

MATH 191 FUNDAMENTALS OF MATHEMATICS II
SECTION 11.1: FUNDAMENTALS OF MEASUREMENT
JANUARY 31, 2014

Measurement

When measuring things, we have to *choose* an _____ to look at. Examples include:

Measuring means _____ to a fixed _____,
called an _____. The principle of *additivity* says that, for example,

Systems of Measurement

Historically, units of measurement were defined by things like

Now we define units of measurement using

Around the time of the French Revolution, during the Age of Enlightenment, there was a movement to standardize the units of measurement, leading to the *metric system*. The metric system is based on our base 10 system and has a uniform way of naming units using prefixes.

nano-

micro-

milli-

centi-

deci-

deka-

hecto-

kilo-

mega-

giga-

	US (Imperial) System	Metric System
Units of Length		
Units of Area		
Units of Volume		
Units of Weight		
Units of Temperature		

How to Measure Length

We can measure length by lining up objects of the same length (for example, 1 inch paperclips) and counting how many it takes to get to the desired length. Challenges include:

We often measure length with a ruler. Challenges for children include:

What Measurements Mean and Common Misconceptions

What does it mean for a rug to have area 80 square feet?

What does it mean to have 100 grams of sugar?

Which of the following have the same meaning/volume? Which are different?

- 2 cubic inches
- A cube with all sides of length 2 inches
- 2 in.^3
- $2 \text{ in.} \times 2 \text{ in.} \times 2 \text{ in.}$

Why might we choose to say “2 cubic inches” instead of “2 inches cubed” for 2 in.^3 ?

What is wrong with saying that area is length times width?