

Topographic Maps

Take Notes as you view the slides

Lesson Objectives

- Define a topographic map and state its uses.
- Describe how contour lines show the elevations, shape, and slope of the land.
- Identify the 3 types of scale and how it is represented on a map.
- Identify the meanings of some symbols and colors used on topographic maps.

Key Words

Topographic Map

Contour Interval

Bench Mark

Contour Lines

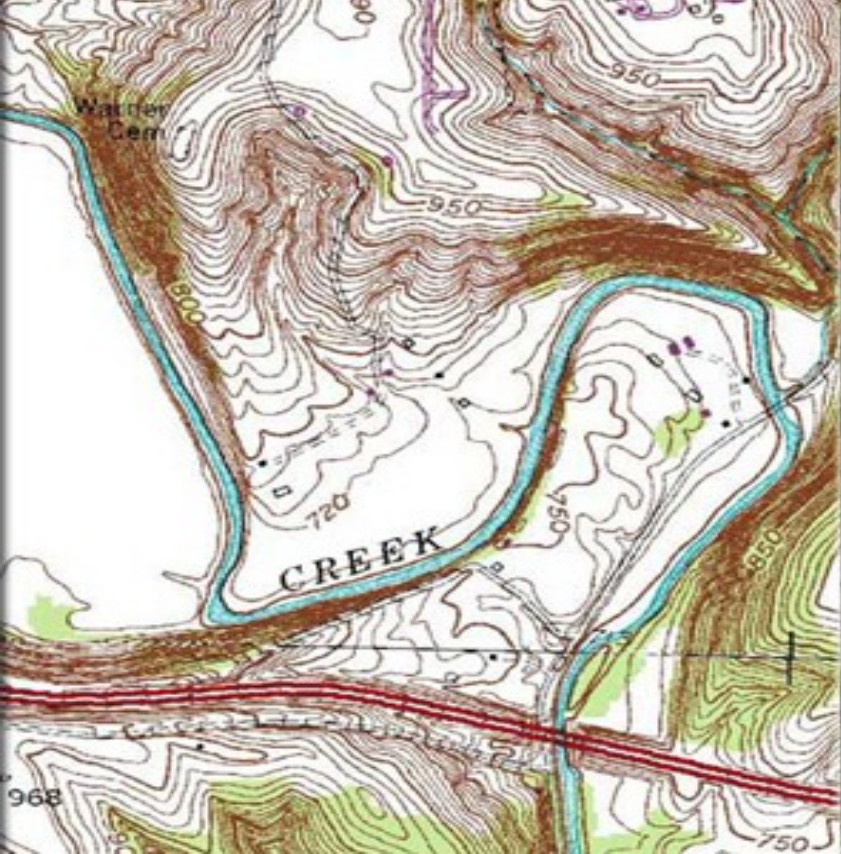
Index Contours

Map Scale

What is a topographic map?

Topographic Maps are representations of the real world, complete with hills and valleys, all presented on a flat surface (i.e. paper).

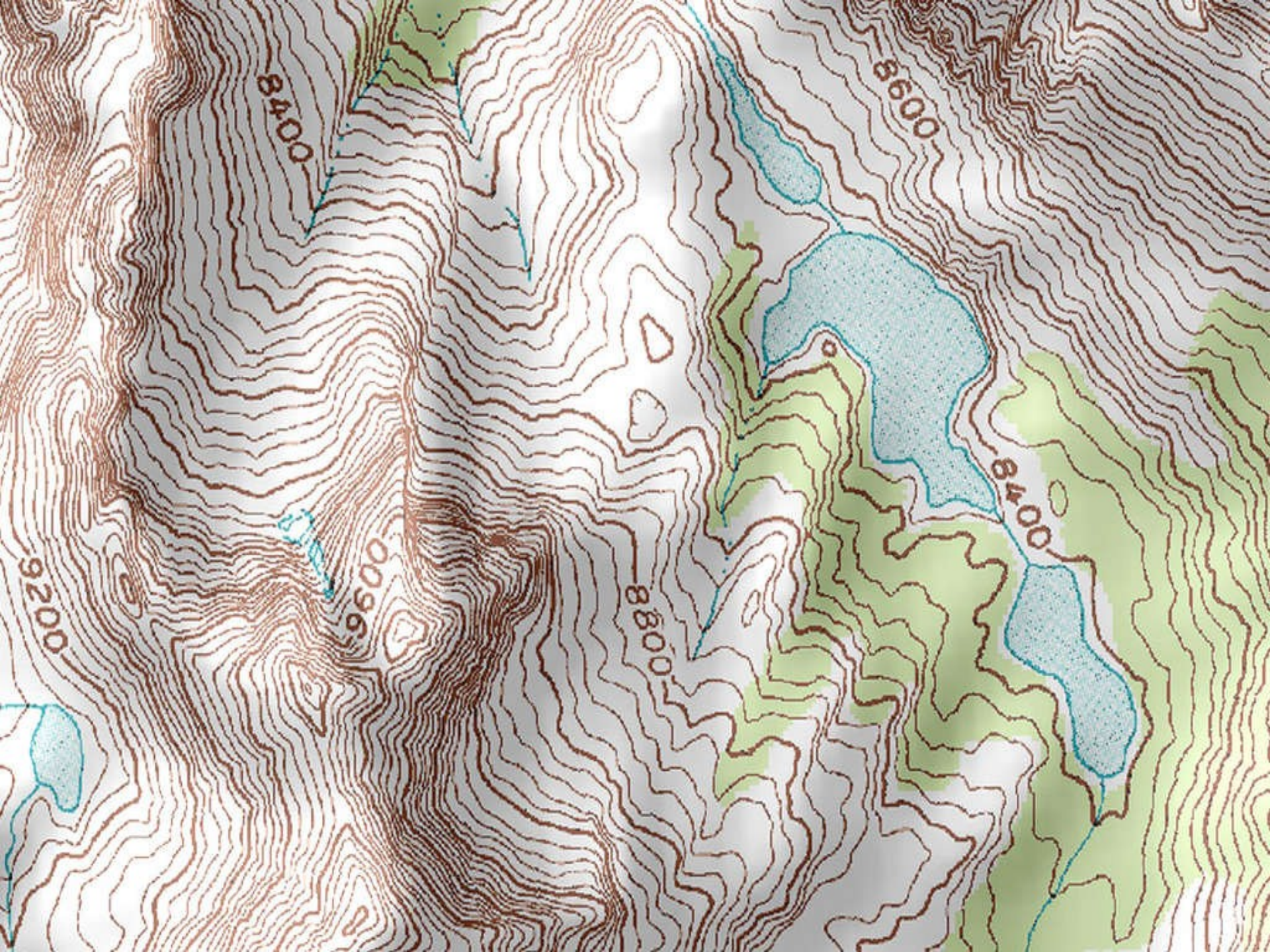
The next slide is a topographic map of Owingsville along with an aerial image of the town:



