

Up and Down Fault Blocks

Lesson Concept Exposed rock layers indicate the type of fault.

Link This lesson builds on the models of faults developed in 6.3 and connects the model to exposed rock layers in the earth. The rock layers are evidence for identification of type of fault. The next lesson in 6.5 applies understanding of examples of faults by examining the strike-slip (San Andreas) fault.

Time 100 minutes (two to three class periods)

Materials

Whole class

Road cut photos

Per Group (groups of 4)

Glue bottles

Individual

H1 (Fault Block Directions)

Scissors

White paper (or other light color) 12" x 18"

Colored construction paper (not white) 9"x12"

2 Sets of 6 colored strips (1/2" x 12"

Dark colored marker

Advance Preparation

1. Cut out a class set of 9"x12" colored construction paper
2. Select 2 additional colors for layers and cut into 1/2" x 12" strips. Cut more than is needed. Each student needs a minimum of 6 strips per color.

Teacher Note: These will be the earth layers, so select colors accordingly. Suggestions – yellow, orange, brown, gray, etc. Allow plenty of time for cutting since it is rather time consuming.

3. Create a teacher model of activity to use as a demonstration.
4. Duplicate **H1 (Fault Block Directions)**.
5. Find several road cut photos to share (could use same ones found for Plate Tectonic unit) showing layering of rock.

Procedure:

Engage (15 minutes) *Exposed earth's layers show faulting.*

6.4 Up and Down Fault Blocks: Earthquake and Volcanoes

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*SCIENCE MATTERS

Teacher Note: Use several different types of road cut photos for steps 1-4. These can be picture sets on student desks, digital pictures for the whole class or in a book under the document camera.

1. Teacher displays road cut photos to students and asks students to observe the rock or hill next to the road. What do you notice about the rock next to the road?
2. Ask students to describe the rock layers of each picture to a partner.
3. Ask partner students to come to the front of the room and show layers in the photo(s) by mirroring with their hands?
4. Ask students to discuss with a partner whether all the layers are horizontal. Discuss what might make the layers not horizontal. Share ideas with the class.
5. Explain to students that we will make models of different faults using paper strips to represent layers of rock. The models can be used to help remember the different ways rocks will layer during a fault movement.

Explore **(40 minutes) Fault blocks demonstrate how pressures inside the Earth forms blocks of land by pulling apart, compressing, or slipping past each other**

6. Distribute one 9"x12" sheet of colored paper and two sets of six (½" x 12") stripes of colored paper to each student.
7. Ask students to glue alternating color stripes on 9"x12" paper using the background color as one of the striped colors keeping the same pattern between the three colors throughout the whole page.
8. Ask students to cut colored striped paper into fourths by cutting in half, then cut each half in half.
9. Distribute 12" x 18" poster paper.

Teacher note: This needs to be done, step by step, together for #1 & #2 on H1. For #3 on H1, the teacher needs to model a Normal Fault and have all students do that one together. Have them glue this first one onto the 12"x 18" paper (horizontal works best so all 4 will fit). Glue each one as it is cut.

10. Teacher models to class how to draw and cut creating a Normal Fault.
11. Ask students to recreate a Normal Fault and paste onto poster.
12. Discuss with your partner which of the pictures used in step 1 & 2 is a normal fault.
13. Ask students to select three other type faults and proceed to draw, cut and paste onto poster.

Explain **(25 minutes) Fault blocks will demonstrate how land moves due to different pressures.**

Teacher note: Text Book diagrams should help students in drawing movement and stress arrows.

14. Ask students to use a dark marker to label each fault on the poster with: correct name, direction of movement with thin arrows, direction of stress with thick arrows and Footwall and Hanging Wall if fault contains them

Extend **(10 minutes) Fault blocks will demonstrate how land moves due to different pressures.**

15. Ask students to write a short summary on the back of the poster describing the movement of one of their faults including: fault type, direction of movement, type of stress and direction moved, label if it is footwall or hanging wall and explain how you know.

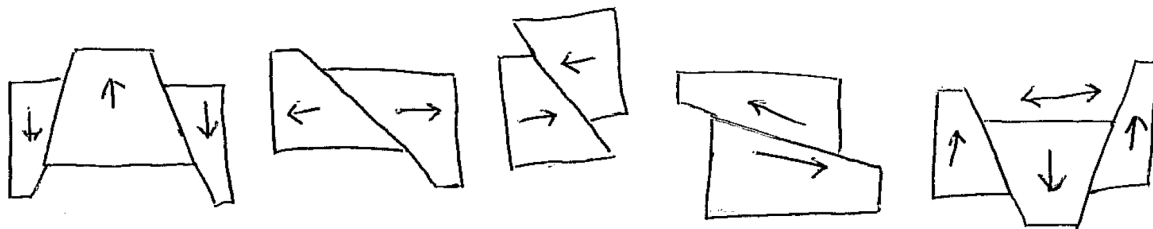
Evaluate **(10 minutes) Exposed rock layers indicate the type of fault.**

16. Teacher shows road cut photos from beginning of lesson and leads class discussion. Ask students to think, pair, share comparing the formations in the photos to their Fault Block Poster.
17. Show one additional road cut photo. Ask students to write an explanation of possible geological processes that formed the road cut photo based on faults modeled on poster.

FAULT BLOCK DIRECTIONS

1. Glue alternating color stripes on 9x12 paper using the background color as one of the strip colors - keep pattern the same.

2. Cut colored strip paper in 1/4ths
 3. Select 4 Fault block models & draw one of each on each of the squares



Fault block Mountain Normal Reverse (Thrust) Strike-slip (Lateral) Graben

4. Cut faults and glue to poster paper.

5. Label with (in black pen):

- a. Fault names
 - b. Direction of movement (thin) and stress arrows (thick)
 - c. Footwall and Hanging wall (if it has them)
6. Include Title - TYPES OF FAULTS, name and # in bottom corners