurement in the United States. Lengths and distances are measured in **inches, feet, yards and miles**. Fluids are measured in **fluid ounces, cups, pints, quarts and gallons**.
In general, you will probably survive with detailed knowledge of only one system of weights and measures. However, it can be helpful to know roughly how to convert between different systems of measurement when you're travelling, doing business abroad or even just for interest.

Have some fun doing the following exercises

Small units of length are called **inches**.

The last joint of your finger or thumb is about **1 inch** (depending on how big your fingers are!).
An inch is defined as exactly **2,54 centimeters.**

When we have **12 inches** together, it is known as a **foot**.
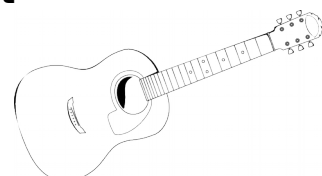
1 foot = _____ inches

A long time ago, people used their feet to measure things. But everyone has different sized feet so it did not work very well.

When **3 feet** are together, it is called a **yard**. (This isn't the same thing as a garden, though they are both referred to as a "yard"!) ☺

1 yard = _____ feet

The length of this guitar is about **1 yard.**

When we put together **1 760 yards**, we have a **mile**. → **1 mile = 1 760 yards = _____ feet**

Miles are long distances and are mostly used to measure the distance between places which are far away from each other. Most people refer to miles when they are driving, biking or jogging.

1 foot = _____ inches   1 yard = 3 feet = _____ inches   1 mile = 1 760 yards = _____ feet = _____ inches

Some useful tips for the next exercises

1 kilometre = 0.621 miles   1 mile = 1.609 kilometres   1 meter = 0.000621 miles   1 mile = 1609.34 meters   1 foot = 0.000305 kilometres   1 kilometre = 3280.84 feet   1 centimetre = 0.394 inches   1 inch = 2.54 centimetre   1 centimetre = 0.0328 feet   1 foot = 30.48 centimetre   1 meter = 3.281 feet   1 foot = 0.3048 meters   1 meter = 1.094 yards   1 yard = 0.914 meters

What is longer: a mile or a kilometre?

A mile is exactly **1,609344 kilometres. A mile** is equal to **1,609 kilometres**. To convert miles to kilometres, simply **multiply** the number of miles **by 1,609.** To convert kilometres to miles, **multiply** the number of kilometres **by 0,6214** or **divide by 1,609.**
                The answer is: A mile is _____ than a kilometre.

Exercise 1
Mary was driving her car with a speed of 60 mph and she was overtaken by a car which was going 120 km/h.
What was Mary's speed in kilometres per hours and the speed of the other car in miles per hour?

Exercise 2
Which of these units is the biggest?   **A** Foot   **B** Inch   **C** Mile
        D Yard

Exercise 3
One metre is…   **A** the same as 2 feet   **B** less than a yard   **C** the same as a yard **D** more than a yard

Exercise 4
An inch is less than a centimetre.   **A** True   **B** False

Exercise 5

a How many kilometres are in 8 miles?   _____
b How many miles are in 8 kilometres?   _____

c How many feet are in 4 kilometres? _____

d How many meters are in 9 miles? _____

e How many yards are in 10 meters? _____

f How many centimetres are in 8 inches? _____

Exercise 6

X: What's your height?   **A** 183 centimetres   **B** 1,73 metres **C** 175 centimetres
          D 1,91 metres

Y: I'm 5 feet, 8 inches tall.

X: So, you are ... in height.

Exercise 7

What is your height in centimetres, metres and feet and inches?

I am _____ centimetres tall.

My height is _____ metres and _____ centimetres.

I am _____ feet, _____ inches in height.

Tip: *If a man is 203 centimetres tall, his height is 6 feet 8 inches:*
203 cm x 0.394 inches = 79, 982 inches   79, 982 inches : 12 = 6,66 > **6 feet**   *0,66 x 12 = 7,92 >* **8 inches**