

**“Volcano Folklore vs. Reality”**  
**Exploring the structure of the Earth through stories and science**

*Tia D. Larese*  
*Penn Alexander School*

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**Overview:** When faced with the ever-growing pressure of meeting common core standards in literacy and math, how can teachers introduce more science in early education? The answer: integration. Using a high-interest topic, such as volcanoes, teachers can not only capture their students’ attention, but they can teach required skills across content areas to meet the needs of local, state, and national standards. This unit will look at geology from different perspectives, teaching skills of reading comprehension, making connections, and informational writing while providing lessons and activities to encourage future volcanologists to explore the world and the changes that occur every day.

**Rationale**

There is a heavy emphasis in K-3 grades to develop a student’s reading and writing ability before they end 3<sup>rd</sup> grade. Students get at least 120 minutes of independent reading, writing, vocabulary, grammar, and spelling instruction daily, on average. In addition, students are also constantly being asked to develop their ability to read, write, and respond to texts in other subject areas, such as social studies, math and science, that it does not always leave teachers the opportunity to have student-led or hands-on learning in the classroom. As a result, there is a need for teachers to be intentional in making time to explore and exposing their students to the scientific method, experiments, and projects, while also meeting the curriculum needs of teaching reading and writing.

**Objectives**

This unit is intended for students in Grade 3 & 4. They spend most of the day in a self-contained classroom except for a 45-minutes specialist class each day, in addition to a 30-minutes lunch, and a 15-minute recess. Students take a Science class twice a week and

work on three large units of study over the course of the year with that teacher, in addition to Art, Music, Gym, and Technology.

The objectives of the unit will include the following:

- Explain how volcanoes form and change over time,
- Identify key figures in folktales and how people in the past used stories to explain the existence of volcanoes,
- Understand the rock cycle, parts of a volcano, and the different types of eruptions,
- Encourage students to study different rocks and minerals that are formed from a volcano,
- Establish the history of plate tectonics, and study volcanic events in Earth's history, including learning about the Ring of Fire.

## **Background**

As part of the Teachers Institute of Philadelphia (TIP), in the spring semester of 2017, I had the opportunity to take the class “What is the Earth made of?” with Reto Grieré, Department Chair & Professor of Earth & Environmental Sciences at the University of Pennsylvania. Throughout the course, some of the topics we discussed were inorganic chemistry, chemical bonding, mineralogy, rocks, plate tectonics, mountain building, and weathering/erosion. In addition to an immense amount of content knowledge being transferred, I began to look at the Earth differently. Through each subject we encountered, I found myself analyzing the building blocks of the Earth from multiple lenses, unlocking mysteries, explaining phenomenon, and garnering a better understanding of how structures, well beyond the naked eye, are impacting our way of life and our understanding of the world we live in.

The complexity of inorganic chemistry and bonding is intimidating when looked at alone; however, when approached with the lens of finding patterns in our world, it's an exciting topic for an adult, and probably even more so for a student. To truly begin understanding our Earth, one must delve into observing the building blocks of what composes the Earth. Elements, the smallest component we can distinguish, is made up of electrons, protons, and neutrons. Dmitri Ivanovich Mendeleev (1869) was the scientist who actually proposed the Periodic Table, whereby organizing elements in groups and columns based on their properties. Amazingly, he even predicted the existence of unknown elements using this pattern. The configurations, or the geometry of the orbitals and how they are arranged, will ultimately define how elements join together to form minerals. To a student, it is vital to understand that much of what seems random in nature is actually systematic and predictable.

Niels Bohr's (1913) model helped to predict electronic configurations that were both systematic and periodic. In fact, the most stable form elements strive to become would

be a noble gas structure, due to the least amount of energy exerted. However, we find many non-gas structures in our world, which imply that elements, much like people, come together to find stability. The three types of bonds in our world (Ionic, Covalent, Metallic) exhibit equilibrium, a balance of atoms both attracting and repulsing one another. Nobel Prize Winner Linus Pauling developed five rules for why atoms arrange themselves this way. This repetition in nature results in a beautiful, geometric pattern that exists on the smallest level. Students would be truly amazed to see repetition in the configurations and what composes our world, ultimately to recognize similar patterns in other areas.

Rocks and minerals can be beautiful and tangible for students; however, when approached with the lens of using rocks to discover information about history or how those minerals were formed, it can be powerful. Minerals are one of the key areas Earth Scientists study. When a child looks at a gemstone, they may initially notice its luster or vibrant colors. As an educator, I would want to share with my students the idea that every mineral is ultimately a crystal made of elements that grows over time, in different ways, reflecting the environmental conditions it was faced with. For example, heating or radiation can alter the color of gems. Crystals can also grow with “inclusions,” such as other solid minerals, liquids, and gases, which can tell you where it may have grown. Not only that, the luminescence of a mineral can actually help to date its age (i.e. pottery), while the magnetism of a rock or mineral can actually infer at which direction Earth’s magnetic north was pointing during formation. The electrical properties of a mineral and understanding whether or not it is a good conductor or insulator, also has implications for students to understand how we use minerals in our everyday lives. Through the study of rocks and minerals, students can make connections to the real world, by delving into history and everyday life.

