

Multiple Choice

1. In the spring, rocks often fall onto mountain roads. Why?
 - A. The rocks have grown during winter.
 - B. Ice freezes in the rocks at night, cracking them.
 - C. The days are longer with more light.
 - D. The snow is no longer holding them.

2. Landscape Arch in Arches National Park had to be closed to visitors hiking near the base. How could an arch become dangerous?
 - A. Weathering made it possible for it to collapse.
 - B. Ice could fall off of it, harming the visitor
 - C. Snakes are attracted to some arches.
 - D. The soil around the arch became polluted.

3. Many valleys in Northern Utah are U-shaped which shows a glacier carved them. How long does it take a glacier to carve a valley?
 - A. Less than a year
 - B. 10 to 20 years
 - C. 100 years
 - D. Thousands of years

4. How do volcanoes, earthquakes, and uplift affect Earth's surface? They create ...
 - A. deep ocean basins
 - B. great plains of rich soil
 - C. mountains and valleys
 - D. arctic ice caps

5. A seismograph is a device used to measure wave movement through Earth's crust. What does it measure the wave movement of?
 - A. earthquakes and volcanoes
 - B. floods and hurricanes
 - C. snowstorms and avalanches
 - D. drought and rainfall patterns

6. The Grand Canyon resulted from two forces. What are they?

- A. weathering and erosion
- B. erosion and uplift
- C. earthquakes and faulting
- D. volcanoes and magma

7. How long has it taken for the Grand Canyon to form?

- A. 100 years
- B. 1000 years
- C. 2000 years
- D. Over 5,000 years

Use this drawing to answer the next two questions.



8. What forces have made this butte?

- A. volcanoes and earthquakes
- B. weathering and humans
- C. water erosion and uplift
- D. glaciers and ice

9. In 100 years, how long will this butte change?

- A. It will change very little.
- B. It will be half its size.
- C. It will be gone.
- D. A hole will form in the ground.

Answers Standard 2 Unit Test 1:

Multiple Choice:

1. B
2. A
3. D
4. C
5. A
6. B
7. D
8. C
9. A

Constructed Response

1. Water erosion: Water carries rock out of the valley and digs deeper into the valley floor. Gravity: pulls rock down from the sides of the valley. Wind: blows soil into the rivers, rounds and polishes the remaining rock.
2. A landslide, rockfall or flood can change Earth's surface quickly. Erosional changes that occur slowly are valley, canyon, and arch formations.
3. They create mountains, valleys, or canyons.

Multiple Choice

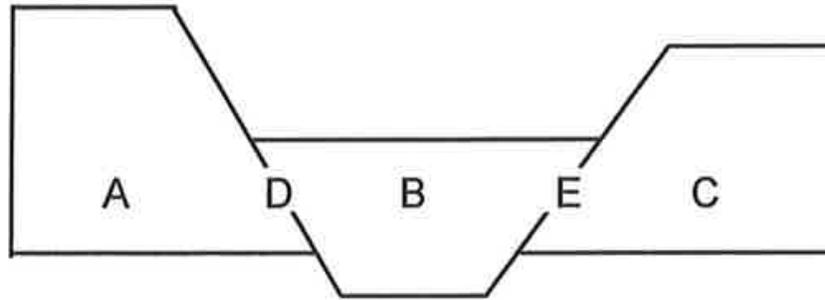
1. A student went to his favorite river to fish on vacation one summer. When he got there, it had all changed. Why?
 - A. He must have forgotten where it was.
 - B. Wind can blow rocks into rivers.
 - C. Erosion by rivers can change their course.
 - D. Ice in the winter can cause fish to die.

2. If erosion is the only force acting on a mountain, what happens to its size. It becomes...
 - A. smaller
 - B. larger
 - C. harder
 - D. softer

3. What causes earthquakes, volcanoes and uplift of Earth's surface?
 - A. wind
 - B. water
 - C. glaciers
 - D. gravity

4. What causes earthquakes, volcanoes and uplift of Earth's surface?
 - A. the pull of gravity from the moon and sun
 - B. movement of Earth's crust
 - C. objects from space that strike Earth's surface
 - D. new rocks forming on Earth's surface

Use this drawing of a cross section of Earth's crust to answer the next three questions.