What is a topographic map?

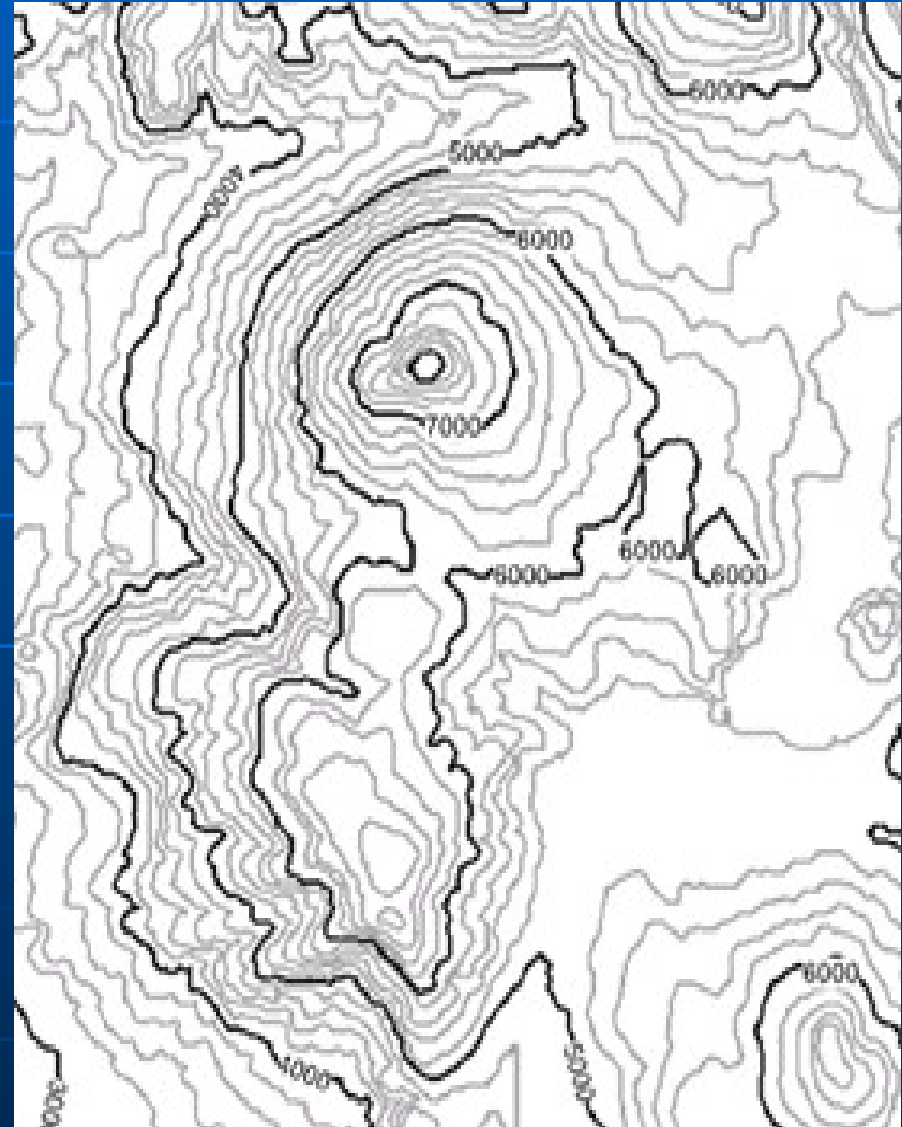
The most important feature of a topography map (aka "topo maps") is that it shows the elevation (or height) of the land using contour lines.

- Essentially, it is a map that shows how high and low the ground is in relation to sea level.