The movement and changes of the Earth over time, whether it be the topic of plate tectonics, mountain building, volcanic eruptions, or weathering, are sensational topics that garner children’s attention. However when approached with the lens of studying its impact on humans and animals today and in the past, it can be truly enlightening. It seems improbable at first that the liquid outer core under the surface of the Earth has any impact on my way of life. When I learn that migrating animals rely on its magnetism, or the fact that it deflects solar winds and radiation rays from the surface, or even the Northern Lights are a result of the magnetism created by it, I have to realize that even if I can’t see the impact, its there and it is significant.

Our Earth was formed by a collision of objects in the sky. This energy transfer still results in 50% of the heat that our Earth holds, while the other 50% results from radioactivity for the surface. Today, many people even want to harness that geothermal heat to use for energy. It is also that heat flow that causes the continents to move. Through studying rocks and minerals, scientists have been able to develop their understanding of how the Earth looked millions of years ago. Pangea, or the formation of

a super-continent, is evidenced from mountains in both the United States and Africa, the magnetism in rocks, glacier erosion, and even fracture zones that exists on two continents. Today, the continents we live on and the plates beneath them continue to move and each plate boundary (divergent, convergent, transform), the movement causes convections on a global scale.

Earthquakes and volcanoes depict a more-than-visible way that the Earth impacts people's way of life, that is especially tangible for children in grades K-4. Whether a volcano is explosive or effusive, they transform the landscape around them and impact the people living there. For instance, the Hawaiian Islands, which over one million people call home, was formed from a "hot spot" in the Pacific plate. Yet, the fertile land is ripe for lush rainforests that have become a mecca for tourists. It is poignant for students to see some of the positive effects a volcano may have on the environment. Meanwhile, the explosion of E-15 in Iceland prevented air travel around Europe, costing the airline industry close to two billion dollars of lost revenue. For a child, it is important to see beyond the explosion, but rather the impact a volcano may have over time. In modern times, we can easily "google" information about volcanoes and understand the science behind them; however, we see throughout history that people developed stories to explain the sensational and devastating experiences with volcanoes. This idea was what prompted my desire to couple the study of science with literature, as a way for students to understand the impact of nature on the lives of people today and throughout time.

The class inspired me to reveal the dichotomy of science and folklore with a common vessel. By teaching about one topic through different lenses, it would help my students practice seeing the world from different perspectives, grounding their knowledge in real life, yet using the authentic excitement of nature to fuel their creative writing.

To prepare myself for writing this unit, I researched the history of volcano folklore, identifying key folktales in history across different cultures around the world. For each famous folktale, I had to research facts and information about the formation of the volcano. I developed some child-friendly stories to introduce the concepts of volcano folklore for my students and give a time frame or point of reference for students to compare and contrast different volcano formations around the world. To begin, I looked at more recent or famous eruptions that the students may be familiar with (i.e. Iceland, Pompeii).

In addition to the research of Volcano folklore, I further investigated the importance of teaching plate tectonics, the Ring of Fire, geology, and Earth dynamics. I focused on the guidelines of Science education and began developing key concepts to address when teaching my class about these topics.

## **Standards**

The Core Curriculum of the School District of Philadelphia is aligned to the Pennsylvania Academic Standards for Science Education, as well as English Language Arts Standards. These standards include instruction on the following topics: Writing with different purposes, researching and reading for information, understanding different points of view, as well finding the relationships between the Earth and people. Students will focus on reading fictional and informational texts, preparing stories to teach about volcanoes, and exploring geology and volcanology.

**CCSS.ELA-LITERACY.RI.3.1**

Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

**CCSS.ELA-LITERACY.RI.3.10**

By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2-3 text complexity band independently and proficiently.

**CCSS.ELA-LITERACY.RI.3.3**

Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

## **Strategies**

This unit will include age-appropriate activities to develop literacy skills and engage students in hands-on discovery.