5. What direction are A and C Moving?

- A. apart
- B. together
- C. toward B
- D. up and down

6. What might happen when movement occurs at "D" and "E"?

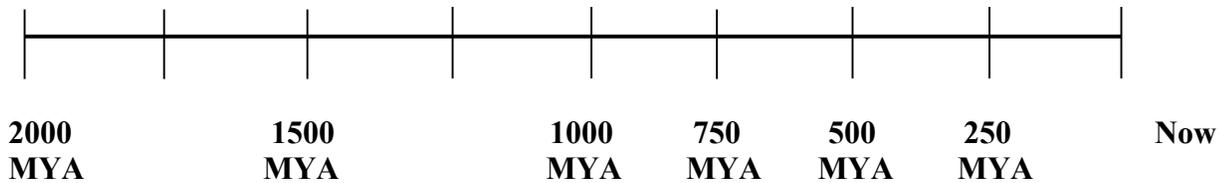
- A. a volcano
- B. erosion
- C. earthquake
- D. a streambed

7. What physical features have been formed by the movement of Earth as shown in the diagram?

- A. volcanoes and floods
- B. rivers and an ocean
- C. plateaus and a mesa
- D. mountains and a valley

Constructed Response

Place the letter of the events indicated on the correct place on the timeline, then answer the questions. The events are listed by the time they began. MYA means million years ago. Then answer the next 7 questions.



Geologic Events that occurred in Utah.

- A. 2000 MYA: “basement” rocks deposited
- B. 1000 MYA: Utah is under warm seas
- C. 350 MYA: Sand and mud deposited in thick layers
- D. 200 MYA: Desert environments, sand dune deposits
- E. 100 MYA: Mountain building and compression of land
- F. 65 MYA: Uplift of Uinta Mountains
- G. 35 MYA: Volcanic activity occurs, above and below the ground
- H. 15 MYA: Earthquakes, glaciers, Lake Bonneville, water erosion

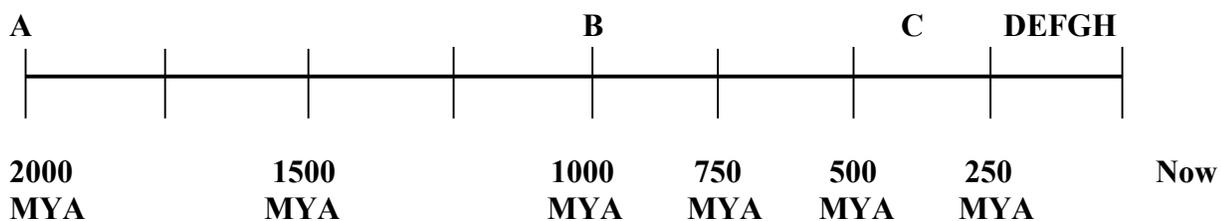
1. How is geologic time measured?
2. Why?
3. What geological evidence did Lake Bonneville leave behind?
4. How do geologists know that sand dunes existed in Utah millions of years ago?
5. How does this timeline help explain the many different geologic features found in Utah?
6. Which part of Utah Geologic History do we seem to know about the most about?
7. Why?

Answers Standard 2 Unit Test 2:

Multiple Choice

1. C
2. A
3. B
4. B
5. A
6. C
7. D

Constructed Response:



1. Geologic time is measured in millions of years.
2. Because the span of time is so large.
3. Lake Bonneville left terraces cut into the sides of valleys in Northern Utah.
4. The sand dunes form a certain type of rock when they are buried.
5. Utah has had a lot of different geologic things happen in it and they form different types of features.
6. We seem to know the most about recent history.
7. Because it has left the most recent marks on the land.

Activity Description

Students will use pictures from magazines to identify types of erosion.

Prior Knowledge Needed

Students should know that erosion changes the shape of the land in many ways. Water, wind, glaciers, and gravity are the agents of change and they create many scenic landscapes.

Materials

Pictures of landscapes from magazines such as *national Geographic*, *Arizona Highways*, or other nature magazines. You may ask students to bring these in or you might see if your IMC has surplus magazines. Worksheet printed on the next page needs to be reproduced.

Time Needed

If students are finding pictures, 2 one-hour periods are needed. If pictures are provided for students one hour should be enough.

