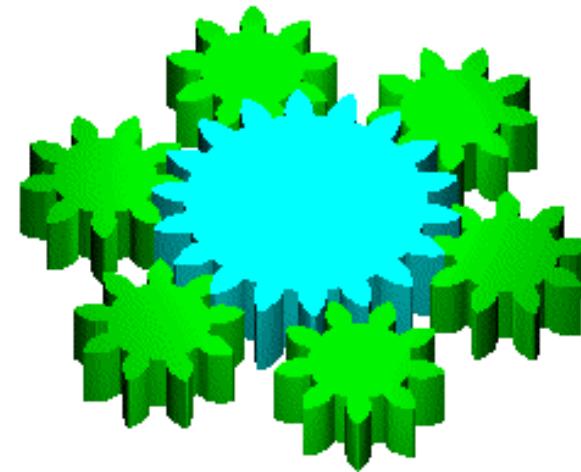
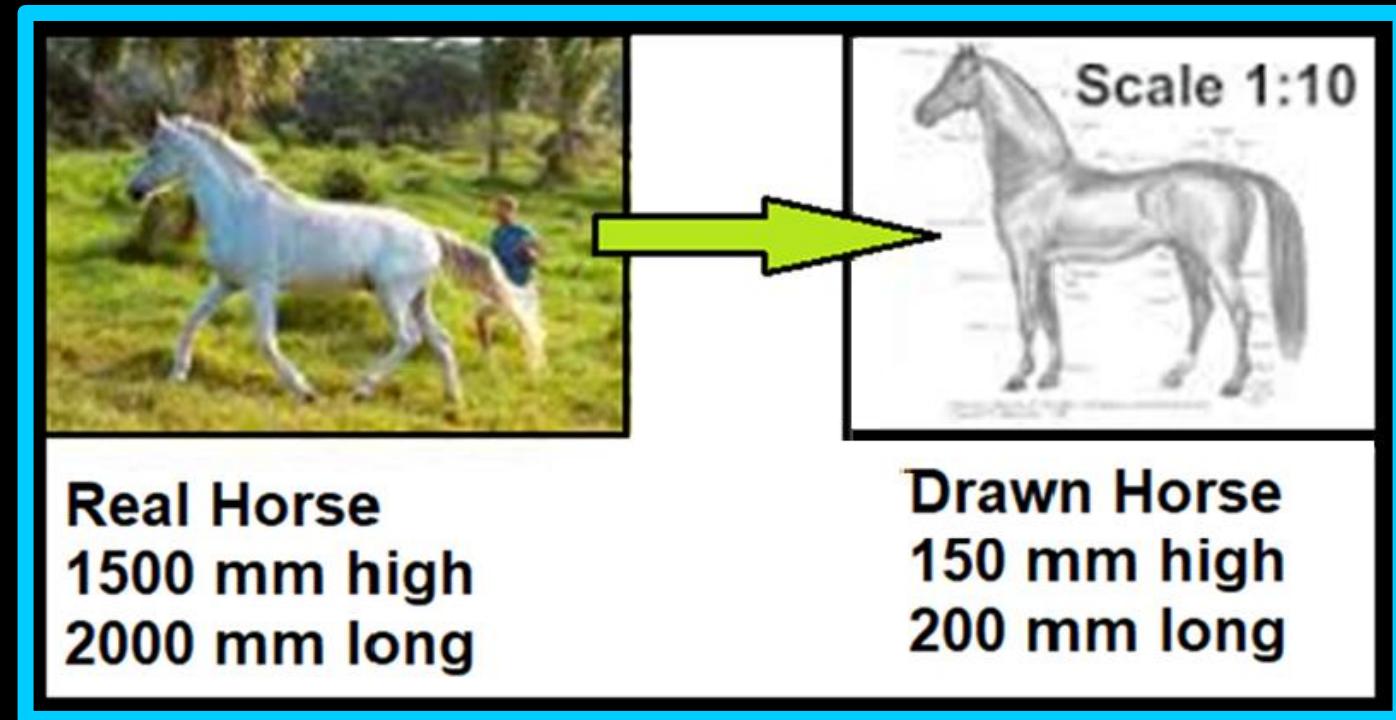