- *Whole Group Direct Instruction* – The teacher will be at the front of the classroom explaining to students via a SMART board/ chalkboard / whiteboard.
- *Small Group Instruction* – For students struggling with key concepts, the teacher will meet with them in small groups to review concepts and to differentiate learning.
- *Shared & Independent Work* – Students will have the opportunity to complete tasks working with partners, small groups, and independently.
- *Graphic Organizers* – Teacher-made worksheets using visual representations will help students organize their thinking.
- *Hands-on Exploring*– Students will be engaged in activities that allow them to access and explore rocks, other Earth materials, and make models of scientific theories.
- *Think, pair, share* – Students will have the opportunity to share their thoughts and ideas with partners and with the whole class.
- *Group Centers* – There will be opportunities for students to rotate through centers to further explore scientific concepts.
- *Questioning* – An ample opportunity for group discussion will help facilitate student understanding. Using Bloom’s Taxonomy, teachers can craft key

questions to help expand students' thinking. These questions are crucial to monitor student understanding both in formative and summative assessments:

- Level 1 (Knowledge)
  - What is \_\_\_\_\_?
  - How did \_\_\_\_\_ happen?
  - Match the word with the definition.
- Level 2 (Comprehension)
  - Can you explain what is happening?
  - Compare or contrast \_\_\_\_\_
  - Draw a picture and include labels that show how this event happened or describe this object (volcano).
- Level 3 (Application)
  - How would you solve \_\_\_\_\_ using what you've learned?
  - What would happen if \_\_\_\_\_?
  - What might have happened if this \_\_\_\_\_?
- Level 4 (Analysis)
  - What is the relationship between \_\_\_\_\_ & \_\_\_\_\_?
  - What is the function of \_\_\_\_\_
  - Examine how the different events or people work together.
- Level 5 (Synthesis)
  - What changes would you make to \_\_\_\_\_?
  - How would you adapt \_\_\_\_\_ to create a different \_\_\_\_\_?
- Level 6 (Evaluation)
  - What would you recommend \_\_\_\_\_?
  - Was it better that \_\_\_\_\_?
  - Judge the importance of volcanology or the study of folklore.

### **Activities:**

#### **1. Building Background Knowledge**

*Objective:* Students will be able to identify the key details of different genres of folklore in order compare and contrast different genres of literature, as well as compare and contrast narrative elements.

*Overview:* Students will work together in groups to read and analyze folklore about volcanoes from different countries around the world. They will compare and contrast each country, legend, and reality using a T-chart. Then, teacher will review answers and explicitly teach facts and information to volcanoes.

*Materials:* Read Aloud, "Pele and the Rivers of Fire"

Graphic Organizers

Class KWL Chart

Class T-charts

Oregon State University Volcano Folklore Fact Sheets (See Appendix)

*Hook:* Watch video clip of Hawaiian eruptions & answer the question “What do we know and notice about Volcanoes” written on the whiteboard

*Task: Day 1:* The teacher will write the guiding question: How does folklore go? Students will brainstorm with partners what they know about myths, fables, and legends. The class will generate a list of typical patterns that they see in the genre of stories so they can watch out for them during the read aloud. The teacher will then read aloud the story “Pele and the Rivers of Fire.” Students will follow along and check for the elements of folklore that they notice.

*Day 2:* Students will work with partners or small groups to read a different story about volcano folklore from different places in the world. Each group will complete a graphic organizer that asks them questions about the elements of a folktale, but also prompts them to discuss what they know about volcanoes.

*Review:* The whole class will review the completed graphic organizers about narrative elements of a folktale.

*For Next Time:* The class will develop a K-W-L chart with what they already know about the topic, what they want to learn about the topic, and later in the unit, what they have learned about the unit.

<u>Know About Volcanoes</u>	<u>Want to Know About Volcanoes</u>	<u>Learned About Volcanoes</u>
<u>Know About Myths</u>	<u>Want to Know About Myths</u>	<u>Learned About Myths</u>

## **2. Volcano Spotlight**

*Objective:* To explain how volcanoes form and change over time, and to identify key figures in folktales and how people in the past used stories to explain the existence of volcanoes.

*Overview:* Students will read about important historical eruptions around the world. Students will work with partners to read about a specific type of volcano and eruptions and will share out with the class key facts and ideas.

*Materials:* Google maps (pre-made locations)  
Eruption Kits – rocks, maps, history fact sheet, timeline, primary documents  
Diet coke & mentos candy  
Baking soda & vinegar  
Different types of volcanic rock to compare & contrast

Hook: Teacher will model an eruption for the class using different materials.

Task: Small groups will be assigned an eruption kit. In each kit, there will be a variety of documents and materials that are featured from different major eruptions in history. For example, there will be rocks that represent the type of rocks formed after the eruption, photographs of before and after, a timeline of the events, photographs or paintings, a fact-sheet, and a map of the area. Students will fill out a graphic organizer of what they learned from each type of source of information.

<b>Good Readers Can Read More Than Just Books</b>		
<b>Item</b>	<b>What I Notice</b>	<b>What I Think (Infer)</b>
Rocks		
Map		
Timeline		
Images		
Fact Sheet		

Review:

<b><u>EXIT TICKET</u></b>
<b>3 FACTS YOU HAVE LEARNED</b>
_____
_____
_____
<b>2 QUESTIONS YOU STILL HAVE</b>
_____
_____
<b>1 TOPIC YOU WANT TO LEARN MORE ABOUT</b>
_____

For Next Time:



Teacher will review the exit ticket and compile a list of questions that students have based on the lesson.

