



WHAT NATURE DESTROYED
IT ALSO PRESERVED

POMPEII

THE EXHIBITION

EDUCATOR GUIDE

POMPEII

THE EXHIBITION

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WHAT TO EXPECT ON YOUR FIELD TRIP

Pompeii: The Exhibition examines the lives of the residents of Pompeii before and after the catastrophic eruption of Mount Vesuvius on August 24th, 79 A.D. Students will learn how the people of Pompeii lived, loved, worked, worshipped, and found entertainment. They may be surprised by how much they have in common with people from 2000 years ago!

Pompeii: The Exhibition features nearly 200 artifacts hidden from view and all but forgotten until their re-discovery in the 18th and 19th centuries. The sudden disaster that destroyed Pompeii also preserved it. Over time, archaeologists have uncovered a unique record of its daily life — roads, buildings, municipal services, paintings, mosaics, artifacts, and even preserved bodies. Ongoing excavations at the site provide a developing picture of life at the height of the Roman Empire.

Works of art and everyday objects from household tools and keys to tableware—all serve to tell the stories of the people of Pompeii in ways that are relatable and understandable to your class. Students will see huge frescoes that decorated the walls in homes, villas, inns, and shops. Other treasures include beautifully worked gold jewelry like a striking pair of snake-shaped bracelets, a magnificent bronze gladiator's helmet, and shin-guards decorated with scenes of gods, warriors, and barbarians. A box of surgical instruments was found next to a surgeon who tried to save the tools of his trade. Most memorable of all are the poignant casts of victims, frozen in time at the very moment of their death.

NOTE: Some of the imagery in *Pompeii: The Exhibition* contains nudity. This was an accepted aspect of ancient Roman culture and often associated with good luck and fertility. At your discretion, the Brothel Gallery can be bypassed on your tour.

THEATER

A short introductory program provides an orientation to the exhibition, helping to set the scene and prepare your class for their journey back to ancient Pompeii. Dramatic reconstructions describe Pompeii and the nearby volcano.

ATRIUM GALLERY

An Italian atrium was a large, open living space in a home. In this gallery, students will find a fascinating collection of frescoes and statues, some with religious connections.

PERISTYLE AND GARDEN GALLERY

An Italian peristyle is an outdoor living space in a private home, similar to a porch or patio. In this gallery, an assortment of statuary and outdoor decorations enhance the environment. The gardens of Pompeii were the focal point of the household.

TRICLINIUM GALLERY

Enter the triclinium, the formal dining room of an ancient Roman home. It is decorated with frescoes and mosaics. Artifacts seen here include candleholders, tables, stools, lamps, and dinnerware. Dinner was the main meal of the day and a social event that lasted for hours.

KITCHEN GALLERY

In the kitchen, students will find pans, cooking tools, jugs, and cups. Bronze, glass, and clay are a few of the materials used in Pompeii to make their utensils. Pompeii was renowned for the high quality of its garum, a sauce made from fermented fish. It was an essential ingredient in Roman cuisine made by crushing the intestines of fresh tuna and moray eels in salt. It added a sharp, salty taste to otherwise bland dishes (so they say!)



WHAT TO EXPECT ON YOUR FIELD TRIP

STREETS OF POMPEII AND MARKETPLACE GALLERY

This large gallery presents the vibrant trade industry in Pompeii. Weights and coins enabled the exchange of goods and services including jewelry, medical instruments, and body armor. Women of Pompeii took great care in personal cleansing using perfumes, creams, powders, and other cosmetics. They styled their hair and used jewelry as the final touch on their appearances. A popular form of entertainment at this time was the gladiator games. Gladiators in Roman society were revered in the same way as today's elite athletes.

ERUPTION THEATER

Having seen how people lived in Pompeii, students will now see how their lives ended. The simulated volcanic eruption leaves an indelible memory and reminds us that this distant historical disaster was a real event involving real people.

