

Volcano: The Storyboard

Overview:

Volcano growth and erosion is a continuous process, which scientists often break into stages. In this activity, students create a storyboard of the stages of a volcano's life cycle.

A storyboard is one way to map out or organize a project. Storyboards, which are used in movie making and multimedia projects, look somewhat like panels in a cartoon strip. A good storyboard should provide an overview of a project. Students may use their storyboard to complete a multimedia project depicting the growth of a volcano.

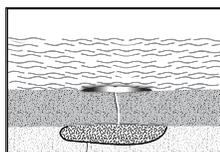
Objectives:

The student will:

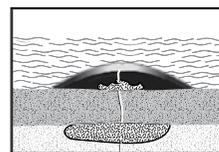
- put the stages of volcano growth and erosion in the correct order; and
- describe and illustrate each stage of volcano growth on a storyboard.

Answers to Student Worksheet:

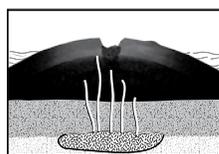
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|---|---|
| <ol style="list-style-type: none"> 1. see diagram below 2. a) on the edge 3. from the melting zone 4. d) growth is below sea level 5. see diagram below 6. b) directly over 7. a) via a magma chamber 8. c) calderas are formed 9. see diagram below 10. a) on the edge | <ol style="list-style-type: none"> 11. b) from the melting zone 12. b) cinder cones are formed 13. see diagram below 14. c) away from 15. b) from the melting zone 16. e) Pacific Plate magma begins to crystallize 17. see diagram below 18. c) away from 19. c) magma no longer surfaces 20. a) coral reef building rules |
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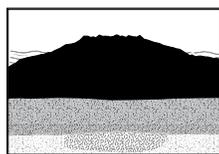
answer to question 1



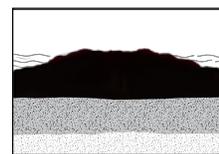
answer to question 5



answer to question 9



answer to question 13



answer to question 17

Volcano: The Storyboard

Materials:

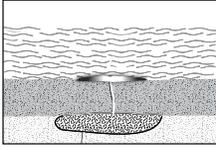
- Large paper (roll, butcher, poster)
- Colored pencils
- HyperStudio®, iMovie, PowerPoint or AppleWorks (optional)
- Transparency: “Volcano Growth Stages”
- Student Information Sheet: “Volcano Growth Stages”
- Student Worksheet: “Volcano Storyboard”

Activity Procedure:

1. Distribute the Student Information Sheet: “Volcano Growth Stages.” Display the Transparency: “Volcano Growth Stages” and discuss each stage.
2. Explain that a storyboard is one way to map out or organize a project. Distribute colored pencils and the Student Worksheet: “Volcano Storyboard.” Sketch a storyboard on large paper to model for students how to create a storyboard of volcano growth for themselves.
3. Ask students to draw a story-board illustrating the stages in volcano growth and erosion. In each step students should identify and describe the geologic process taking place and label their drawings.
4. Students with access to a computer lab with HyperStudio®, AppleWorks (slideshow), PowerPoint or iMovie can scan storyboards or recreate them electronically to create a multimedia presentation.
 - **HyperStudio®:** Ask students to build a HyperStudio® stack of the sequences they drew and described in their storyboard. Each card should have a picture and a description of the geological process taking place, along with navigation buttons to the next card in the stack.
 - **PowerPoint or AppleWorks** (slide show feature): Ask students to make a presentation that includes the sequences they drew and described in their storyboard. Each slide should include both images and text to describe the geologic process taking place.
 - **iMovie:** Ask students to put animations or still images together to make an iMovie, then add narration describing the clips in their movie.

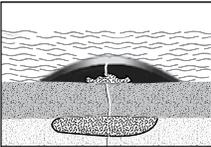
Extension Idea: Make a shield volcano animation book using sticky notes or small paper tablets.

Volcano Growth Stages



Stage 1: Submarine Stage

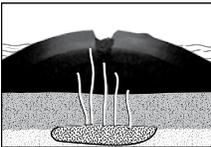
Volcano growth occurs below sea level at the outer edge of a hotspot, an area cooler than the area directly over a hotspot. Cool, sticky magma from the melting zone at the base of the Pacific Plate slowly builds a steep-sided volcano.



Stage 2: Shield-building Stage

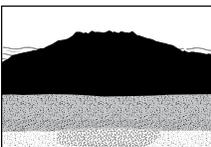
The volcano grows quickly, because it has moved directly over a hotspot. The hot, fluid magma flows out to form a short volcano with gently sloping sides in a shield shape.