### 3. Research

Objective: understand the rock cycle, parts of a volcano, and the different types of eruptions, to encourage students to study different rocks and minerals that are formed from a volcano, to establish the history of plate tectonics, and study volcanic events in Earth's history, including learning about the Ring of Fire.

Overview: Students will choose a volcano that exists today that is interesting to them. From there, they will have the opportunity to turn the information about that specific volcano into their own volcano folktale. Teacher will model research techniques and offer writing lessons to help students focus their writing.

Materials:     *Graphic Organizer*  
                      *Small Earth-shaped ball*  
                      *Flip-book graphic organizers*  
                      *-Earth & Plate Tectonics*  
                      *-Types of Volcanoes*  
                      *-The Rock Cycle*

Hook: *Discovery Kids Virtual Volcano*

Task: After students have learned about different types of eruptions, they will cycle through centers to create Earth & Volcano flip-books and complete graphic organizers to compare and contrast the different types of volcanoes and learn about the Earth's structure. They will keep a folder of facts and information to use to develop their own folktale.

#### TYPES OF VOLCANOES

TYPE	CHARACTERISTICS	EXAMPLES	DIAGRAM
SHIELD VOLCANO			
STRATOVOLCANO			
CINDER CONES			

LAVA DOMES			

Create a “flipbook” by creating different layered papers. On each sheet, you can describe the different layer of the Earth with facts and diagrams. Students can refer to it when talking about the Earth in their own research.

**LAYERS OF THE EARTH**

<p><b>LAYERS OF THE EARTH</b> By: _____</p>				

*Review:* Students will write down on a post-it one fact or piece of information that they learned or found interesting. Then, as a group of 4, each person will bring their post-it and take turns sharing out with the group. The other members of the group have the opportunity to comment or ask questions before moving on to the next post-it.

<p><b>STUDENT 1</b> <b>POST-IT</b></p>		<p><b>STUDENT 2</b> <b>POST-IT</b></p>
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	<b>PLAY THE POST-IT</b>	
<b>STUDENT 3  POST-IT</b>		<b>STUDENT 4  POST-IT</b>

For Next Time:

#### 4. Writer's Workshop

Objective: To identify key figures in folktales and how people in the past used stories to explain the existence of volcanoes, and to understand the rock cycle, parts of a volcano, and the different types of eruptions.

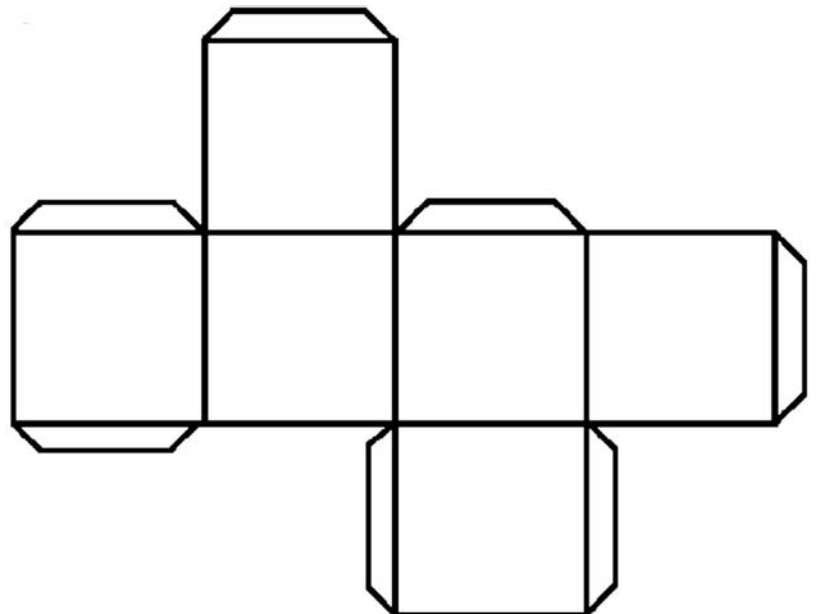
Overview: Students will gather information and craft a presentation about their selected volcano to share with families.

Materials: *Graphic Organizer - Prewriting*  
*Folktale Story Elements Dice*

Hook: "Pass the Earth" Using an Earth-shaped ball, students will pass it around the classroom to create a story about volcanoes. Every time a student has the ball, they add another line to the story verbally. This story generator will help students brainstorm their own version of a tale. The teacher will model how to use the story element dice game to get ideas for their folktale.

Task: Using a graphic organizer and story elements dice, students will generate ideas for a folktale that includes factual information about volcanoes. Print out a blank story elements cube and fill out suggested characters, settings, and plot events.

*For example:*



**Character Cube:** Gods, Goddesses, Spirits, Animals, Nature, Chiefs, Demi-gods, etc.

**Setting Cube:** Iceland, Japan, Mexico, Italy, Greece, United States, etc.

**Plot Cube:** Someone is tricked, Your character gets upset, There is a challenge, There is an argument, Something is wrong in nature, etc.