BURIED IN ASH

After the eruption, students enter the final gallery where human body casts are on display. They show those who did not flee during the first phase of eruption, when dry ash and lapilli rained down upon the city. These were the people who made a desperate run across the deep layers of accumulated ash. Instead of finding safety they were overwhelmed by the pyroclastic surges of scalding, moist ash that swept the area during the night and early morning. The wet material encased their bodies where they fell and preserved—in stark detail—facial features, grim expressions, and even the folds of their clothing. Eventually the bodies decomposed leaving an empty cavity in the now-hardened ash. These vivid portraits of human suffering are an unforgettable conclusion to the exhibition.

Pompeii: The Exhibition offers your students a unique opportunity to see the impact of STEAM learning through the ages. On this journey, they will discover how the ever-evolving world of science, technology, engineering, art, and math connects us to our past and prepares us for our future.



USING THIS EDUCATOR GUIDE

As a companion to your experience at *Pompeii: The Exhibition*, this Educator Guide has been created to complement your classroom instruction and make the most of your school field trip. It contains original, assessable, STEAM-related classroom lesson plans for three levels: Elementary School, Middle School, and High School. It is designed to be flexible and used to best meet the needs and capabilities of your class. You know your students better than anyone else!

Following this Introduction, you will find “Lessons Learned,” a section containing six interdisciplinary Classroom Activities and Project-Based Lesson Plans addressing national and local curriculum standards—two for each level. The lesson plans begin with instruction pages for teachers including answer keys and a list of the appropriate content areas and skills addressed by the activities in the lesson. Rounding out the lessons are ready-to-copy Student Activity pages centered on key STEAM topics featured on your tour.

ELEMENTARY

In the first lesson, Artifact Detective, students in Grades 3-5 discover what can be learned from the objects they see at *Pompeii: The Exhibition*—and in their own trash! Much of what we know about life in ancient Rome, including the kinds of crops and plants that grew in the Mediterranean climate, comes from the frescoes discovered in Pompeii. In The Art of Climate, students learn about the climate zone for Pompeii and then create a fresco to decorate the walls of your school.

MIDDLE SCHOOL

Students in Grades 6-8 work in groups in Casting History. They will use the techniques of Italian archeologist Giuseppe Fiorelli to make a mold that simulates

the body cavities found in Pompeii. They hear from Fiorelli himself as they compare two primary sources on the very first time this process was used in Pompeii. In Geography and Geology, students map the story of Mount Vesuvius as they delve into the geography of Pompeii and the geology of this powerful volcano.

HIGH SCHOOL

Many of the basic facts about the Roman Empire and the eruption of Mt. Vesuvius come from a pair of letters written by Pliny the Younger. In Pliny’s Point of View, students in Grades 9-12 read, analyze, and re-create Pliny’s words for themselves. Business in Pompeii is a lesson in using geometric formulas to measure some of the historic vessels seen first-hand on your field trip followed by a student challenge to design the blueprint of a Roman city based on the commercial center of Pompeii.

Under “Back in Time,” you will find frequently asked questions about Pompeii for students a timeline of significant moments in the rediscovery of Pompeii, and a glossary of volcano-related terms.

We know how important it is to justify field trips and document how instructional time is spent outside of your classroom. To that end, this Educator Guide is directly correlated to the Common Core State Standards for English Language Arts and Mathematics, the C3 Framework for Social Studies State Standards, Next Generation Science Standards, and the National Core Arts Standards. These correlations are organized by grade level and content. You can readily see how they fit into your required curriculum, making it easy to connect a field trip to *Pompeii: The Exhibition* with your classroom instruction.

All of these education resources can be used before or after your field trip. They will help prepare students for the teachable moments found throughout Pompeii: The Exhibition. When you get back to school, you can refer to this Educator Guide as you continue to explore connections between the themes of the tour and your classroom STEAM instruction. Take your 21st century students to first century Pompeii and see how daily life has changed – or not changed! – in 2000 years.