# Scales and Scales

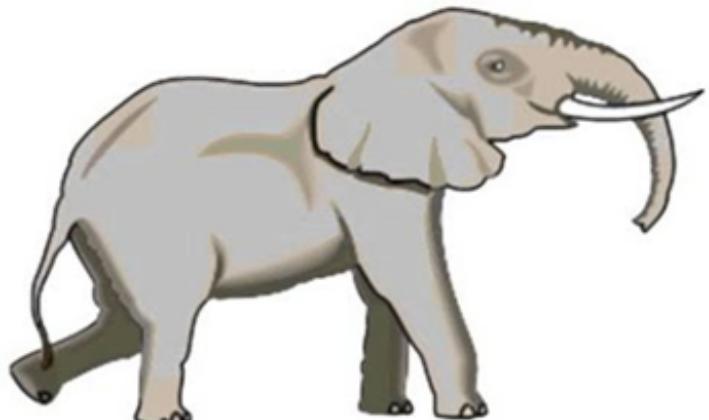


# WHAT IS THE SCALE OF A DRAWING?



- Often, it is impractical to create true-to-size drawings. Usually they must be reduced to a manageable size, i.e. the drawing must be **scaled**.
- The **scale** of the drawing is the mathematical indication of how much the real size has been scaled down. Sometimes, it is necessary to scale up.
- 1:10 means that one unit on the drawing represents 10 units on the horse.

Maria made a scale drawing of an elephant.  
What is the actual length of the elephant?



length

Scale
$\frac{1}{4}$ in = 2 feet

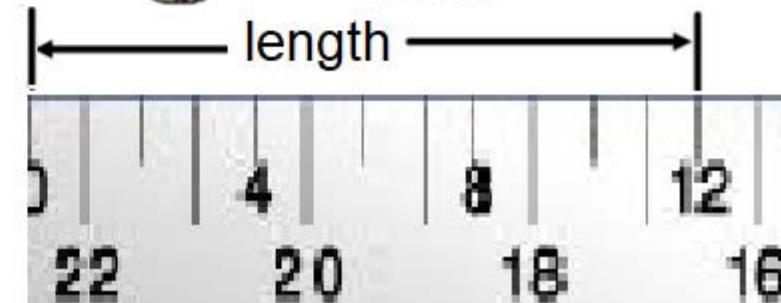
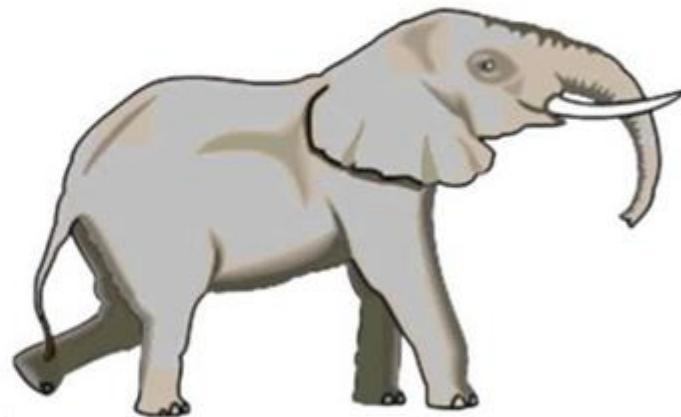
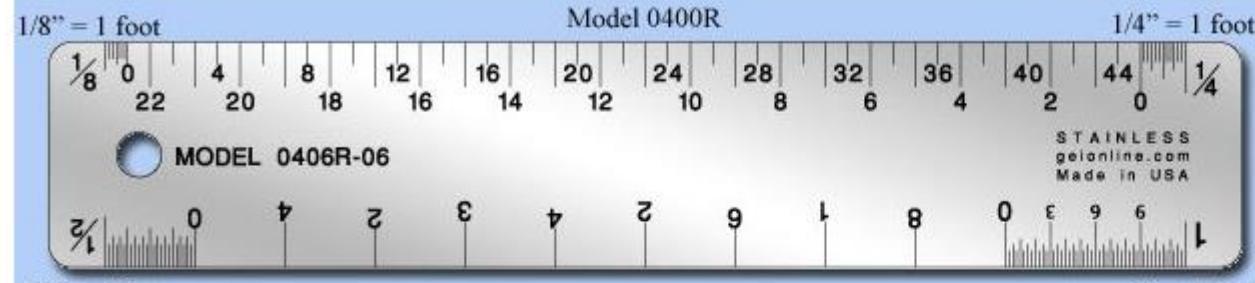
1. Measure the line with a ruler.
2. Set up a proportion and solve.

