

Grand Canyon Cross Section Tutorial

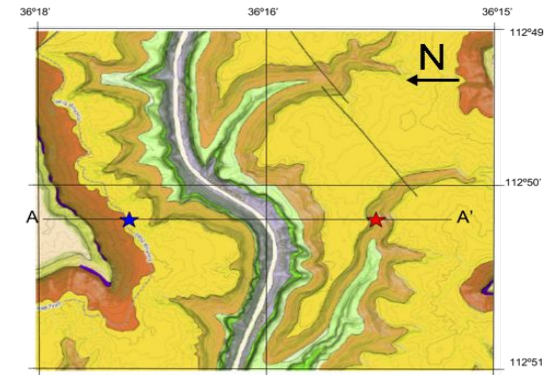


The Situation

- Some local geologists are trying to understand the composition of the rock in the Grand Canyon. After hours in the library collecting information that others have shared and talking to the locals, they have made some predictions about the rock compositions, but they need to verify that their predictions are correct.
- Our geologists determine their first step is to make a cross section based on the map, so they can create a hypothesis that reflects their predictions.
- Can you help them?
- First there are a few things you need to know...

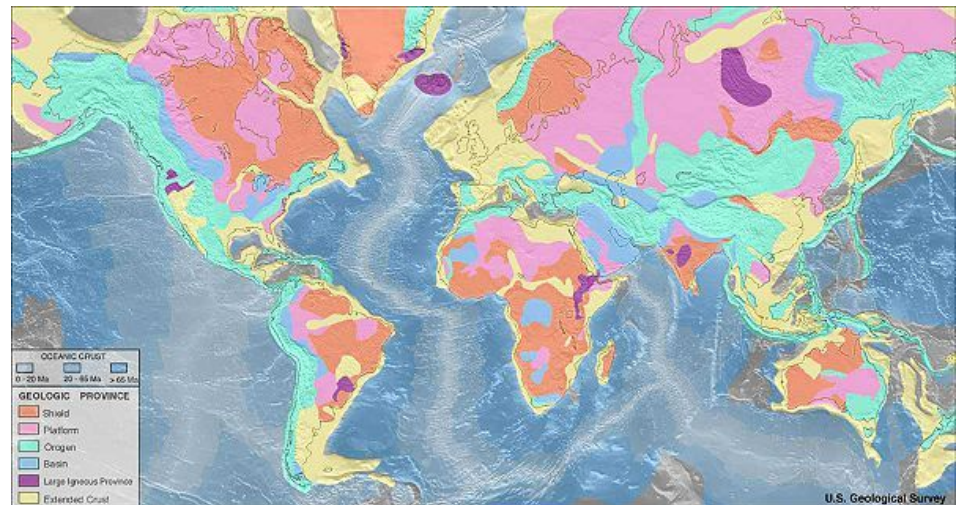
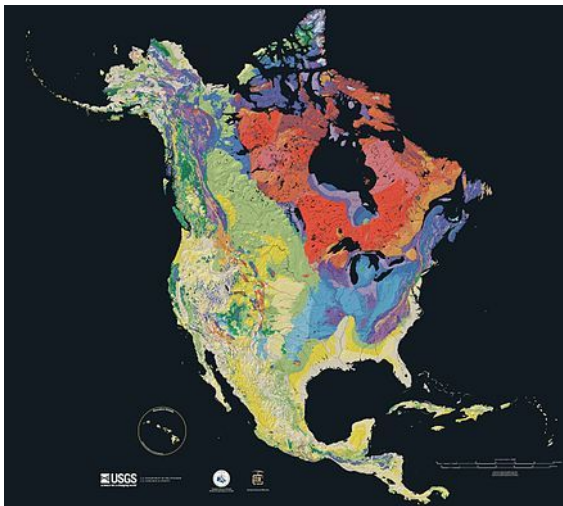
Background: What do these geologists do?

- Geologists are interested in the structure of layers of rock under Earth's surface.
- Geologists use representations called geologic maps to illustrate what rock layers are exposed at the surface of the earth.
- They also use representations called topographic maps to illustrate the shape and elevation of the land's surface.



