PART TWO

Some Processes that Change the Earth's Surface

NEXT GENERATION SCIENCE STANDARDS:

To prepare students to understand the content introduced at middle school, this series of lessons used in conjunction with the STC *Land and Water* Unit and/or the *FOSS Landforms* Unit, will acquaint students to the changes to the earth's surface caused by earthquakes, landslides, and volcanic eruptions.

MATERIALS:

FOR EACH STUDENT:

1. Science notebook
2. *Volcano Inside/Outside-Before/After* Template
3. Post Assessment Concept Map black line copy for each student or students may draw their own in the science notebook

FOR THE CLASS:

1. *Volcanoes!* By *Time for Kids* with Jeremy Caplan
2. Teacher Directions for *Volcano Inside/Outside-Before/After* Template
3. Question Quilt
4. 3' X 5" Cards/Post-it Notes
5. Video Clips from National Geographic website- http://video.nationalgeographic.com/video/player/environment/index.html (Search on "volcano")
6. Volcano Flipbook Samples (found in this set of lessons)
7. Colored Pencils
8. Glue Stick or Tape
9. Scissors

PREPARATIONS:

Read through Teacher Directions for the *Volcano Inside/Outside-Before/After* Template. Run copies of the template for each student.

Make copies of the Post-Assessment Concept Map for each student

PROCEDURE:

1. Briefly review the previous lesson by asking students: "What are some of the processes that change Earth's surface?"

2. Show *Volcano Eruptions* or *Volcanoes 101* video clips from the National Geographic Website.

3. Have students share new ideas with a partner, and add to their concept map anything that they learned from their partner.

4. Visit the Question Quilt – have any of the questions been answered? Attach answers below the associated question.

5. Read aloud *Volcanoes!* Focus students with the following questions which should be written and attached to the Question Quilt:
    - How do volcanoes change the Earth's surface?
    - What are some of the clues a volcanic eruption is about to occur?
    - What are some ways that scientists study volcanoes?
    - What do earthquakes, landslides and volcanoes have in common?

6. Have students turn back to their concept map and add any new information (highlight) about processes that change the Earth's surface.
    - Have students share new ideas with a partner, and add to their concept map anything that they learned from their partner.
7. Visit the Question Quilt – have any of the questions been answered? Attach answers below the associated question.

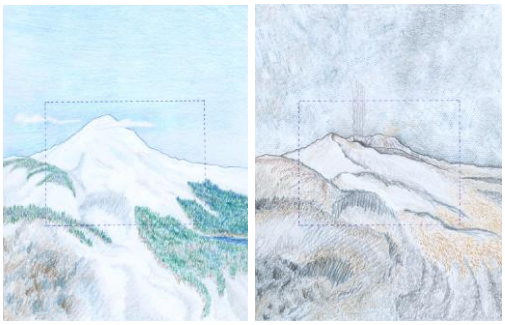
8. Directions for the *Volcano Inside/Outside-Before/After* Template.
    - Begin by demonstrating the Volcano Flipbook.
        - The volcano flipbook helps students to understand WHY the volcanic eruption happens. But the earth's surface is largely lost from view in flipbook.
        - The different colors, as seen in the flipbook, indicate the age and type of material making up the volcano.

    - Ask students to share what changes they noticed occurring on the inside and outside of the volcano.

    - Make copies of volcano Inside/Outside-Before/After Template and

distribute. Have students cut the page in half along the cut line.

TEACHER SAMPLES



- Ask students to glue or tape the side with the drawing into their notebook and fold the blank sheet over the top. (It is recommended that students place the images side-by-side, on a two page spread, in their science notebook.) Students should trace the outline of the mountain on the blank folded cover sheet.

- Expanding in any direction invites students to think about the impact of volcanic activity beyond the immediate vicinity. For example, this activity could open the door into learning about how the riparian zones of Spirit Lake and Toutle River were impacted by the eruption of Mt. St Helens.
    - Expanding side-to-side includes landscape
    - Expanding downward shows inside the earth
    - Expanding upward shows atmospheric impact

- Students can draw with pencil, then color with colored pencils as many details as they can on the outside of the volcano, including plants and animals. If time is limited, at least have students color the lava red on the inside of the volcano.

- Assessment Opportunity: while students are working on their drawings, the teacher should circulate to ask probing questions such as:
  - Can you tell me what is happening here?
  - What Earth changes are you illustrating here?
  - What have you drawn _____?
  - Why have you made the Earth's surface look differently in the two drawings?

This is a powerful application that allows students to process the images they have seen while studying volcanoes.

9. Ask the students to take a brief walkabout to view each other`s work. Discuss what they noticed about each other's drawings.

10. Have students turn back to their concept map and add any new information (highlight) about process that change the Earth's surface.