They will then fill out the graphic organizer and begin drafting their stories with the support of a writing partner and the teacher. Students will be encouraged to go back and reread other folktales and volcano books as mentor texts for their own story.

### PRE-WRITING GRAPHIC ORGANIZER

CHARACTERS	SETTING	PLOT OR OBSTACLE	STORY STARTER
<i>PROTAGONIST:</i>  <i>ANTAGONIST:</i>	<i>WHERE:</i>  <i>WHEN:</i>		
SENSORY DETAILS	BEGINNING	MIDDLE	END

*Review:* Students will share out one thing that they are proud of accomplishing that day.

*For Next Time:* Students will continue to independently write, edit, and publish their work throughout writing and hodge podge.

### 5. Writers' Celebration & Performance

*Objective:* To identify key figures in folktales and how people in the past used stories to explain the existence of volcanoes, and to understand the rock cycle, parts of a volcano, and the different types of eruptions.

*Overview:* Students will publish and present their stories with our school community.

Materials: Student dioramas

Student stories

Project Description & Rubric for Assessment (See Appendix)

Hook: We will begin with an opening from all students and welcome parents and families to our school.

Task: Each student will have the opportunity to design a diorama of the setting of the folktale. They should design a working model volcano that resembles to the structure of the volcano in their story, also taking into account the country of origin's landscape, and details. They should also create puppets to represent the characters in their folktale and any props that are mentioned throughout the story. Each child will work on the diorama at home and present it along with the story for family members. They will have the opportunity to let their volcano erupt. This will be the culminating project grade for the unit.

**Bibliography:**

**Reading List:**

Buckland, Paul C., Dugmore, Andrew J., and Kevin J. Edwards. "Bronze Age Myths? Volcanic activity and human response in the Mediterranean and North Atlantic regions." *Antiquity*, 1997.

\*This article seeks to answer the questions of the influence of volcanic activity on people living near them.

Folklore. "Hawaiian Legends of Volcanoes." 1917.

\*A collection of stories about Pele, other gods, and the people of Hawaii.

Nimmo, H. Arlo. "Pele, Volcano Goddess of Hawai'i: A History." 2011.

\*A history about Pele and her influence on the culture and landscape of the Hawaiian islands.

Westervelt, W.D. "Hawaiian Legends of Volcanoes: Collected & Translated from The Hawaiian." 2011.

\*A collection of folktales from Hawaii.

Zellinga De Boer, and Donald Theodore Sanders. "Volcanoes of Human History: The Far-Reaching Effects of Major Eruptions."

\*Volcanoes are powerful landforms and this text seeks to explain how far their influence reaches.

**Teacher Resources:**

Friedrich, Walter L. "Fire in the Sea: The Santorini Volcano: Natural History and the Legend of Atlantis." 2000.

\*A great influence behind the idea of my integrated unit combining legend with science.

Geoscience News & Education. <http://geology.com/teacher/volcano.shtml>

\* This is a great resource for volcano facts and additional activities for the classroom.

“History in the Headlines: Volcanoes.” <http://www.history.com/news/category/volcanoes>

\*An interesting collection of news articles about volcano findings.

Lauber, Patricia. “Volcano: The Eruption and Healing of Mount St. Helens.” 1993.

\*A beautiful photographic journey of Mount St. Helens from its eruption to its revival many years later.

Oregon State University. “Volcano Folklore.” <http://volcano.oregonstate.edu/volcano-folklore>

\*An inspirational site with a tremendous amount of research about volcanoes, but also the folklore and stories that surround them. Many of the stories were derived from the list and I encourage teachers to read about other volcanoes around the world.

Osborne, Mary Pope. “Ancient Rome and Pompeii: A Nonfiction Companion to Magic Tree House #13.” 2006.

\*The author does a wonderful job writing paired fiction and non-fiction texts to entertain young readers but also educate.

Scholastic. <https://www.scholastic.com/teachers/collections/teaching-content/volcanoes/>

\*An interactive site with songs and videos to help supplement learning about the Earth and geological terms.

Schreiber, Anne. “Volcanoes! (National Geographic Readers). 2008.

\*This has been a mentor informational text in my classroom for many years because of the way it creatively writes about the topic of volcanoes. I encourage it to help students gain background knowledge but also learn some cool facts.

Wikipedia. “Volcano Folklore.” 2017

\*A number of Wikipedia articles highlight the folklore around the world explaining volcanic activity in their region.

### **Student Resources:**

Argueta, Manlio, and Elly Simmons. “Magic Dogs of the Volcanoes.” 1997.

\*This is a traditional Salvadorean legend presented in Spanish and English.

Davis, Edith. “Pompeii... Buried Alive!” 1987.

\*Third graders love learning about Pompeii and this text does a great job of explaining some of the details.