If the length measured on the drawing  
is 1.5 in, then the elephant is actually

$$1.5 \text{ in} \times (2 \text{ feet} / 0.25\text{in}) = 12 \text{ feet}$$

# ALTERNATIVELY:

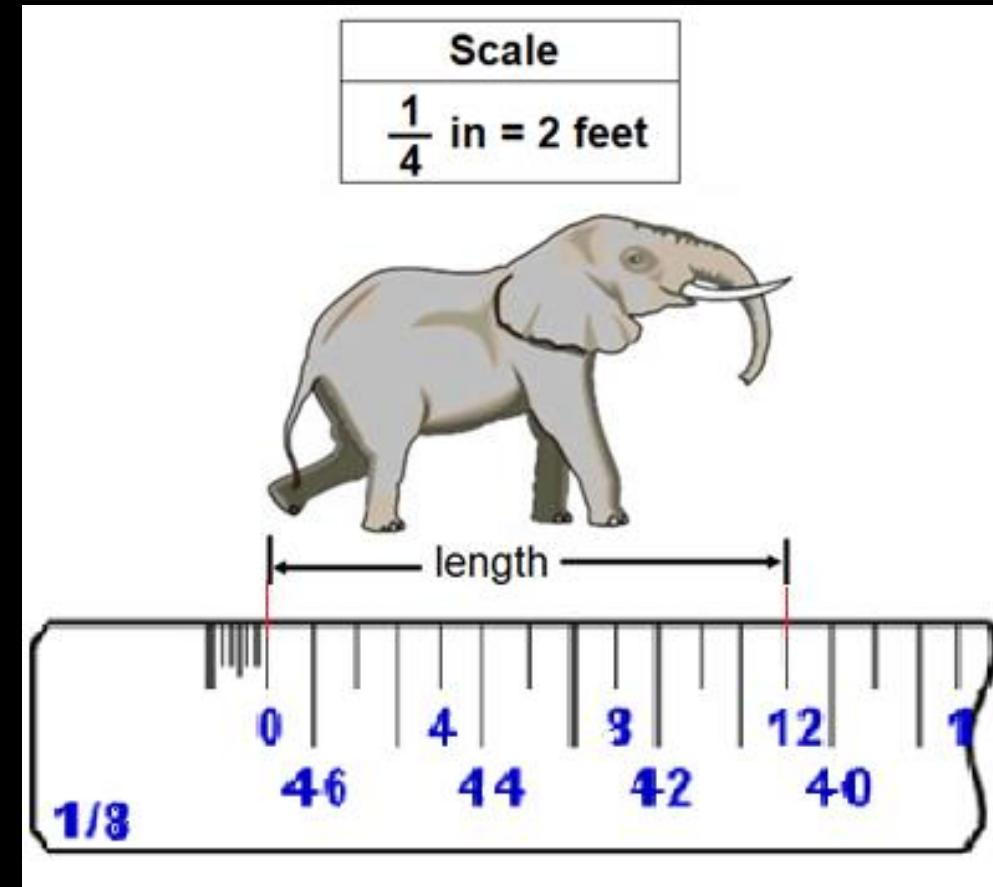
Measure the length directly with the appropriate **scale!**

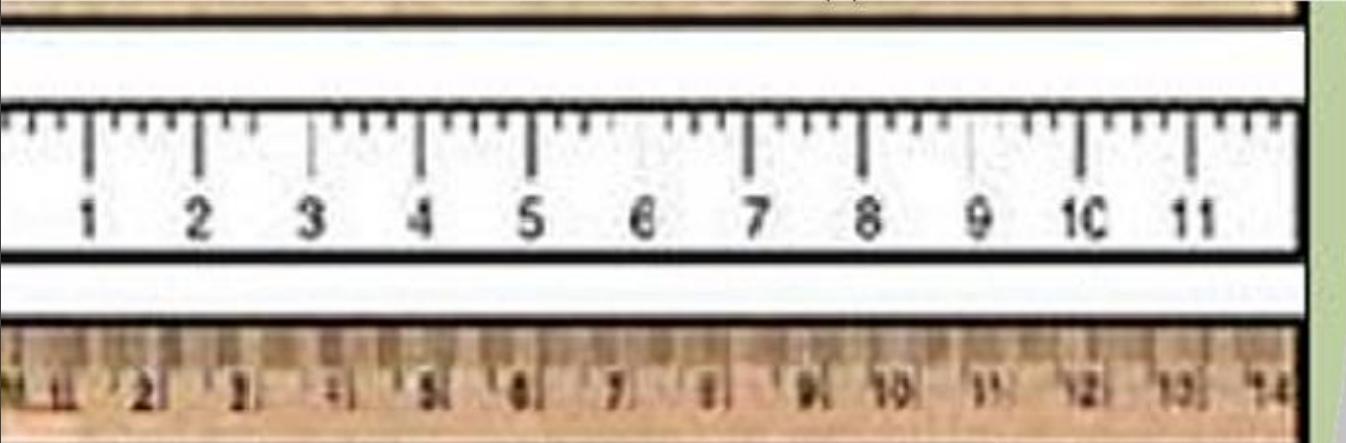


# MEASURE THE LENGTH DIRECTLY WITH THE APPROPRIATE **SCALE** ? ? ?

We just saw that **scale** refers to the size reduction (or enlargement) of a drawing