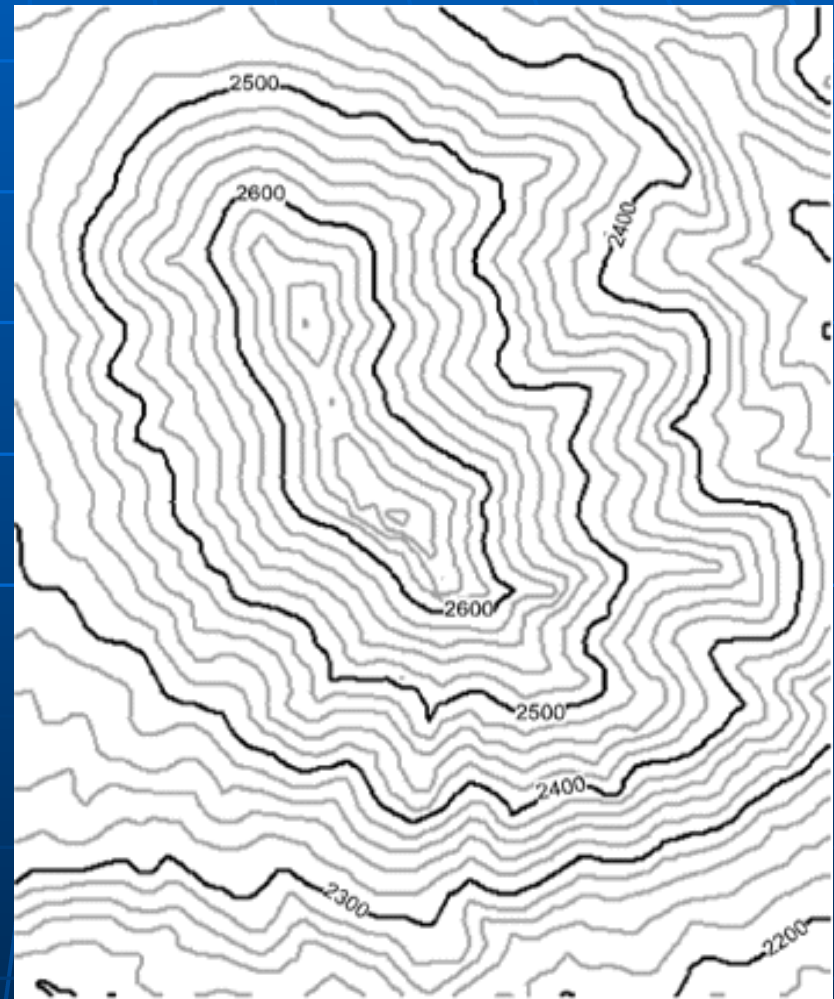
What are contour lines?

- Contour lines are lines that connect points that are of the same elevation.
- They show the exact elevation, the shape of the land, and the steepness of the land's slope.
- Contour lines never touch or cross –
always a rough circle



What is a contour interval?

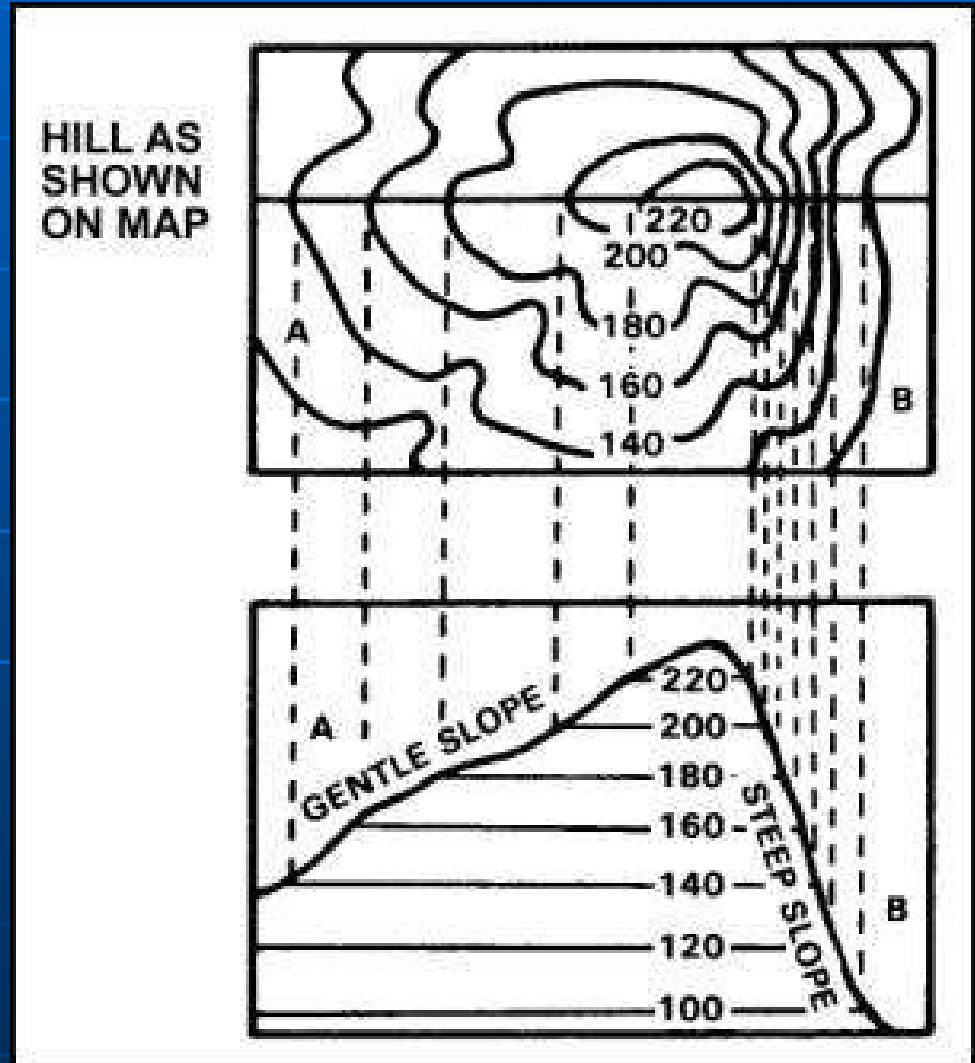
- A contour interval is the difference in elevation between two contour lines that are side by side.
- **Remember** that a contour interval is not the distance between the two lines – to get the distance you need to use the map scale.