Discovery Kids Volcano Explorer. <http://discoverykids.com/games/volcano-explorer/>

\*An interactive website that helps students understand the different compositions of volcanoes.

Furgang, Kathy. “National Geographic Kids Everything Volcanoes and Earthquakes: Earthshaking photos, facts, and fun!” 2013.

\*A general fact book about volcanoes and the Earth.

Herman, Gail. “The Magic School Bus Blows Its Top: A Book About Volcanoes.” 1996.

\*A text that helps weave fiction with non-fiction. The narrative form helps students to digest the loads of factual information they learn about volcanoes.

National Geographic Kids. <http://kids.nationalgeographic.com/explore/science/volcano/>

\*Pictures, facts, and footage of volcanoes around the world.

Nordenstrom, Michael. “Pele and the Rivers of Fire.” 2002.

\*Interesting read aloud and mentor text to introduce folktales.

Rusch, Elizabeth. “Will it Blow? Become a Volcano Detective at Mount St. Helens.” 2017.

\*A text that helps students think like scientists, looking for signs of when a volcano may erupt.

Tonatiuh, Duncan. “The Princess and the Warrior: A Tale of Two Volcanoes.” 2016.

\*A mentor text that shares a Mexican legend about two volcanoes.

Van Rose, Susanna. “DK Eyewitness Books: Volcano & Earthquake.” 2014.

\*Factual and highly visual text for all learners to supplement their understanding.

### **Appendix:**

1. **Volcano Diorama & Folktale Project Description:** This is an overview of the final project of the unit and includes key components.
2. **Volcano Project Rubric:** This is one way that the project could be assessed.
3. **Teacher worksheet - Folktale vs. Facts: Italy**
4. **Teacher worksheet - Folktale vs. Facts: Indonesia**
5. **Teacher worksheet - Folktale vs. Facts: Pacific-Northwest**
6. **Teacher worksheet - Folktale vs. Facts: Iceland**
7. **Teacher worksheet - Folktale vs. Facts: Hawaii**

## Volcano Diorama & Folktale

**Due Date:** \_\_\_\_\_

*Project Description:* You will be learning about a volcano. Using this information, you will build a diorama of your volcano and use it to inspire your folktale

### **Volcano Diorama:**

1. Construct a model of volcano including any defining features of the volcano including craters and lakes.
2. Find out what currently exists or what did exist around your volcano (be it a city, forest, etc.) and include that in the diorama.  
- Possible materials may include clay, Styrofoam, paint, plaster, paper, etc.
3. Attach a picture of the volcano to your model.
4. Attach a note card to your volcano following the model below:

**Name of Volcano:**

**Elevation (Height):**

**Age of Volcano:**

**Country:**

**Date of Last Eruption:**

**Nearest City:**

**Type of Volcano: (Cinder Cone, Stratovolcano, Shield Volcano, Caldera, etc)**

**Three Interesting Facts: (complete sentences)**

1.

2.

3.



## Volcano Project Rubric

### \_\_\_\_\_ (40) Volcano Model

- \_\_\_\_\_ (10) Modeled after volcano
- \_\_\_\_\_ (5) Includes picture
- \_\_\_\_\_ (10) Featured surrounding area
- \_\_\_\_\_ (10) Creativity
- \_\_\_\_\_ (5) Neatness

### \_\_\_\_\_ (20) Note Card

- \_\_\_\_\_ (10) Name of Volcano, Elevation, Age,  
Date of Eruption, Country, City, Type of Volcano
- \_\_\_\_\_ (9) Three interesting facts
- \_\_\_\_\_ (1) Name

### \_\_\_\_\_ (40) Folk Tale

- \_\_\_\_\_ (5) Interesting characters
- \_\_\_\_\_ (5) Well-described setting based off volcano research
- \_\_\_\_\_ (10) The eruption is explained by a conflict in the story
- \_\_\_\_\_ (10) Includes a beginning middle and end
- \_\_\_\_\_ (10) Good use of vocabulary and mechanics

### \_\_\_\_\_ (100) Total

## ITALY

(Photo Credit: Tia Larese)

### **VOLCANO FOLKLORE: Stromboli**

(From: Oregon State University: Volcano World & Wikipedia)

A long time ago, people believed that the gods lived high upon the mountain tops and their emotions could be seen through the weather and natural events.

There were many Roman gods who were also believed to have resided in a chain of islands known as Aeolian archipelago. Aeolus, the god of the winds, would hide them in the caves and let them out of the caves as he needed them. This would cause spurts of fire to erupt from Stromboli like fireworks. Homer, in his tale "The Odyssey" mentioned that he met Aeolus on his journey home.

The Roman god of fire, Vulcan, also found his home in the Aeolian Islands. He was known to have his forge there, with his hammers causing the ground to rumble and fire to spark. His name ultimately became the root for our modern word "Volcano" to represent a mountain for fire.