**Scale** *also* refers to a tool used to measure a scaled drawing. It gives a quick method for getting the actual size.





Reading

A

Ruler



Is  
Easy

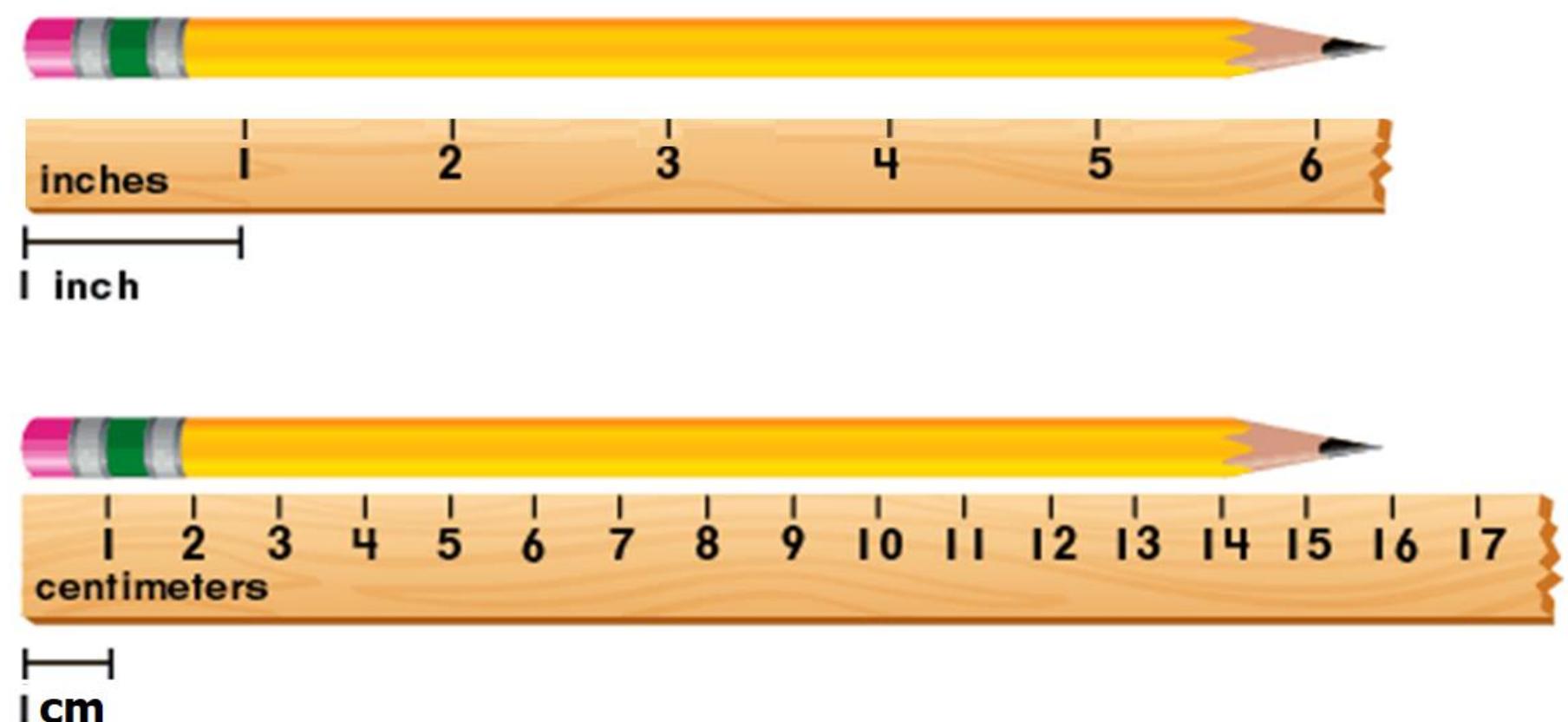
# Reading Scales

NOT SO  
MUCH!

# A ruler is different than a scale.

A ruler is a flat, rectangular tool that measures distances.

The graduations are in units of their actual size.



A **Scale** is also a tool  
that measures  
distance.

Its graduations are in  
units that are “scaled.”