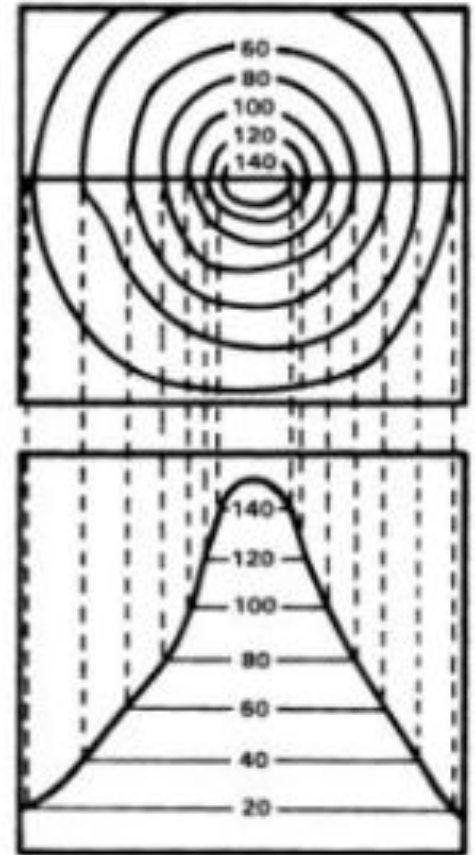
Background: The Geologic Map

A geologic map is made to show geological features. Different types of rock are shown by different color to indicate where they are exposed at the surface.



Background: The Topographic Map

- This type of map shows the elevation of an area of land.
- The elevation is represented by contour lines. The numbers along these lines indicate the elevation at a certain point on the map. The difference of the numbers is referred to as the contour interval.
- What is the contour interval for the map on the right?



Answer: This map has a contour interval of 10.

Part 1: Make A Cross-Section

- Raheem, Hank and Bev have to sketch a cross section to be able to record where the observations are made, make predictions, and create and evaluate hypotheses.
- Why might they want to record their observations?
- What predictions might they make?
- Why hypotheses might they make?
- A cross-section is a drawing that shows what the inside of something looks like after a cut has been made across it.
- Imagine slicing into a layer cake so that you can see the inside.
- The inside is the cross-section.



Part 2: Core Sample Comparison

- Our geologists take core samples to see the way rocks are layered under the surface.
- They use a special drill that fills a steel tube with rock.
- The cylinder of material that they remove, called the core sample, is analyzed.

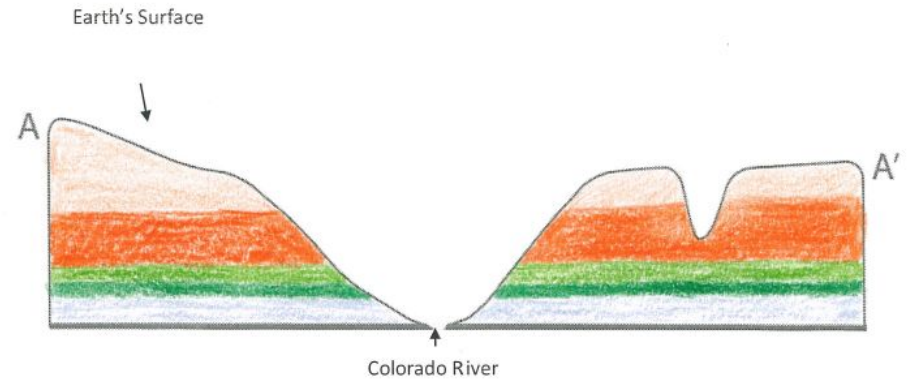


Part 4: Why are these layers flat?