*Note: Today, Stromboli is an active volcano, erupting as often as every 10-15 minutes. It is infamous for its "Strombolian Eruption" which is short, bursts of lava. It is known as the "Lighthouse of the Mediterranean" as its eruptions can be seen like fireworks from far away at night.*



(Photo Credit: Tia Larese)

### **VOLCANO FEATURE: Mount Vesuvius**

(From: USGS & Wikipedia)

**VOLCANO TYPE:** Stratovolcano

**LOCATION:** Naples, Italy

**MAJOR ERUPTION:** In August 79 AD, after weeks of earthquakes, Mount Vesuvius violently erupted. The local towns of Herculaneum and Pompeii were destroyed. Pompeii, while further away from the base of the mountain, was blanketed in ash, preserving the molds of people trying to escape.

**SIZE:** 4,203 feet

**ROCK:** Obsidian is a black, shiny and glass-like rock that is formed when magma erupts and cools quickly. Many ancient peoples used obsidian for weapons and tools.



### **DID YOU KNOW?**

The Roman Navy set out to try and save the people of Pompeii, under the command of Pliny the Elder. It is not known whether or not they were able to get close enough to save anyone.

## INDONESIA

### **VOLCANO FOLKLORE: TENGER CRATER**

(From: Oregon State University: Volcano World)



A long time ago there lived the King. He wanted nothing more than to have a child and soon his wife had a beautiful baby girl.

Word spread throughout the land of her beauty and one day, as she walked through a rice paddy an ogre saw her and fell in love with her. He went to the king and asked for her hand in marriage. The king did not want to upset the menacing ogre so instead of saying no, he challenged him to dig out a trench with just a half of a coconut shell in one night. The king believed this would be impossible, but he underestimated how much the ogre was mesmerized by his daughter's beauty and so the ogre agreed and began his work.

The ogre worked hard without stopping once for food or water through the night. As dawn was approaching, however, the king realized that the ogre may actually complete the task and decided to trick him. He awoke the town and his servants early to begin their jobs of pounding rice. At the sound of the villagers working, the roosters became confused and started to crow believing that it was already morning. When the ogre heard this, he believed that he had lost the competition and so he threw the coconut away and left with exhaustion.

The trench the ogre dug became a sea of sand, while the coconut is now the famous volcano Mount Batok. Fun Facts: *The Tengger Crater is actually home to five volcanoes, while the island chain of Indonesia is home to over 130 active volcanoes, including Krakatoa, which had one of the most famous eruptions in modern history.*

### **VOLCANO FEATURE: KRAKATOA**

(From: *The Krakatau Eruption* By Peter Benoit)

(Photo Credit: OSU Volcano World)

**VOLCANO TYPE:** Stratovolcano

**LOCATION:** *Island in Indonesia*

**MAJOR ERUPTION:** A series of eruptions occurred by August 1883, but the most violent explosion took place on August 27<sup>th</sup> destroying towns and causing massive tsunamis that killed more than 35,000 people.

**SIZE:** Three cones made up the island of Krakatau. Rakata (2,667 feet), Danan (1,460 feet), and Perboewatan (400 feet).

**ROCK:** *Pumice* plummeted from the sky during the eruption. This volcanic rock is full of holes and very lightweight.

**DID YOU KNOW?** The volcanic dust that lingered in the atmosphere from this eruption caused dramatically vibrant sunsets, as we can tell from the poets and painters of the time period.



## UNITED STATES (PACIFIC-NORTHWEST)

### **VOLCANO FOLKLORE: Mount Manama & Mount Shasta**

*(From: Oregon State University: Volcano World & Wikipedia)*

A long time ago there were two Native American chiefs.

Under Mount Manama lived the spirit Llao, the ruler of the underworld. A hundred miles away on Mount Shasta, lived Skell, ruler of the sky.

One day, Llao emerged from the underworld and saw the beautiful daughter of a local Klamath chief. She wanted nothing to do with him and the underworld. Llao became angry and retaliated, causing fire to rain down on the tribe.

The people went to Skell for help and so a battle began between the two spirits. They began to throw rocks and flames at each other. Skell fought hard to save the Klamath people and eventually banished Llao in the underworld. He then covered the hole to the underworld and filled it with water, which created a giant lake.

*Note: Today, Crater Lake in Oregon is a stunning caldera lake that also serves as a National Park. These volcanoes are part of the larger "Ring of Fire" that surrounds the basin of the Pacific Ocean. Many volcanoes and earthquakes occur here due to plate tectonics.*

*(Photo Credit: USGS)*

### **VOLCANO FEATURE: Mount Saint Helens**

*(From: USGS & Wikipedia)*

**VOLCANO TYPE:** Stratovolcano

**LOCATION:** Washington State, U.S.

**MAJOR ERUPTION:** Mount Saint Helens is one of the most active volcanoes in the Pacific-Northwest region. Its most recent, major eruption took place in 1980. Over \$1 billion in property damage occurred and about 57 people died, many of whom were photographers, scientists, and locals.