Procedure

1. If students are finding pictures, hand out magazines and explain that you want them to find pictures of Earth landscapes and cut them out. After students bring their pictures to you, sort through them and pick out the most representative of the landscapes you want to focus on.
2. Glue the pictures on heavy paper and with a marker, place an asterisk (*) on the area of the picture you wish the students to name. Number and laminate the pictures if you wish. (10-15 are needed; save them and use them again!)
3. The next day, hand out the worksheet (p. 9.3.10) and go over the directions with students.
4. Write a list of the names of landscape features on the board (ex. Arch, canyon, valley, butte)
5. Allow students time to work. They will need to pass the pictures around the room so they can see all of them. They should fill in their data as they go.
6. Discuss the students' identifications before they start the questions. Make sure they have correctly identified the pictures.

Scoring Guide

1. Student works to find pictures (some students will be "luckier" than others, depending on the magazine they get) 5 pts.
2. Student completes data table 15 pts.
3. Student correctly answers questions 5 pts.

Questions:

1. Which type of erosion was most common in the pictures you saw?
2. Were there any pictures where wind was the main type of erosion? Why?
3. Which pictures showed landscapes formed by rapid change? Slow?
4. If you look out your classroom window or door, what evidence do you see of different types of erosion?

Answers:

1. Probably water erosion.
2. Probably not, wind is not a powerful erosional force. It polishes rock surfaces and blows sand around, but doesn't carry large loads like water or glaciers.
3. Rapid change would be rockfalls, landslides, or floods. Slow changes would be arches, canyons, or buttes.
4. Students may need help figuring out what to look at.

Activity Description

Students will use salt clay to model different landforms. They will describe the forces that created the landforms.

Prior Knowledge

Students should know that landforms are made when a combination of geologic events occurs, such as uplift and erosion forming a canyon.

Materials

- Salt Dough Clay Recipe:
 - 1 c flour
 - ½ tsp. salt
 - 2 T Cream of Tartar
 - 1 T oil
 - 1 c water
 - Food coloring

Mix all ingredients in saucepan, cook until dough stiffens, knead for 3 minutes.

- Cardboard piece to place feature on
- Students will need access to reference materials to research their feature

Time Needed

2 hours on different days

Procedure:

1. Explain to students that they will be working groups of 2-3 to make a landform from clay. Assign or allow each group to pick a landform from this list:
arch, butte, mesa, valley, canyon, flood plain, alluvial fan, volcano, mountain range, glacial features (horn, U-shaped valley, hanging valleys)
2. Give students salt dough recipe and ask them to bring a batch of any color for the day, you wish to finish the project. Remind them to have help when cooking. All students will not remember to bring clay, but hopefully enough will. Tell them to roll it in a ball after it cools, and bring it in a plastic bag, or it will dry out.
3. Give students an opportunity to research their landform and find out what it looks like and how it forms. Have them write a paragraph explaining it.
4. On the day of the project, have students share their clay so that they may have several colors, if needed (to show sedimentary layers for example)
5. Students should build their features on the cardboard and place their paragraph explanations next to them.
6. Allow students time to look at all the other students' landforms.
7. Students will share forces that caused the landforms created.

Scoring Guide:

1. Students research and report with a paragraph on their feature 15 pts.
2. Students sharing of landform causes 10 pts.
3. Students build accurate (recognizable) model of their feature 10 pts.

Activity Description:

Students will build and use “fault block” models to understand how movements in Earth’s crust create valleys and mountains. This could also be done as a teacher demonstration with a large model.

Prior Knowledge

Students should know that Earth’s crust can move in three different directions: apart (tension), together (compression) or sideways (shear). As Earth moves in these directions, stress builds up and breaks occur along faults. Slipping along the faults causes earthquakes to occur.

Materials

Diagrams (p. 9.3.16 and 17), scissors, tape or glue, markers or color crayons.