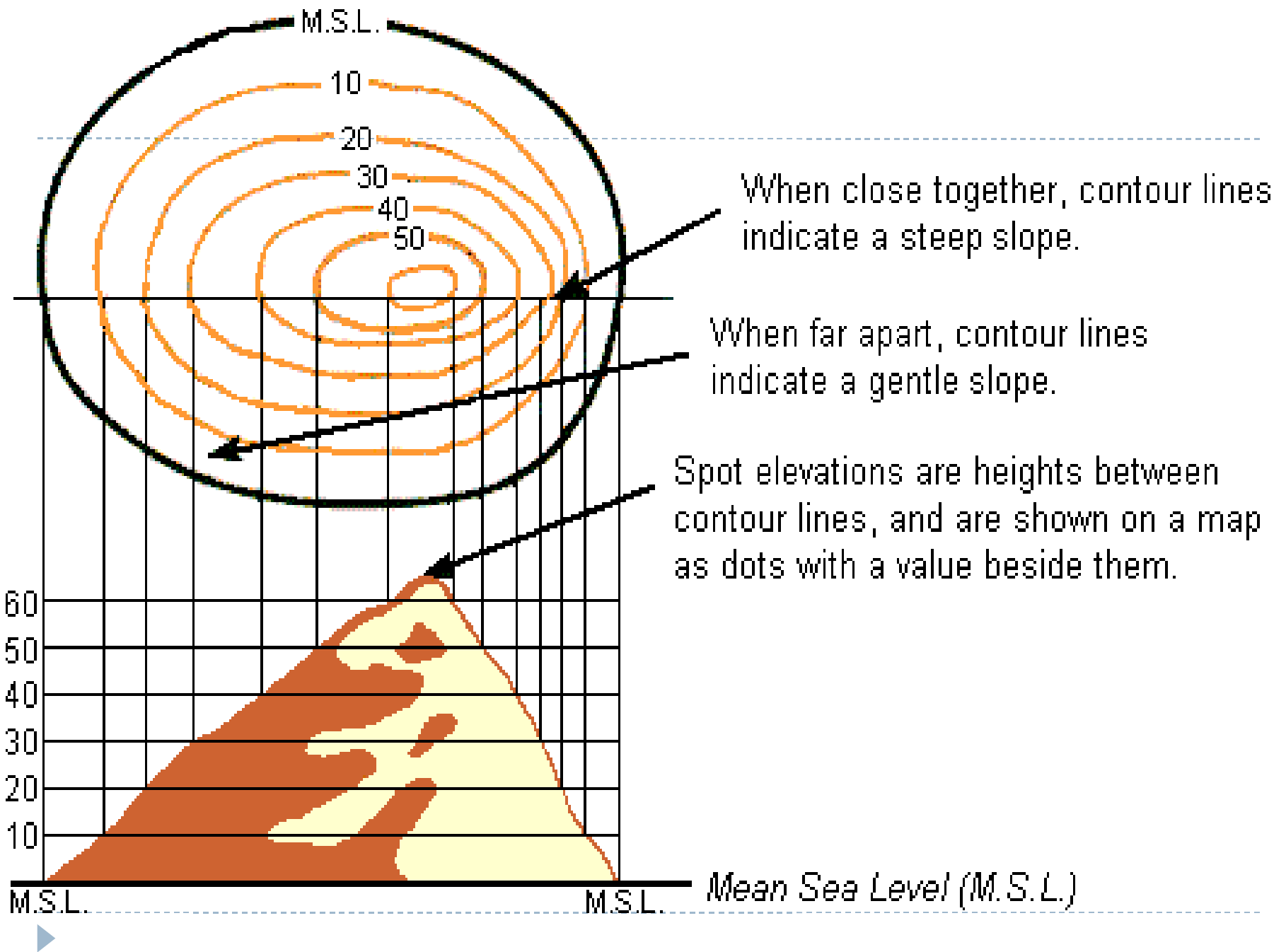


Reading a topographic map- Slope

Closely spaced contour lines represent steep slopes.

Widely spaced contour lines represent gentle slopes.