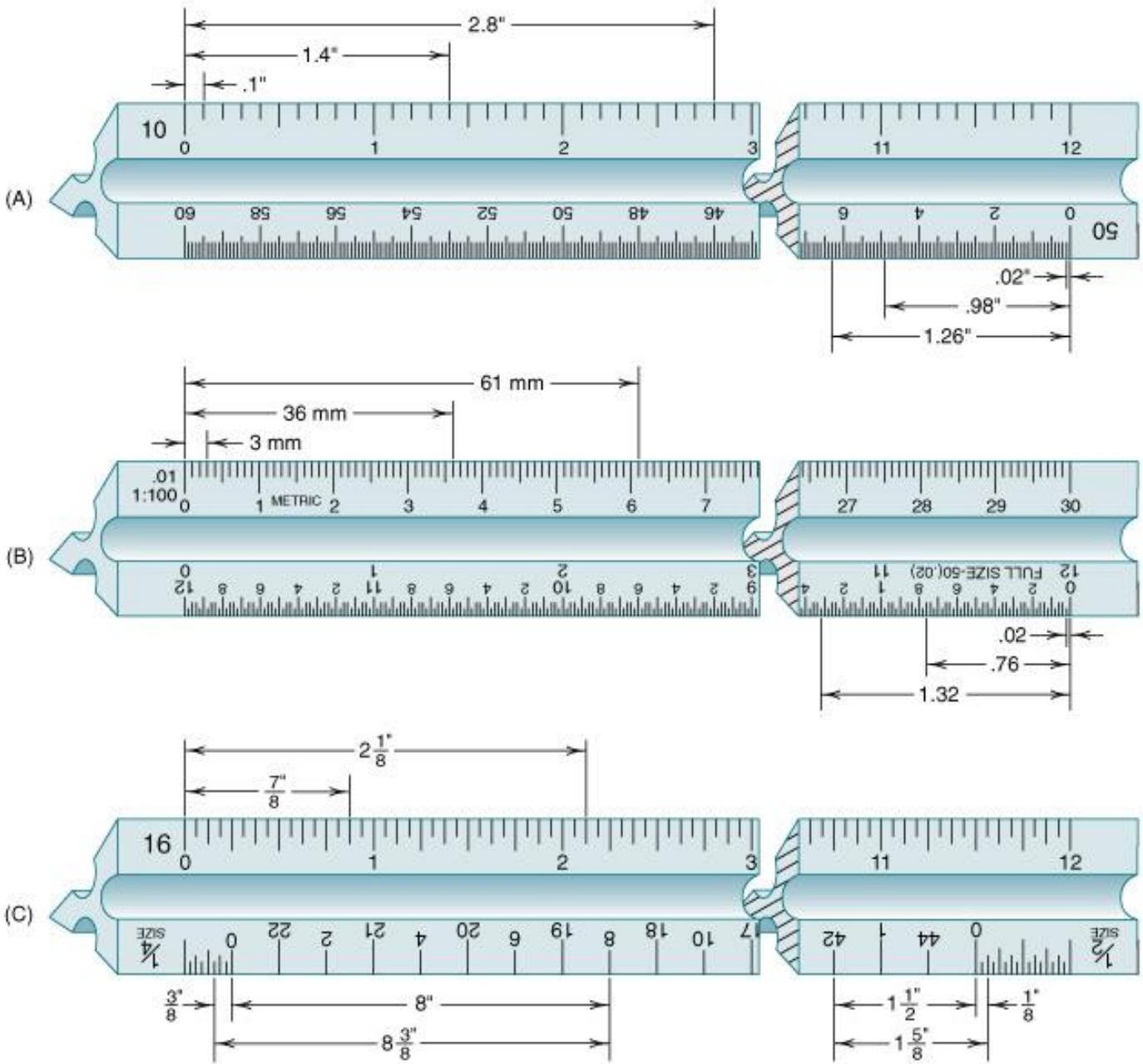
There are different scales  
for different technical fields

