SCALE,
SCALE MODELS,
AND SKELETONS
SCALE:
a comparison of distances on a map to distances on the earth

METHODS OF PORTRAYING SCALE ON A MAP:

• Graphic Scale = scale bar
• Verbal Scale = written statement
• Fractional Scale = representative fraction

Scale gives us a concept for creating a model of the earth in either three dimensions (a globe) or two dimensions (a map).
What kind of scale?

“One inch to 5 miles”

Verbal scale
What kind of scale?

1:316,800 or 1/316,800

Fractional Scale

No unit of measurement is shown because the unit can be anything. If it is inches, then the statement is read this way: “One inch on the map equals 316,800 inches on the surface of the earth.”
What kind of scale?

Graphic Scale
A typical textbook illustration showing how maps vary in scale, in the proportion of the earth’s surface they are able to show on a single page. What two different methods are used to portray scale on these maps?
Would you agree that the same map is shown at two different scales? If so, the fractional scale on each map cannot be correct for both maps.
Scale: One of the “map essentials”!

What is missing? Any reference to map scale. Here are three maps in one – all produced at a different scale. Yet, a scale is shown on none of them.
When scale is not shown on a map – Beware!

An advertisement (Conde Nast Traveler) from 2007. When scale is not shown on a map – beware! On this map, Peru has clipped off Alaska so as not to show the Pacific Ocean at scale. The Japanese are wealthy enough to be world tourists (and they have historical connections with Peru). Their trip across the Pacific to Peru seems only as long as Europeans’ trip across the Atlantic.
Australia is larger than Asia is this travel ad. It's also a close neighbor of Mexico.
“Western Samoa The Cradle of Polynesia 1995” How could there be a reference to scale on this map. Samoa is made to look larger than the USA.”
A pattern develops, “lying with scale” (“lying with maps”) is something that many small island nations do.
Serving the South Pacific for over 40 years, Air Pacific, Fiji’s International Airline, is the only airline operating non-stop B747 service between Los Angeles and Fiji.

Along with our non-stop air service, we’re also offering the best selection of Fiji Vacation Packages through Air Pacific Holidays, operated exclusively by Brendan Tours.

**EXPERIENCE FIJI BEFORE EVER LEAVING THE GROUND.**

From the moment you board our 747, the spirit of Fiji will embrace you. From the caring manner of our experienced crew members to the warm smiles of our friendly service staff, you’ll enjoy the Fijian spirit from take-off to landing. And before you know it, you’ll touch down in Fiji, ready to explore the friendliest, most hospitable place on earth.

We have the Pacific covered!

Air Pacific is proud to be associated with Qantas Airways, our South Pacific Travel Partner.
Did we drift off into plate tectonic theory? What scale has been used to show the Atlantic Ocean?
A good example of what happens to scale under the influence of time-space compression. Here we literally see compression on the map.
Maps are often used to change perceptions. What is the scale of this map of the U.S.? What do we mean by perceptual scale?
These mushroom spores are too small to see, so we put them under a **MICROSCOPE**.

When we can see them, we can study them.
This planet is too big to see, so we put it under a MACROSCOPE.

When we can see it, we can study it.
“Some things are very tiny, and we must use complex electric and optical means (e.g., a microscope) to enlarge them so as to understand their configuration and structural relationships. In contrast, geographical things are so extensive that we must somehow reduce them to bring them into view.”

- Arthur Robinson, cartographer
Principle: We choose a scale to fit the task. Satellite image of the division between Europe and Asia. Is this the best map to use to show the site of Istanbul? No, but it helps us to understand the situation of Istanbul.
Which one of these is the best for examining the site of Istanbul? One is a radar image, the other an aerial photograph.
Draw back farther and you can see the real importance of Istanbul. It occupies the only place in Eurasia where you can pass through the east-west mountain barrier that separates subtropical Europe from northern Europe.
We need to use our . . .

MAPS as MACROSCOPES. . .

to help us think critically about problems and “problem spots” on the world stage.
Scale is Critical to Critical Thinking

• Using reason to decide what to believe or do.

• Assessing the authenticity, accuracy, or worth of knowledge claims and arguments.

• Applying careful, precise, persistent and objective analysis of any knowledge claim or belief to judge its validity.
Format of Many pre-1914 German School Atlases

Used in German schools before World War I. Note the use of the fractional scale. Why do you think the fractional scale was used instead of a graphic scale? The fractional scale is not as intuitive and not easy to read. The US and Germany look to be about the same size.
Comparative Size of Germany and USA in 1914

If we maintain the same scale for both countries, this is how they compare in size.
THE AGGRESSOR NATION?

GREAT BRITAIN

26% OF THE WORLD
(THE BRITISH EMPIRE)
MODEL:
an abstract representation of reality created to simplify complex systems

TYPES OF MODELS:

• Graphic Models = Visual (2-D and 3-D)
• Verbal Models = Textual
• Mathematical Models = Formulaic
What kind of model?

\[ l_{ij} = \frac{P_i \cdot P_j}{d_{ij}} \]
What kind of model?

STAGES OF ECONOMIC DEVELOPMENT
Stage 1 Traditional Society
Stage 2 Transitional Stage
Stage 3 Take Off
Stage 4 Drive to Maturity
Stage 5 High Mass Consumption

Verbal Model
What kind of model?

Graphic Model (2-D)
Which one is the model?
Which one is the model?
Find the large island south of Sicily. What is it?
Why might the map maker have chosen to exaggerate the size of Malta?
What’s missing?