POMPEII
THE EXHIBITION

ELEMENTARY

SOCIAL STUDIES, MATHEMATICS
History, Using Evidence, Measurement & Data

Elementary School Lesson Plan 1: Artifact Detective

Teacher Instructions

When Pompeii was rediscovered centuries after it was buried by the eruption of Mt. Vesuvius, many valuable artifacts were taken from the ground and sent to museums for display. No one took field notes on exactly where an object was found or what else it was found with, leaving many important details unknown. These missing facts, or context, help historians understand more about an artifact, such as how an object might have been used and by whom.

For example, in the Atrium gallery of Pompeii: The Exhibition, you will see beautiful sculptures of women's heads, called "busts." Without knowing where they were originally found in Pompeii, many questions remain. Were they found in a temple and supposed to represent goddesses? Were they found in someone's home and are wives of wealthy merchants? Perhaps archaeologists found them in a garden, and they came from statues celebrating favorite myths and legends.

Similarly, you will see two bronze keys in the Atrium gallery on your class visit to the exhibition. If these artifacts were found at a house, they were most likely used to lock the doors or gates. However, history tells us that keys had many other uses in ancient Rome. They locked shop and warehouse doors, cupboards, and even caskets. Knowing where in Pompeii these keys were found would help us make a much better guess about how they were used.

Scientists and historians have to work together in order to preserve these objects while learning from them. As your class will discover in this lesson, it sometimes even requires becoming an artifact detective! Students might be surprised to find out that people in Pompeii had many of the same careers we do today such as restaurant owners, artists, teachers, businessmen, carpenters, bakers, artists, athletes, and bankers (or mon-

ey lenders). How do we know? The artifacts tell us! In Part 1, your students will match collections of artifacts from Pompeii: The Exhibition with the person they might reveal to us: a doctor, gardener, fisherman, gladiator, or a wealthy woman.

Continuing their investigation, students will see that some artifacts from the kitchens of Pompeii look like they could be in a modern kitchen: colanders, pans, plates, and mugs. Others are a bit more unusual, such as the glirarium, which was a terra cotta pot used to raise and fatten up dormice (small rodents)—a special delicacy on an ancient Roman menu! How do the kitchen and dining wares of ancient Rome compare to those of today? The measurement activity in part 2 uses artifacts from both the Kitchen and the Triclinium (dining room) galleries of Pompeii: The Exhibition to discover the differences. Students will need a metric ruler to measure the objects and examples of a modern-day kitchen colander, plate, mug, pitcher or jug, and cooking pot to compare to their counterparts from Pompeii.

Many of the priceless artifacts you see at Pompeii: The Exhibition were once simple, everyday items from people's houses. These items are fascinating because they give us an idea of what life was like for the average person in ancient Rome, and not just for the emperors, senators, and famous gladiators we often read about in books. What would the tools and objects your students use every day tell an archaeologist 2000 years from now about life in the 21st century? If these archaeologists of the future sifted through your trash and recycling, what would its contents—its artifacts—tell them about your community? Students will dig in and write their field notes in Part 3, which also works well as a homework assignment.



ELEMENTARY

SOCIAL STUDIES, MATHEMATICS
History, Using Evidence, Measurement & Data

ANSWER KEY

Part 1

1.c, 2.a, 3.e, 4.d, 5.b

Part 2

The answers for #1-5 will vary based on the actual object measured. Students should also provide one example of how the items from Pompeii and today are the same and one way they are different.

6. Object: Plate

Height	40 mm	4 cm	0.04 m
Diameter	140 mm	14 cm	0.14 m

7. Object: Mug

Height	98 mm	9.8 cm	0.098 m
Diameter	114 mm	11.4 cm	0.114 m

8. Answers will vary but students will probably choose millimeters or centimeters because the objects being measured are smaller/less than a meter

Part 3

Answers will vary based in objects selected, but the chart should be completed with five items and five logical extrapolations from those objects



ARTIFACT DETECTIVE

Student Activity

When Pompeii was rediscovered centuries after it was buried by the eruption of Mt. Vesuvius, many valuable artifacts were taken from the ground and sent to museums for display. No one took field notes on exactly where an object was found or what else it was found with, leaving many important details unknown. These missing facts, or context, help historians understand more about an artifact, such as how an object might have been used and by whom.