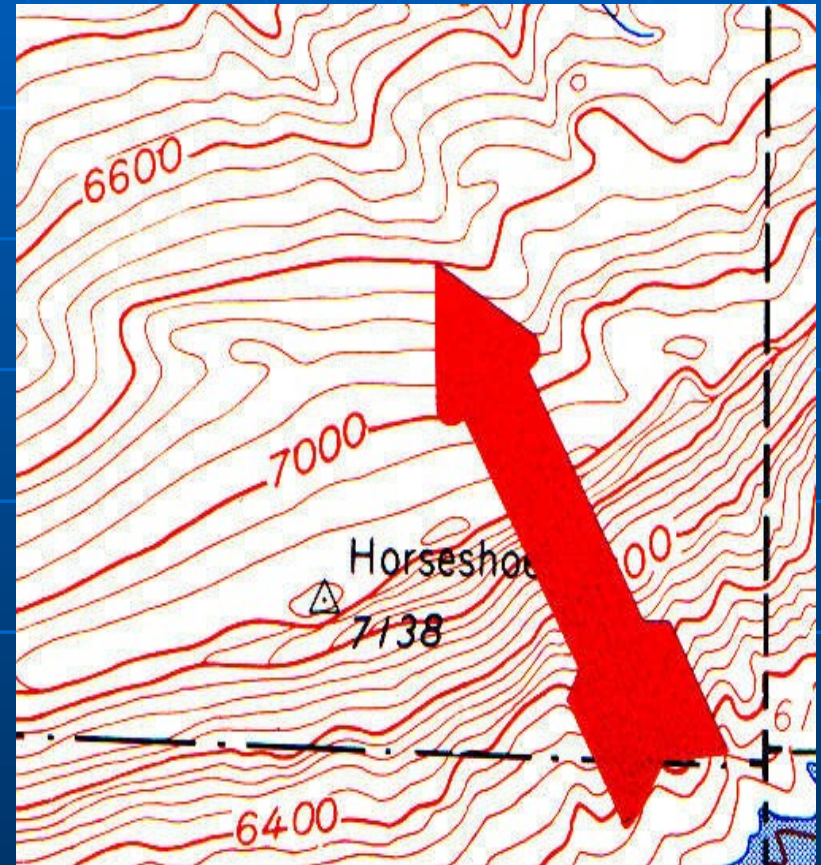




Index Contours

Index Contours are the **bold** contour lines which are labeled with an elevation.

Index contours occur every fifth contour line

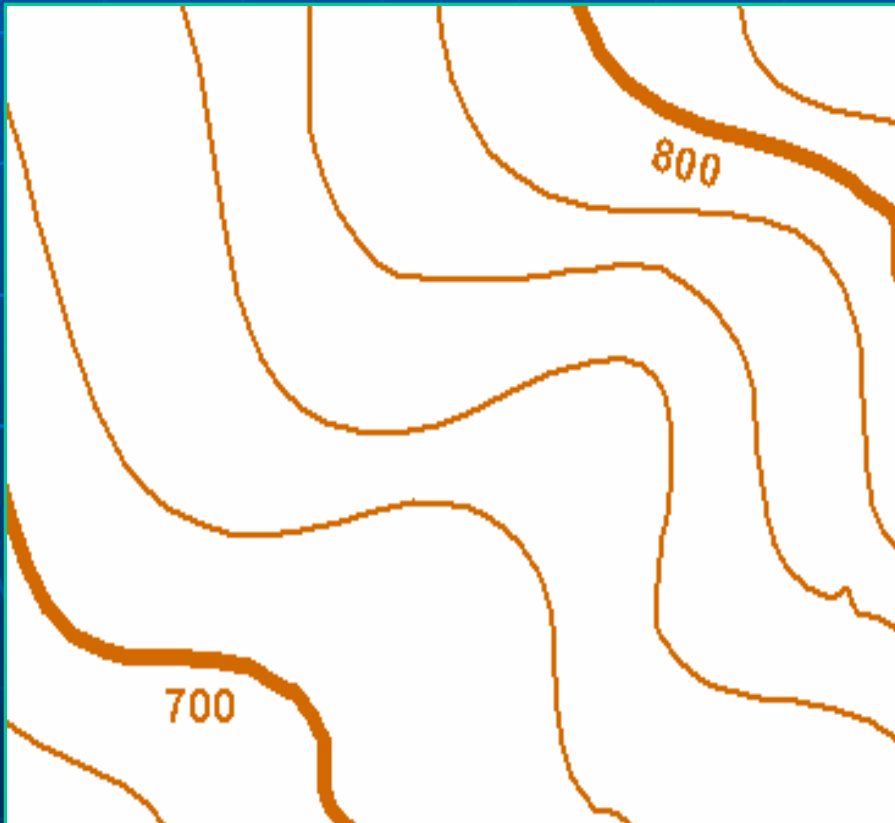


Red arrow indicate location of index contours.