**SIZE:** 8,330 feet

**ROCK:** Basalt is a bluish-gray volcanic rock that is common in the South American Andes Mountains.

**DID YOU KNOW?** The eruption of Mount Saint Helens was one of the largest eruptions in the contiguous 48 states.



*(Photo Credit: www.nps.gov)*



# ICELAND



## **VOLCANO FOLKLORE: HEKLA**

*(From: Oregon State University: Volcano World)*

A long time ago there lived a magician. He was a man consumed with power and he often tried to take different lands and put them under his spell. Word spread throughout the land of an island known as Iceland, with richly beautiful waterfalls, glaciers, black sand beaches, and lush green meadows. The magician wanted this land for himself, so he developed a plan to sneak onto the island.

The magician transformed himself into a whale so he could swim to the island unnoticed. He began his journey towards the island of Iceland. However, as he reached its rocky shore, he saw fireballs shooting into the sky towards him. He was frightened, believing that the fire balls were actually the spirits of the island. He believed that they would protect their land. So, the magician decided that he did not stand a chance, so he left, never to return.

Little did the magician know, but the fire he saw in the sky was from the eruption of the volcano Hekla.

*Fun Facts: Mt. Hekla is one of the most active volcanoes in Iceland, having erupted over 160 times in the past 1,000 years. Today, it is a popular tourist attraction.*

*(Photo Credit: Tia Larese)*

## **VOLCANO FEATURE:**

### **EYJAFJALLAJÖKULL (E-15)**

*(From: USGS)*

**VOLCANO TYPE:** Stratovolcano

**LOCATION:** *Iceland*

**MAJOR ERUPTION:** In 2010, the volcano, known commonly as E-15, erupted. The ash particles in the air blanketed most of Europe. It was too dangerous for airplanes to flight and, as a result, nearly 100,000 flights were canceled.

**SIZE:** 5,614 feet tall and covered by a glacier that is 62 miles wide

**ROCK:** *Basalt* is a rock formed when magma cools quickly, especially from water. In Iceland there are “lava fields” of hardened basalt that cooled quickly after eruptions.

**DID YOU KNOW?** Eyjafjallajökull has a close neighbor... the volcano Katla. In the past, the eruption of Eyjafjallajökull would actually predict that Katla would soon be erupting. Icelandic residents have evacuation plans in case it happens any time soon.



## UNITED STATES (HAWAII)

### **VOLCANO FOLKLORE: KILAUEA**

From: Oregon State University: Volcano World)

A long time ago there lived a goddess in Hawaii. She was named Pele and was a shapeshifter. One day she could be seen as a beautiful woman, while another day she would be an old woman or even a dog! While she was very powerful and well-respected, Pele also had a very bad temper. Just as she was a talented shapeshifter, Pele was skilled in many other activities. One of her talents was riding around on a holua, a wooden sled that could be used to slide down steep grass or stone mountainsides.



Photo credit:  
[www.hawaii.stateparks.org](http://www.hawaii.stateparks.org)

One day, while Pele transformed herself as a beautiful princess and was out on the mountain side, she saw the great Chief Papalauahi's great skill with the holua. Upon seeing her beauty and great skill Papalauahi and the other chiefs challenged Pele to a competition to see who the most talented rider would be. They raced down the hill time and time again, Pele winning most of the challenges. Soon, the chiefs began to notice that the grace from which Pele stood began to die and warm. They realized who she was and tried to leave. Pele was so furious that she lost that she transformed herself back into her volcanic form. She stamped with fury so that the ground shook, her lava locks flooded down the mountainside blanketing the land and all of the people who were there. The chiefs and all of the spectators are said to still stand there as the hills of Pele, known today as the Lava Trees National Park.

*Note: Kilauea is the most active of Hawaii's volcanoes and as the lava hardens around its edges, the island grows every day. There are also many legends about Pele that still exist today. Locals share stories of "Pele's Curse" which warns visitors of taking rocks or sand from the island or they will suffer bad luck.*

### **VOLCANO FEATURE: MAUNA LOA**

(From: USGS & Wikipedia)

**VOLCANO TYPE:** Shield Volcano

**LOCATION:** Hawaii, United States

**MAJOR ERUPTION:** Since 1843, the volcano has erupted over 30 times, but has only caused destruction of land.

**SIZE:** 30 miles long x 30 miles wide x 13,700 feet high

**ROCK:** Basalt is a rock formed when magma cools quickly from water. It typically contains the mineral olivine.



(Photo credit: USGS)

**DID YOU KNOW?** Known as the "Long Mountain," Mauna Loa actually takes up half the island of Hawaii's big island. It is the world's largest volcano and is actually created from a "hot spot" in the Earth's mantle. It is actually one of the youngest of the Hawaiian volcanoes, but has probably been erupting for nearly 700,000 years.