11. Visit the Question Quilt – have all of the questions been answered? Attach answers below the associated question.

1. Using the Post-Assessment Concept Map, ask students to write the three process that change the Earth's surface in the ovals provided. Students should write and/or draw as many details, facts and descriptions as they can think of about how each process changes the surface of the Earth. Note: if this set of lessons is done after the STC *Land and Water* or FOSS *Landform* Unit, consider having students add two additional ovals for weather and erosion. Their details should be linked to the correct process(es). (See Student Sample Concept Map).

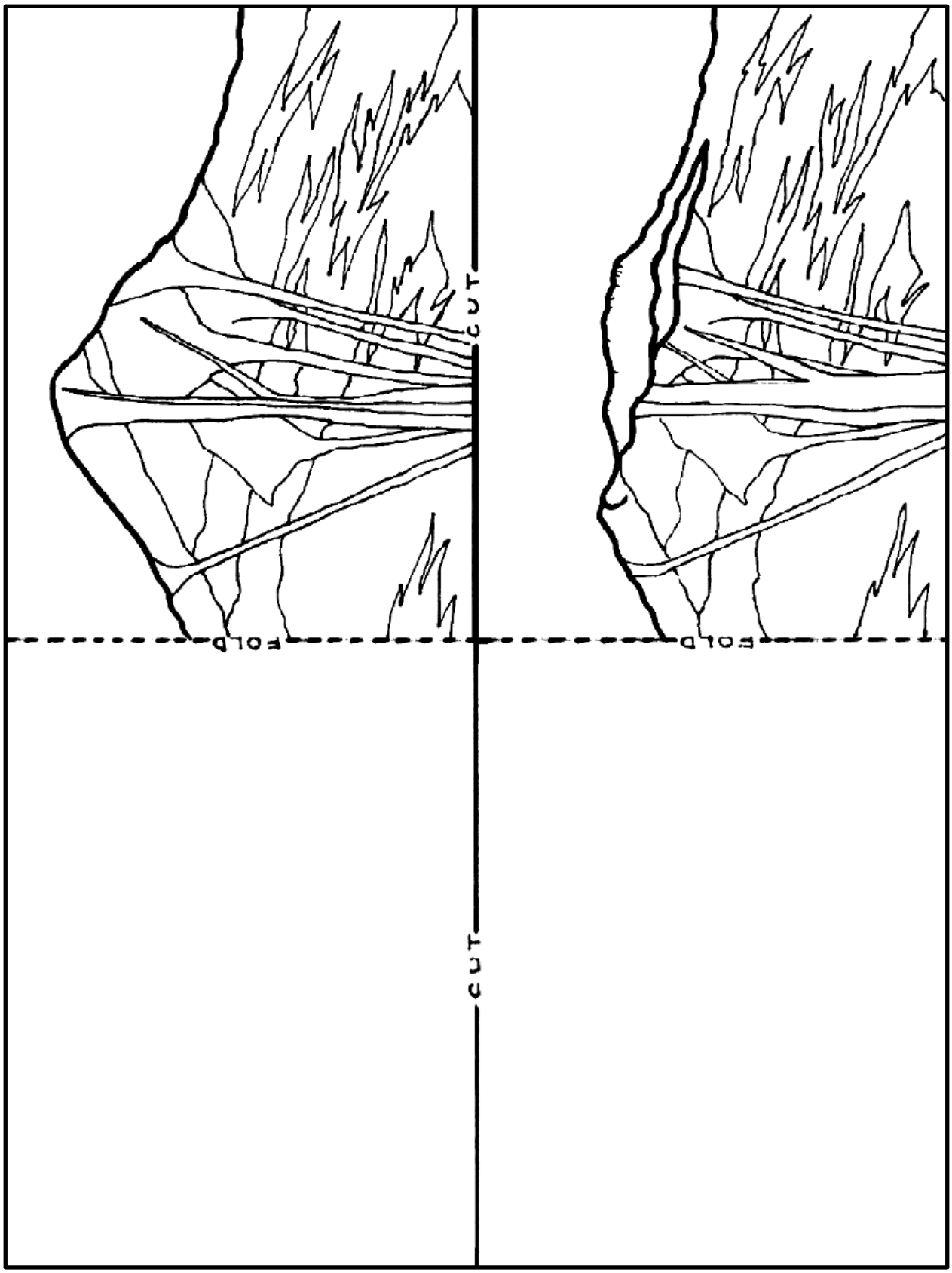
EVALUATION/ ASSESSMENT:

The concept map is intended to be used as an individual assessment; however some students may require additional support to complete this task.

During the assessment, teachers should observe and take note of any lingering misconceptions. These will be attended in to in Step 3.

2. Collect **Post-Assessment Concept Map**

3. To address any misconceptions, collect and discuss ideas on a class concept map. Guide the discussion to ensure that students understand processes that change the surface of the Earth.



Student Sample Concept Map