Time Needed

1 or 2 hours

Procedure

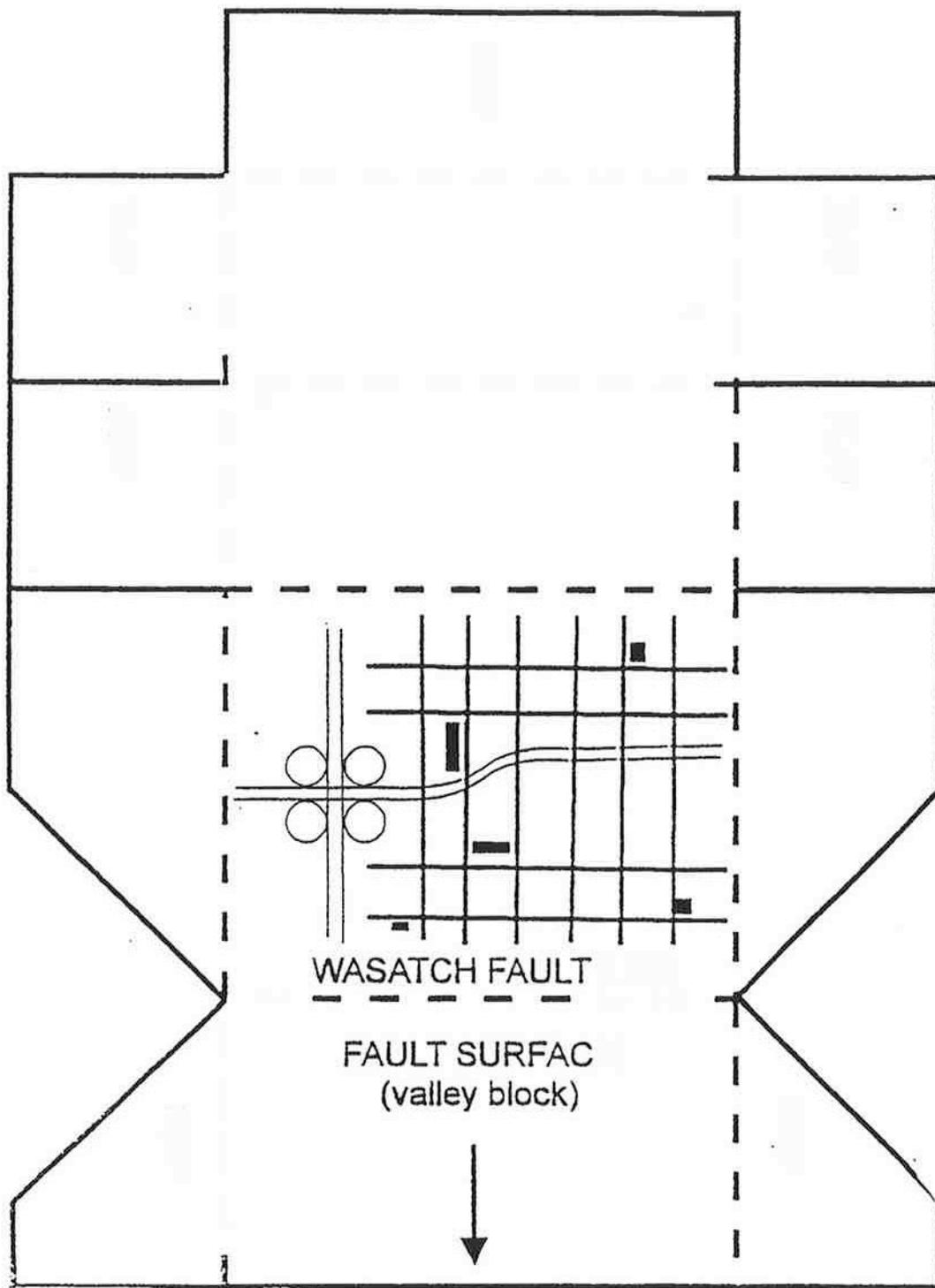
1. Students may color the blocks but it is not essential.
2. Blocks should be cut out and taped or glued together along lines indicated.
3. Students should manipulate the blocks to answer possible questions or observations:
 - a. Line the blocks up so that the top is flat. Gently pull them apart. Draw what you see.
 - b. What would be the names of the features formed?
 - c. What are the lines along which the blocks moved called?
 - d. Put the blocks back together and gently push them close. Draw what forms.
 - e. What would be the names of the features formed?
 - f. Put the blocks together and slide one past the other sideways. Draw what forms.
 - g. Has a feature formed now?
 - h. Is there evidence that Earth has moved?
 - i. Which forces have created the Wasatch Mountains?

