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Lab – A Model of Three Faults

Background Information:

Faults are often (but not always) found near plate boundaries. Each type of fault is often related to specific types of plate movements.

- **Normal faults** are often associated with extensional forces as a result of a divergent boundary
- **Reverse faults** are often associated with compressional forces as a result of a convergent boundary
- **Transform faults** are often associated with strike-slip forces as a result of a transform boundary

The stresses and strains in the Earth's upper layers have many causes: thermal expansion and contraction, gravitational forces, volume changes due to mineral phase transitions, etc. Faulting is one of the methods of mechanical adjustment or release of such stress and strain.

Materials:

Scissors Fault Model Colored Pencils
Glue Construction Paper

Procedure:

1. Color the fault model according to the color key.
2. Cut the fault model making sure to include the tabs.
3. Glue the fault model to the piece of construction paper and once again cut it out making sure to leave the tabs attached.
4. Fold each side of the fault model down to form a box with the drawn features on the top.
5. Tape or glue the corners of the model together. This box is a three dimensional model of the top layers of the Earth's crust.
6. The dashed lines on your model represent a fault. Carefully cut along the dashed line. You will end up with two pieces.

Color Key:

Rock Layer X – Green	Rock Layer Z – Orange	Road – Brown
Rock Layer Y – Yellow	River – Blue	Grass – Green

Adapted from USGS Learning Web – A Model of Three Faults
http://interactive2.usgs.gov/learningweb/teachers/faults.htm

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Analysis: Modeling the Faults

A. Normal fault

1. Locate points A and B on your model.
2. Move point B so that it is next to Point A.
3. Observe your model from the side (its cross-section).
4. Draw the normal fault as represented by the model you have just constructed.

Normal Fault Diagram

Questions:

1. Which way did point B move relative to point A?

2. What happened to rock layers X, Y and Z?

3. Are the rock layers still continuous?

4. What likely happened to the river? The road? The railroad tracks? Explain your answer.

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B. Reverse fault:

1. Locate points C and D on your model.
2. Move point C next to point D.
3. Observe the cross-section of your model.
4. Draw the reverse fault as represented by the model you have just constructed.

Reverse Fault Diagram

Questions:

1. Which way did point D move relative to point C?

2. What happened to rock layers X, Y and Z?

3. Are the rock layers still continuous?

4. What likely happened to the river? The road? The railroad tracks? Explain your answer.

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C. Transform fault:

1. Locate points F and G on your model.
2. Move the pieces of the model so that point F is next to point G.
3. Draw an overhead view of the surface as it looks after movement along the fault.

Transform Fault Diagram

Questions:

1. If you were standing at point F and looking across the fault, which way did the block on the opposite side move?

2. What happened to rock layers X, Y and Z?

3. Are the rock layers still continuous?

4. What likely happened to the river? The road? The railroad tracks? Explain your answer.

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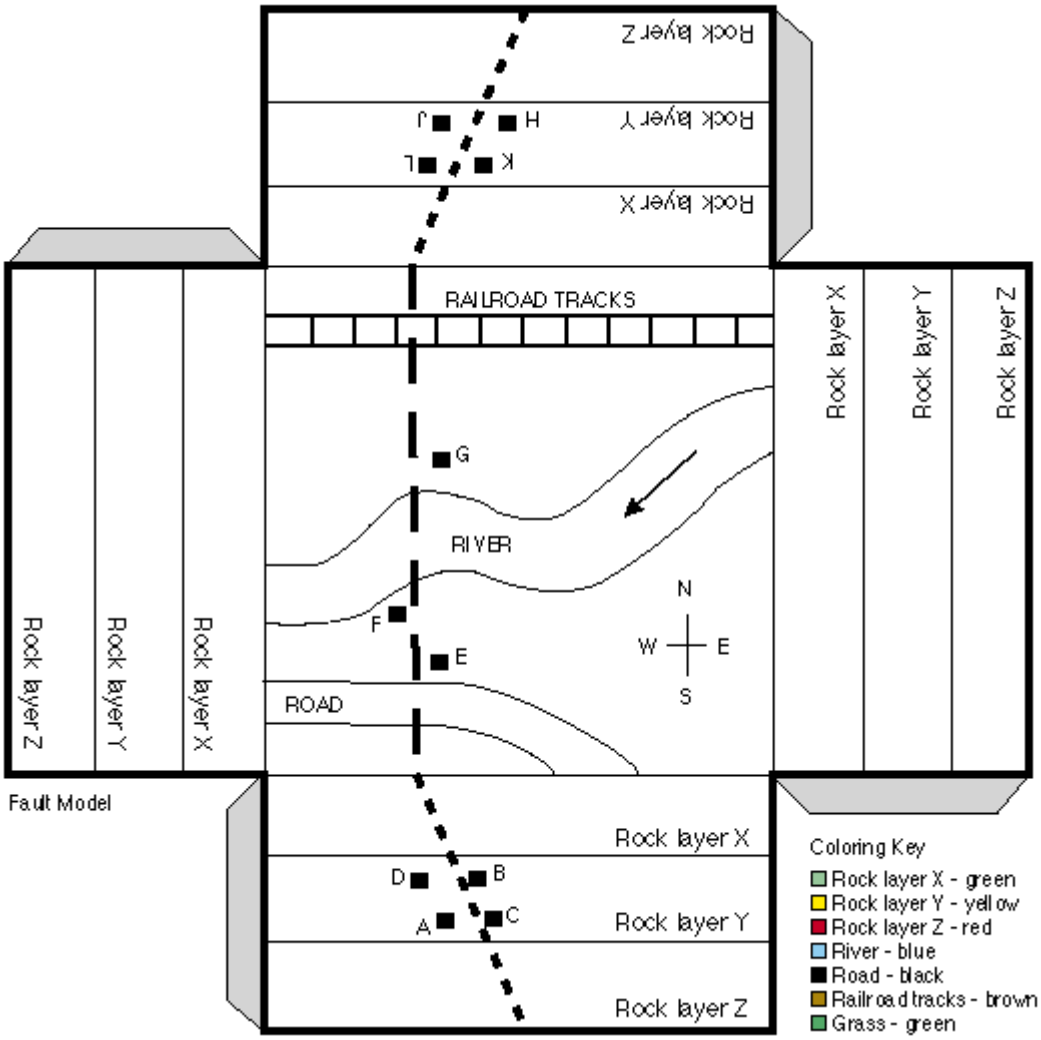

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