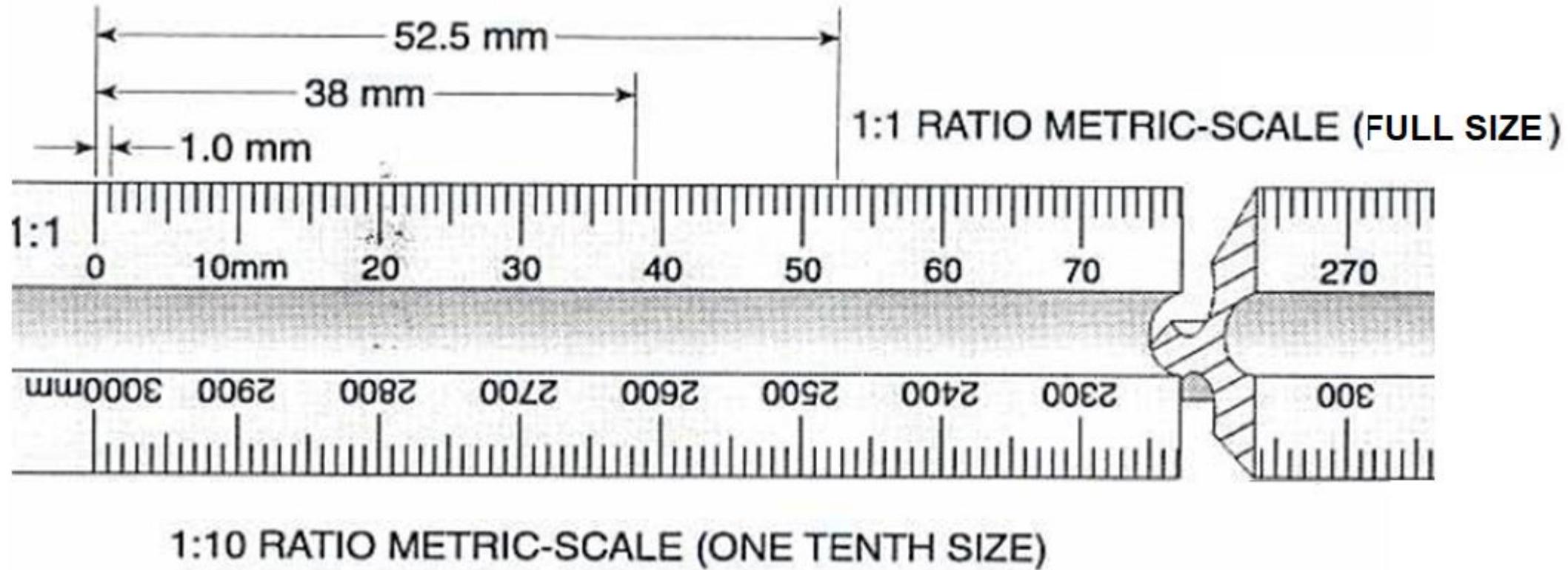
- Engineering
- Civil
- Architect



# An Engineer's Scale can be in:

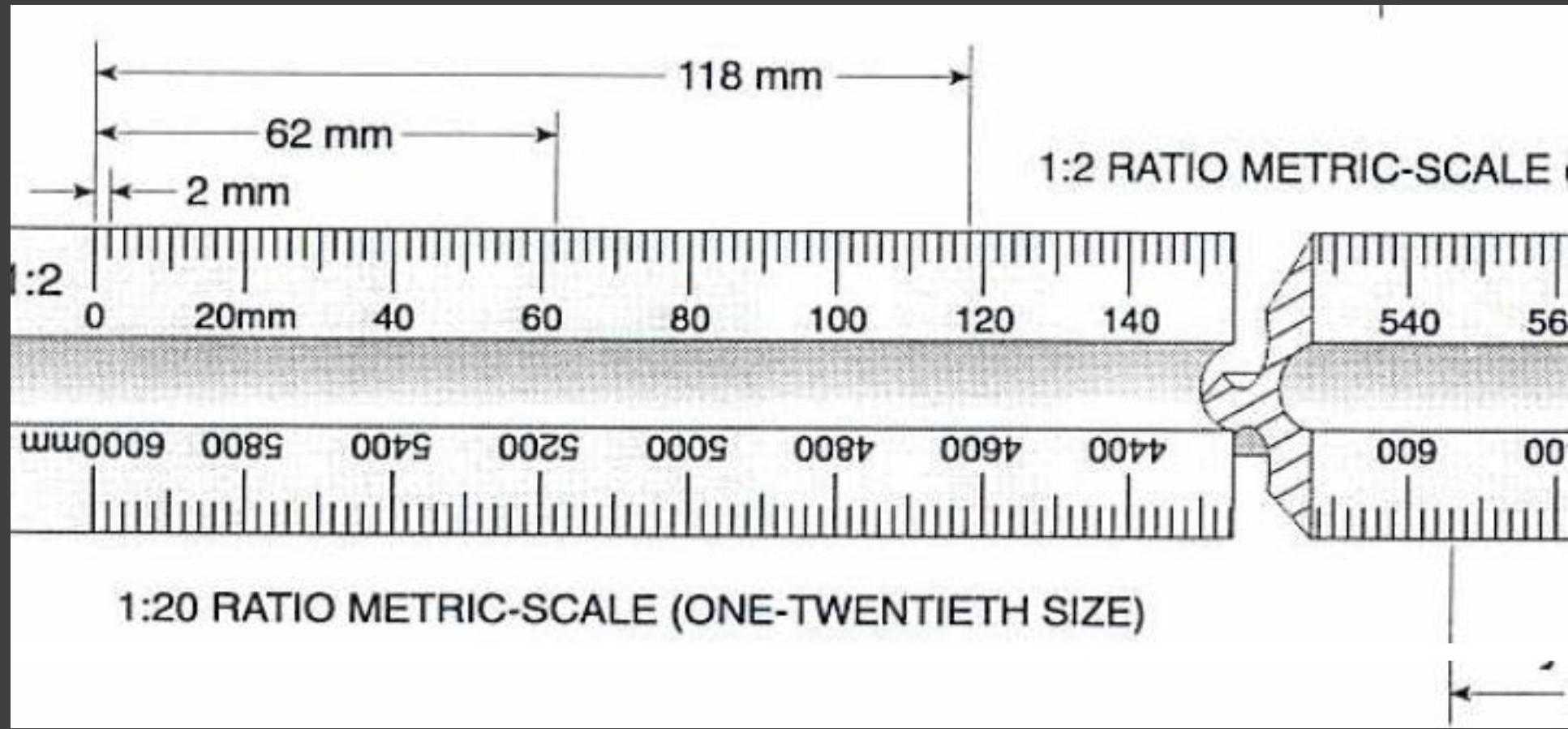
- A. decimal inches
- B. mm (metric)
- C. fractional inches