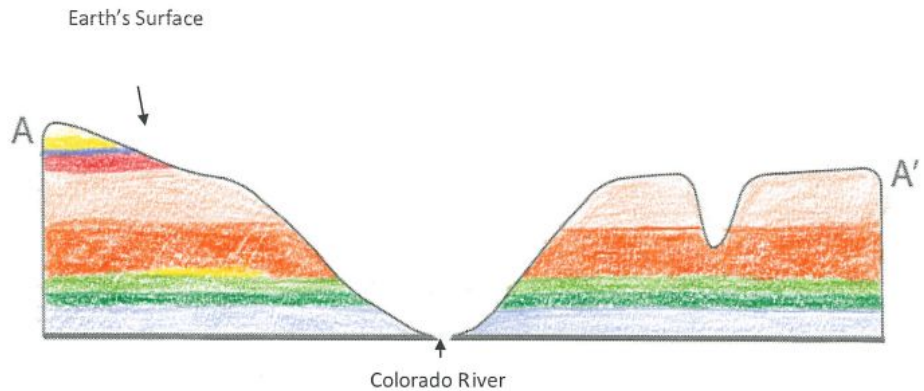
- The Principle of Original Horizontality is a foundational theory in the science of geology.
- Does anyone know this law or have they heard of it?
What does it explain?

Answer: The Law of Original Horizontality states that the rock layers we see today were originally deposited horizontally and any deformation must have occurred at a later point in the rock forming process.

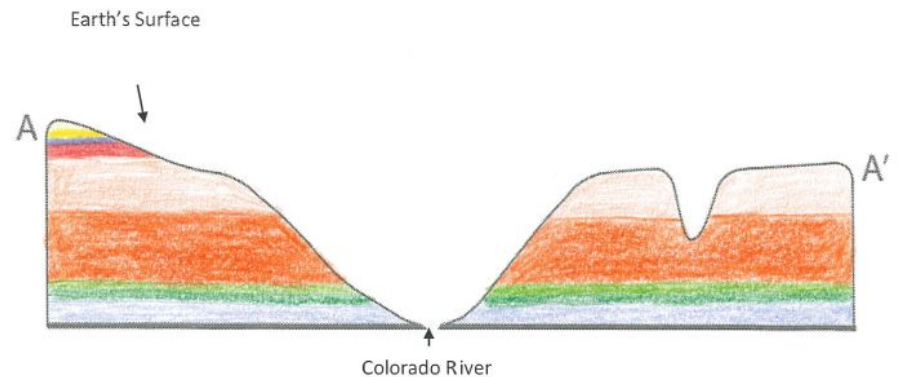
Raheem's cross-section



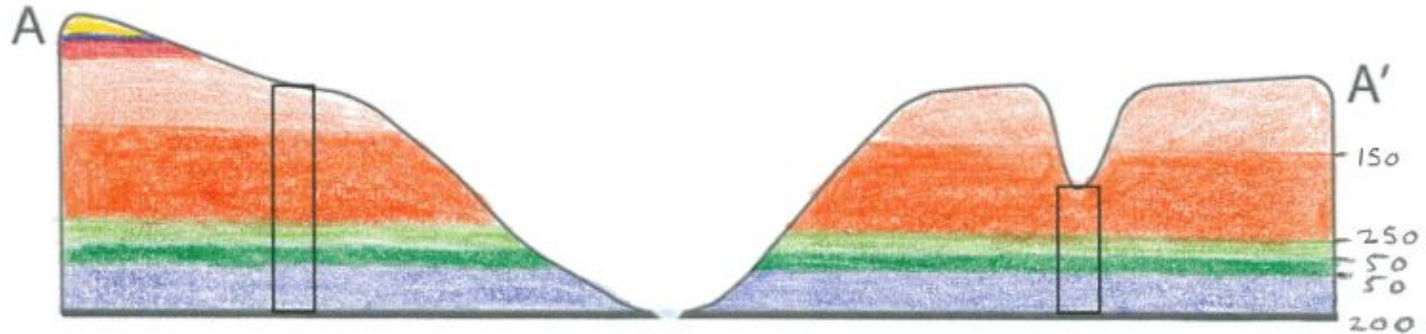
Hank's cross-section



Bev's cross-section



Bev's revised cross-section



Raheem's revised cross-section