For example, in the Atrium gallery of Pompeii: The Exhibition, you will see beautiful sculptures of women's heads, called "busts." Without knowing where they were originally found in Pompeii, many questions remain. Were they found in a temple and supposed to represent goddesses? Were they found in someone's home and are wives of wealthy merchants? Perhaps archaeologists found them in a garden, and they came from statues celebrating favorite myths and legends.

Similarly, you will see two bronze keys in the Atrium gallery on your class visit to the exhibition. If these artifacts were found at a house, they were most likely used to lock the doors or gates. However, history tells us that keys had many other uses in ancient Rome. They locked shop and warehouse doors, cupboards, and even caskets. Knowing where in Pompeii these keys were found would help us make a much better guess at how they were used.

Scientists and historians have to work together in order to preserve these objects while learning from them. Sometimes it even requires becoming an artifact detective! In these activities, you will discover what can be learned from the artifacts at *Pompeii: The Exhibition*—and in your own trash!

Terms to Know: archaeologist, artifact, atrium, bronze, casket, ceramic, cesspit, conserve, context, delicacy, diameter, dormouse, lavatory, pitcher, terra cotta



These bronze keys found in one of the largest and most luxurious homes in Pompeii. They were used for complex locks, but Roman locks could only be opened from one side of the door.

POMPEII
THE EXHIBITION

TO WHOM DID THESE ARTIFACTS BELONG?



Part 1: Who's Who

Match each collection of artifacts below from *Pompeii: The Exhibition* with the person they might reveal to us.

- | | |
|--------------|------------------|
| a. Doctor | d. Gladiator |
| b. Gardener | e. Wealthy woman |
| c. Fisherman | |

1. _____ Anchor, fishing needle, weights for fishing net, fishing hooks
2. _____ Case for medical kit, suction cup, scalpels, tweezers
3. _____ Gold and emerald necklace, gold bracelet and rings, pearl earrings
4. _____ Bronze helmet, shin guards, spear head, tool for cleaning armor
5. _____ Iron hoe, hatchet, rake, sickle

Part 2: Metric Measures

Some artifacts from the kitchens of Pompeii look like they could be in your kitchen: colanders, pans, plates, and mugs. Others are a bit more unusual, such as the glirarium, which was a terra cotta pot used to raise and fatten up dormice (small rodents) —a special delicacy on an ancient Roman menu!

How do the kitchen and dining wares of Pompeii compare to those of today? Complete this measurement activity using artifacts from both the Kitchen and the Triclinium (dining room) galleries of Pompeii: The Exhibition to find out!

Supplies: ruler with centimeters, colander, plate, mug, pitcher or jug, cooking pot

1. Object: Colander with handle



	<i>Pompeii: The Exhibition</i>	Today
Length	30.5 cm	
Height	16.5 cm	
Diameter	14 cm	
Material	Bronze metal	



Colanders, like this bronze one, were abundant in Pompeian households. The geometric patterns punched into the bowl served as decoration when they were stored on kitchen walls.

a. How are the colanders the same? _____

b. How are the colanders different? _____



Name _____

Class _____

Date _____

2. Object: Plate



Plate

	<i>Pompeii: The Exhibition</i>	Today
Height	4 cm	
Diameter	14 cm	
Material	Clay pottery	

a. How are the plates the same? _____

b. How are the plates different? _____

3. Object: Mug (Tankard)



Ceramic mug or tankard

	<i>Pompeii: The Exhibition</i>	Today
Height	9.8 cm	
Diameter	11.4 cm	
Material	Ceramic pottery	

a. How are the mugs the same? _____

b. How are the mugs different? _____



Name _____

Class _____

Date _____

4. Object: Jug or pitcher



Ceramic mug or tankard

	<i>Pompeii: The Exhibition</i>	Today
Height	21 cm	
Diameter at widest part	17.8 cm	
Material	Ceramic pottery	

a. How are the pitchers the same? _____

b. How are the pitchers different? _____

5. Object: Cooking pot



Bronze cooking pot. Pans hung in the kitchen and were used by household slaves to prepare meals for family and guests.