Index Contours

Question:

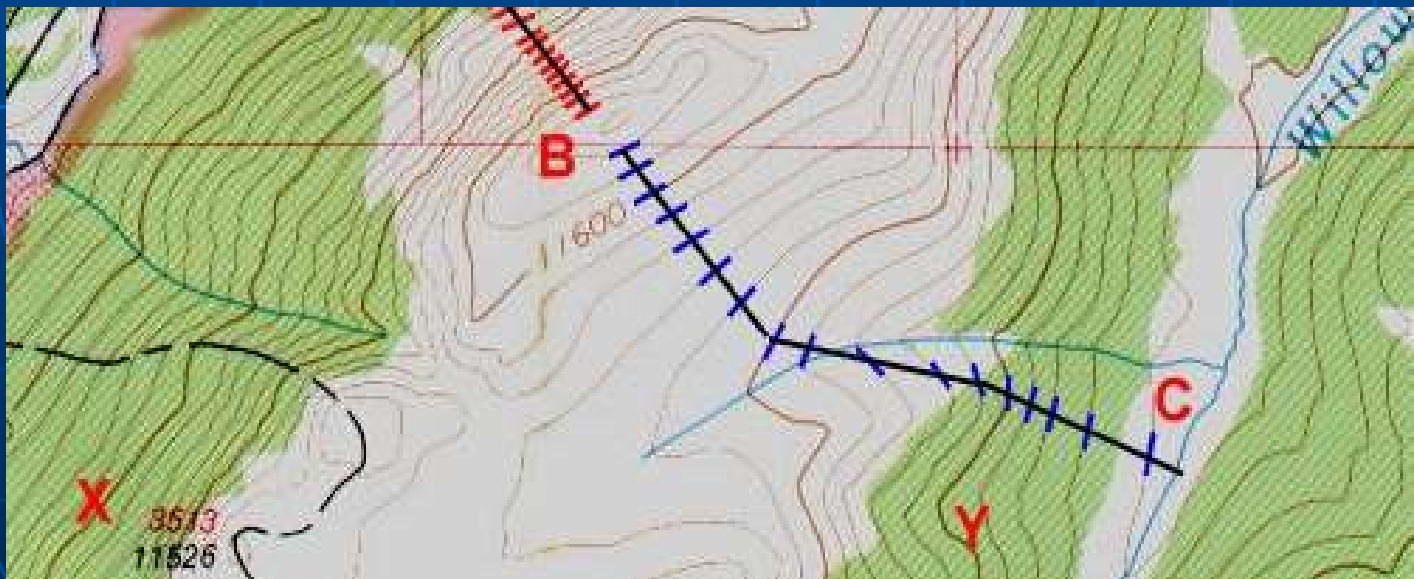
What is the contour interval of the map below?



Answer:
20 meters

More on Contour Lines

- Contour lines form V's that point upstream when they cross a stream.
- It is important to remember that they point in the opposite direction as the flow of water.



What is a benchmark?

A benchmark is a place where exact elevation is known. It is useful in determining contour lines.

Shown by a B.M. on map

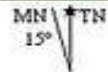
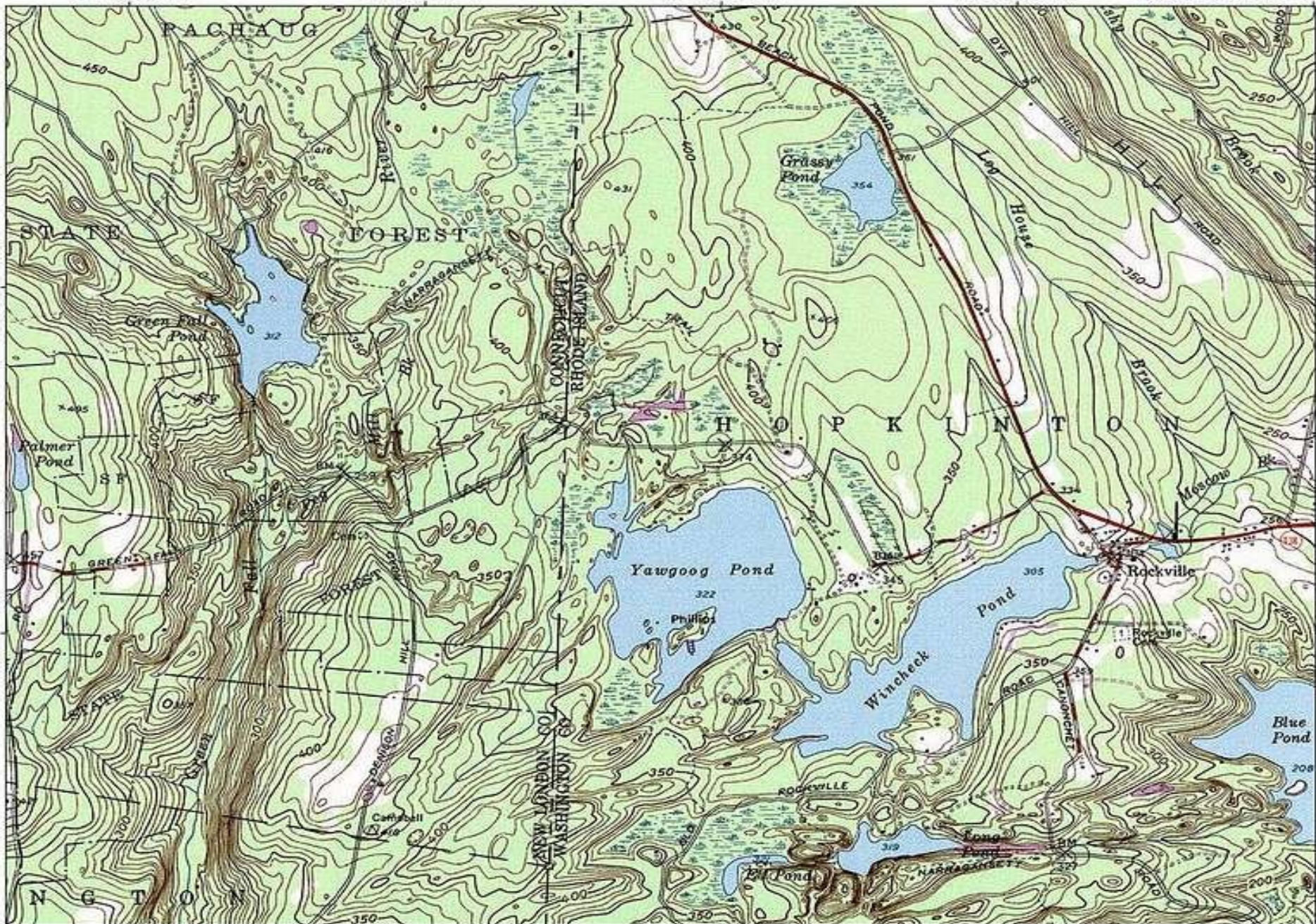
Ex: BM 60