In the shield-building stage, magma stops at a temporary storage area called a magma chamber on its way to the surface. Magma chambers feed eruptions. If a large eruption occurs during this stage, the magma chamber drains and its roof collapses to form a caldera.



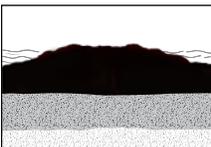
Stage 3: Capping Stage

The volcano has moved across the hotspot to the other side. Because the edge of the hotspot is cool, the magma rising to the surface is sticky. The magma chamber has cooled and crystallized and erupting lava flows now come from the melting zone at the base of the Pacific Plate. Short, small eruptions of magma from the melting zone occur to form cinder cones and lava flows that cap the surface of the volcano, creating a bumpy appearance.



Stage 4: Late Stage

As the volcano moves farther from the hotspot, volcano growth slows. The source of magma at the base of the Pacific Plate begins to crystallize, and new pathways are found for pasty magma to reach the surface.



Stage 5: Atoll Stage

The volcano has moved so far from the hotspot that magma no longer reaches the surface and growth stops. Over millions of years, the volcano surface above sea level erodes away leaving only a large ring-shaped atoll created by coral reefs that have been built up around its edges. Coral reefs, which are made up of the skeletons of billions of marine organisms, grow in the shallow ocean water along the coastline of a volcano. Coral reef-building rules during the atoll stage.

Volcano Storyboard

Directions: Using the Student Information Sheet: “Volcano Growth Stages” and the *Ola Ka Honua: Volcanoes Alive* interactive DVD, sketch, label and describe each stage of volcano growth and erosion.

<p>Submarine Stage 1. Draw volcano shape.</p> <div style="border: 1px solid black; height: 150px; width: 100%; margin: 10px 0;"></div> <p>2. Where is the volcano in relation to the hotspot? a) on the edge b) directly over c) away from</p> <p>3. How does magma reach the surface? a) via a magma chamber b) from the melting zone c) magma no longer surfaces</p> <p>4. Circle the feature unique to this stage. a) coral reef building rules b) cinder cones are formed c) calderas are formed d) growth is below sea level e) Pacific Plate magma begins to crystallize</p>	<p>Shield-building Stage 5. Draw volcano shape.</p> <div style="border: 1px solid black; height: 150px; width: 100%; margin: 10px 0;"></div> <p>6. Where is the volcano in relation to the hotspot? a) on the edge b) directly over c) away from</p> <p>7. How does magma reach the surface? a) via a magma chamber b) from the melting zone c) magma no longer surfaces</p> <p>8. Circle the feature unique to this stage. a) coral reef building rules b) cinder cones are formed c) calderas are formed d) growth is below sea level e) Pacific Plate magma begins to crystallize</p>	<p>Capping Stage 9. Draw volcano shape.</p> <div style="border: 1px solid black; height: 150px; width: 100%; margin: 10px 0;"></div> <p>10. Where is the volcano in relation to the hotspot? a) on the edge b) directly over c) away from</p> <p>11. How does magma reach the surface? a) via a magma chamber b) from the melting zone c) magma no longer surfaces</p> <p>12. Circle the feature unique to this stage. a) coral reef building rules b) cinder cones are formed c) calderas are formed d) growth is below sea level e) Pacific Plate magma begins to crystallize</p>
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Volcano Storyboard

<p>Late Stage 13. Draw volcano shape.</p> <div style="border: 1px solid black; height: 150px; width: 100%; margin: 10px 0;"></div> <p>14. Where is the volcano in relation to the hotspot? a) on the edge b) directly over c) away from</p> <p>15. How does magma reach the surface? a) via a magma chamber b) from the melting zone c) magma no longer surfaces</p> <p>16. Circle the feature unique to this stage. a) coral reef building rules b) cinder cones are formed c) calderas are formed d) growth is below sea level e) Pacific Plate magma begins to crystallize</p>	<p>Atoll Stage 17. Draw volcano shape.</p> <div style="border: 1px solid black; height: 150px; width: 100%; margin: 10px 0;"></div> <p>18. Where is the volcano in relation to the hotspot? a) on the edge b) directly over c) away from</p> <p>19. How does magma reach the surface? a) via a magma chamber b) from the melting zone c) magma no longer surfaces</p> <p>20. Circle the feature unique to this stage. a) coral reef building rules b) cinder cones are formed c) calderas are formed d) growth is below sea level e) Pacific Plate magma begins to crystallize</p>
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