Scoring Guide:

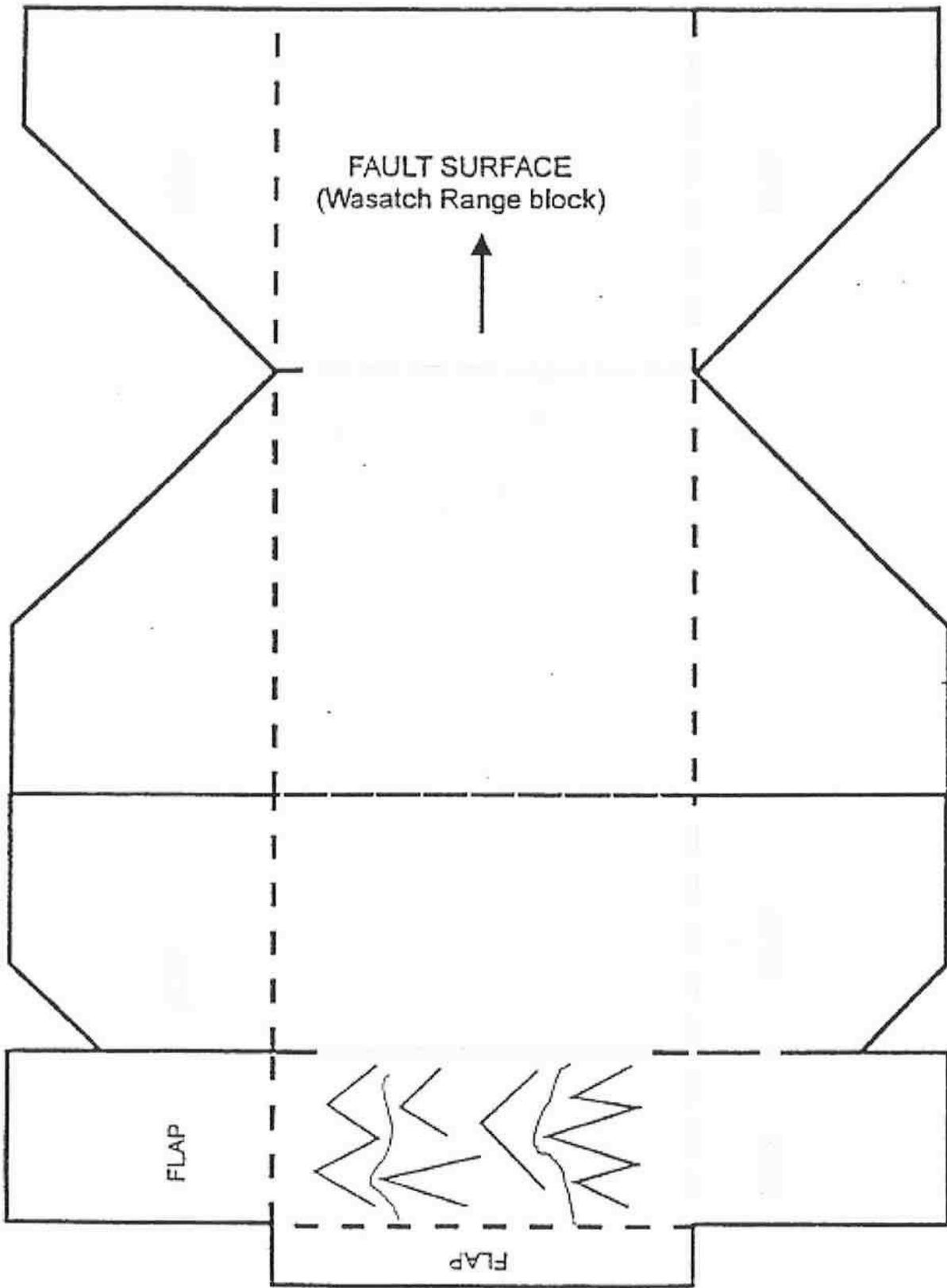
1. Students correctly cut and glue blocks together 10 pts.
2. Students manipulate the blocks to answer questions or make observations 5 pts.
3. Students correctly answer questions 8 pts.

Answers to questions:

- a. drawing/observations
- b. valley and mountain
- c. fault
- d. drawing/observations
- e. mountains
- f. drawing/observations
- g. no feature
- h. stream is offset
- i. compression



Wasatch Valley Fault Block



Wasatch Mountain Fault Block