Map Colours

Topo Maps use five basic colors to indicate various features: **green**, white, **blue**, black, and **brown**.

- **Green** indicates heavy vegetation – areas covered by forests, woods, jungles, etc.
- **White** indicates areas that are mostly clear of trees – fields, plains, sand flats, etc.
- **Blue** indicates bodies of water – lakes, rivers, streams, swamps.
- **Black** indicates human-made features, including roads, trails, buildings, bridges, railroads, airports, etc. (**NOTE:** Principle roads are often shown in red or red and white also.)
- **Brown** is used for contour lines



Now that I know what a topographic map is, how do I read it?

- First determine the contour interval (the distance between each contour line).
- Then determine the map scale. (usually at the bottom of the map)
- Identify any hills or depressions.
- Use the legend to identify human-made features.

Reading a topographic map cont.

- Look for areas where the contour lines are close together – they indicate a steep area.
- Look for areas where the contour lines are spread apart – they indicate a gentle slope.

Other Topographic Terms

- **Legend** – explains symbols used on the map.
- **Map scale** – compares distances on the map with distances on earth.

Map Scale

To create an accurate picture of a landscape on paper everything has to be made much, much smaller.

This is done by 'scaling down' the actual size of the land so that it fits on a piece of paper.

Map Scale

Definition:

Map scales indicate how much area a map covers.

The scale represents the ratio of a distance on the map to the actual distance on the ground

Map Scale

Scale is expressed as a fraction or ratio, such as 1:24,000 (i.e. 1 unit on the map equals 24,000 units on the ground).

The larger the second part of the number is, the more area is covered.

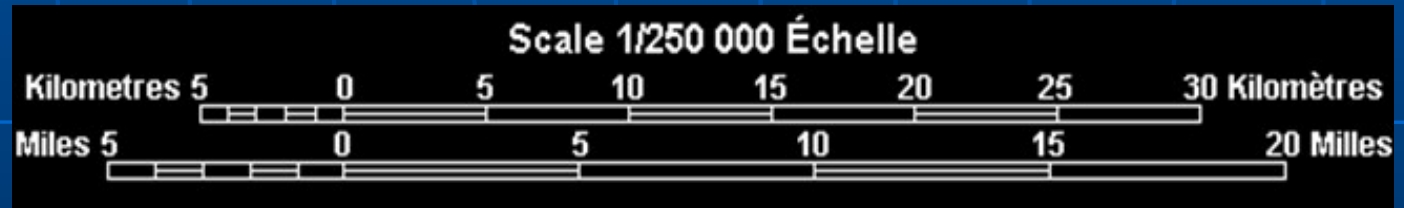
Three Scale Types: How scale is shown on a map

1) **Ratio or Fractional Scale:** - is a fixed ratio between linear measurements on the map and corresponding distances on the ground.

Examples: 1:25 000, 1:1 600 000

2) **Graphical scale:** - is simply a **line** or **bar** drawn on the map that is divided into units that represent ground distances.

Example:



3) **Verbal/written scale:** - is a convenient way of stating the relationship of map distance to ground distance.

Examples: 1 cm equals 1 km, 1 cm = 10 km

Ratio Scale

Maps with smaller scales generally show more detail.

For example: a map with a scale of 1:24 000 will show more detail than a map of 1:50 000.

Ratio Scale

On a map with a scale of 1:125 000, 1 cm on the map equals 125 000 cm on the ground.

Question: 1 cm equals how many km on the ground?