# Engineering Scale – Metric

The top scale is full size (1:1) and the bottom one is one tenth (1:10)

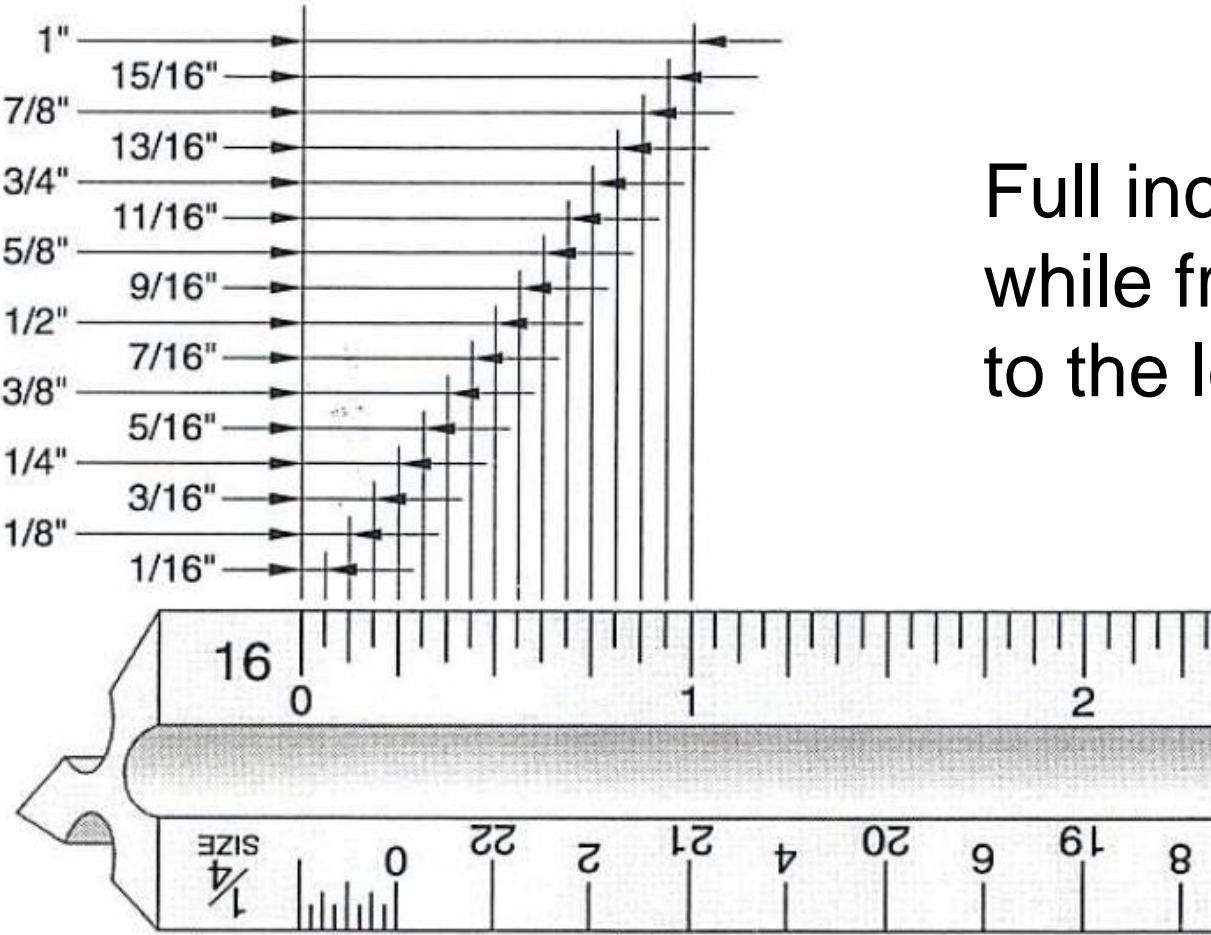


# Engineering Scale – Metric

The top scale is ONE-HALF Size (1:2)

The bottom scale is ONE-TWENTIETH SIZE (1:20))

# Engineering Scale – English



Full inches are measured to the right while fractions of an inch are measured to the left.

