Rock-Layer Reconstruction

Classroom-ready printable pack · Grades 5–8

Pack contents
Two identical strata, fossil, fault, intrusion, and erosion sets with cross-section mats. Two student sets are included.

Teacher directions

1. Give each partner a cross-section mat and one identical geology set.
2. The Describer chooses a challenge card and arranges layers from bottom to top before adding any fault, intrusion, fold/tilt, fossil, or erosion surface.
3. The Describer explains relative positions and cross-cutting relationships. The Builder recreates the section.
4. Compare with the reference. State relative age only; do not assign numerical ages without evidence.

Before class

- Print at 100% on US Letter paper. Use cardstock or laminate for reuse.
- Cut on the thick solid borders. Keep Set A and Set B separate.
- Give challenge/model cards only to the Describer.
- Use a folder, book, or tabletop barrier so partners cannot see each other’s work.

Accessibility and accommodations

Start with four undisturbed layers and the superposition strip. Add faults or intrusions later. Layers use different edge patterns and labels, not color alone.

Storage-envelope labels

Rock-Layer Reconstruction
Set A — Describer
Count pieces before storing.

Rock-Layer Reconstruction
Set B — Builder
Count pieces before storing.

Rock-Layer Reconstruction
Challenge / model cards
Count pieces before storing.

Rock-Layer Reconstruction
Teacher reference
Count pieces before storing.

Student language supports

Position: above · below · beside · between · near · far · left · right · clockwise
Clarify: “Please repeat…” · “Is ___ beside ___?” · “What should I place next?”
Compare: same · different · rotate · move · replace · sequence

Movable pieces

Set A

Cut on the solid borders. This set is identical to the partner set.

sandstone layer A

shale layer B

limestone layer C

conglomerate layer D

volcanic ash layer E

shell fossil

leaf fossil

trace fossil

fault plane

igneous intrusion

erosion surface

fold / tilt marker

Movable pieces

Set B

Cut on the solid borders. This set is identical to the partner set.

sandstone layer A

shale layer B

limestone layer C

conglomerate layer D

volcanic ash layer E

shell fossil

leaf fossil

trace fossil

fault plane

igneous intrusion

erosion surface

fold / tilt marker

Geologic cross-section

Cut the page in half. Both partner mats are identical.

Set A — Geologic cross-section

surface at top • oldest area usually at bottom • left/right correlation zones

top / far

center

bottom / near

Set B — Geologic cross-section

surface at top • oldest area usually at bottom • left/right correlation zones

top / far

center

bottom / near

Describer-only challenge cards

Keep these cards hidden from the Builder.

Challenge 1: Undisturbed sequence

Place A at bottom, then B, C, and D.

A is oldest; D is youngest.

Challenge 2: Fossil correlation

Put the same shell fossil in matching layer B on both sides.

matching fossils can support correlation

Challenge 3: Fault after deposition

Stack A–D, then place a fault cutting all four.

fault is younger than A–D

Challenge 4: Intrusion after layers

Stack A–C, then add an intrusion cutting them.

intrusion is younger than A–C

Challenge 5: Erosion and new layer

Stack A–C, add an erosion surface, then D.

missing time lies below D

Challenge 6: Tilted layers

Arrange A–D in order, then rotate the whole sequence.

tilting happened after deposition

Rock-Layer Reconstruction reference

Geology reference

Superposition: in an undisturbed sedimentary sequence, the lowest layer is oldest and the highest is youngest. **Original horizontality:** sedimentary layers are generally deposited horizontally; tilting/folding occurred later. **Cross-cutting:** a fault or igneous intrusion is younger than the rocks it cuts. **Unconformity:** an erosional/nondepositional surface represents missing time.

> Faults can move layers up, down, or sideways. Fossils help correlate layers, but a card alone does not establish an absolute age. These are simplified cross-sections, not scale models.

Principles checked against U.S. Geological Survey educational resources on strata and relative time.

Quality check after a round

- Can each student identify pieces by shape or label without relying on color?
- Do both models match in pieces, order, orientation, and relative position?
- Which direction was most precise? Which should be revised?