Step 1: How many cm in a km? → 100 000 cm in 1 km

$$125\ 000\ \text{cm} \div 100\ 000\ \text{cm} = 1.25$$

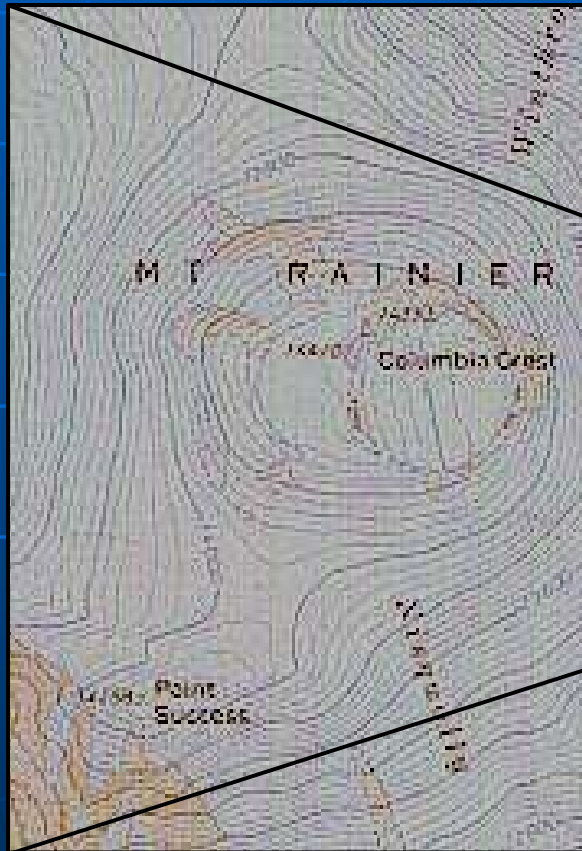
$$1\ \text{cm} = 1.25\ \text{km on the ground}$$

Graphical Scale (Bar or Line Scale)

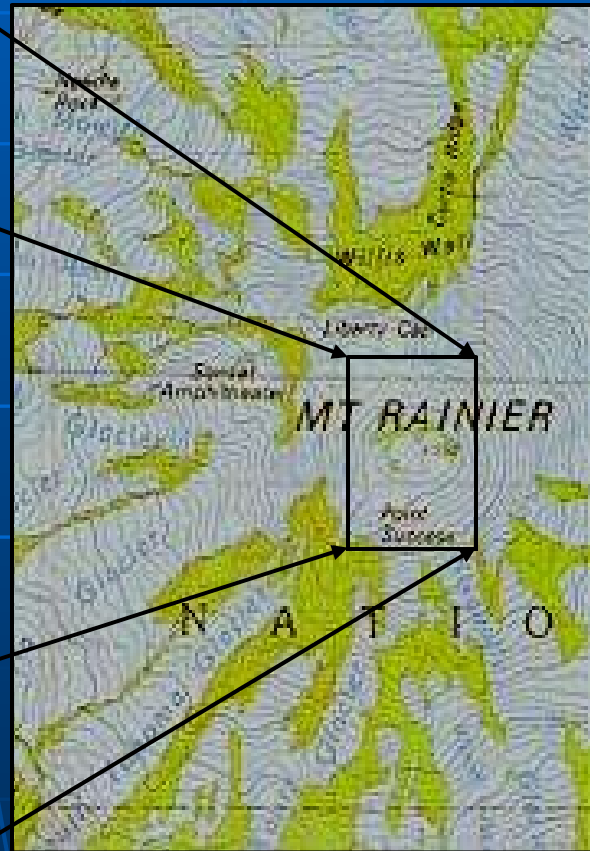
For a later date 😊

Scale

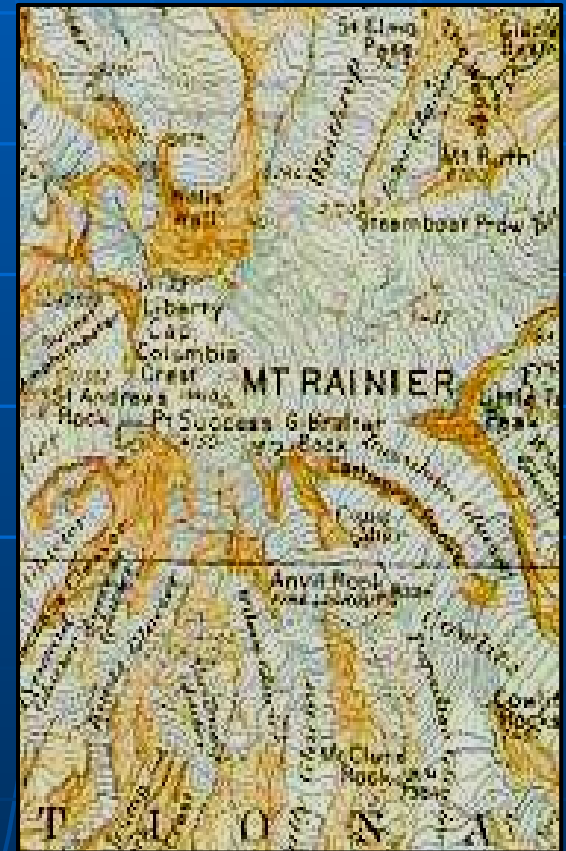
Decreasing Detail
Increasing Coverage



1:24,000 scale



1:100,000 scale



1:125,000 scale

Review Questions

- How are contour lines drawn on maps?
- How does a contour map show whether a slope is gentle or steep?
- What are index contours?
- What is a benchmark?
- How is a benchmark shown on a map?
- How is distance measured on a contour map?
- What are the three different map scales?
- Find the number of km on the ground that a map represents with a ratio scale of 1:24 000.