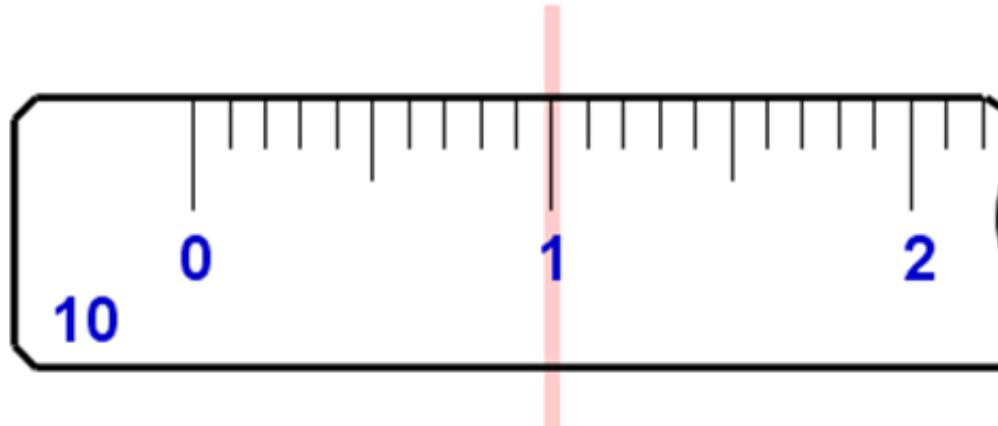
# Civil Engineer's Scale

Based on a multiples of ten

<i>Scale</i>	<i>Ratio</i>
$1'' = 10'$	$1 : 120$
$1'' = 20'$	$1 : 240$
$1'' = 30'$	$1 : 300$
$1'' = 40'$	$1 : 400$
$1'' = 50'$	$1 : 500$
$1'' = 60'$	$1 : 600$
$1'' = 100'$	$1 : 1200$
$1'' = 200'$	$1 : 2400$

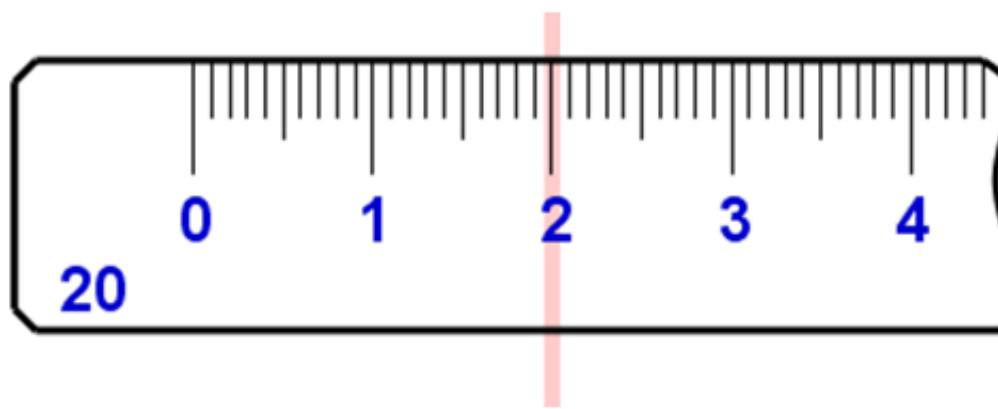
# Civil Engineer's Scale

Used for measuring roads, water mains, and topographical features.



$$1'' = 10'$$

Can also be shown as 1:10 means that 1 inch on the scale represents 10 feet of the actual object.



$$1'' = 50'$$

Can also be shown as 1:50 means that 1 inch on the scale represents 50 feet of the actual object.

# Architect's Scale

Used to measure interior and exterior dimensions in structures and buildings, such as rooms, walls, doors, etc.

Some Typically Architect Scales:

- $1/4'' = 1'-0''$  (1/48 size)

Means that  $1/4''$  on the scale represents  $1'0''$  on the object.

- $1/8'' = 1'-0''$  (1/96 size)

Means that  $1/8''$  on the scale represents  $1'0''$  on the object