	<i>Pompeii: The Exhibition</i>	Today
Height	11.7 cm	
Diameter at opening	13.5 cm	
Diameter at widest part	20 cm	
Material	Bronze metal	

a. How are the pots the same? _____

b. How are the pots different? _____



In the United States, we usually measure length in inches and feet. Other countries use the metric system, including Italy where Pompeii is located. Scientists and historians usually measure with the metric system, too. Practice converting centimeters to both millimeters and meters by using the dimensions of two Pompeiian artifacts from above: the plate and the mug. The pitcher's measurements are converted for you as an example.

Object: Pitcher



	Millimeters	Centimeters	Meters
Height	210 mm	21 cm	0.21 m
Diameter	178 mm	17.8 cm	0.178

6. Object: Plate



	Millimeters	Centimeters	Meters
Height		4 cm	
Diameter		14 cm	

7. Object: Mug



	Millimeters	Centimeters	Meters
Height		9.8 cm	
Diameter		11.4 cm	

8. Within the metric system, which unit do you think is better for measuring artifacts, millimeter, centimeter, or meter? Why?



Part 3: Field Notes

There is one item in the kitchens of ancient Rome that you will definitely not find in a house today: the toilet. A kitchen counter held a hearth for cooking and a sink with a wastepipe that was hooked up to the drain of a lavatory. All kinds of waste went into the lavatory, including broken dishes, old lamps, jewelry, and food scraps. For archaeologists, these underground holding tanks, called cesspits, are like gold mines! In 2007, a huge pit was found under Herculaneum. Herculaneum is a town near Pompeii that was also buried by the eruption of Mt. Vesuvius in 79 A.D. The objects found in there tell us what daily life was like for the people in ancient times.

If archaeologists of the future sifted through your classroom's or family's trash and recycling, what would its contents—its artifacts—tell them about you and your community? You may want to wear rubber gloves for this dig!



A counter in the culina, or kitchen, held a hearth for cooking and a sink with a wastepipe that hooked up to the drain of a nearby toilet.

The glirarium has spiral shelves inside, two food tanks, and multiple air holes. It encouraged dormice to hibernate in captivity where they were fattened until they became a delicious snack.



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Supplies: ruler with centimeters, colander, plate, mug, pitcher or jug, cooking pot

Artifact	Information
Chicken bones	People's diets included protein from animals.
Broken cell phone	It was cheaper to throw away some forms of technology and get a new one rather than get the old one repaired.
1.	
2.	
3.	
4.	
5.	



ELEMENTARY

SCIENCE, MATHEMATICS, FINE ARTS, SOCIAL STUDIES
Earth Science, Measurement & Data, Visual Art, Geography

Elementary School Lesson Plan 2: The Art of Climate

Teacher Instructions

Pompeii is located in a region of Italy with a mild, sunny climate. Farmers in the countryside and gardeners in the city could grow almost any kind of food. Romans took great pride in their gardens. A home's peristyle, or inner garden and courtyard, was the center of family life. Gardens were filled with trees, shrubs and flowers of many kinds. Just outside of town, farmers could grow crops three of the four seasons in the year. What were the seasons like for the people of Pompeii? How did their climate compare to your own? In Part 1 of this activity, your students will create a bar graph to answer these questions and more.

In addition to a nice climate, the soil in Pompeii was very fertile. The land closest to Mount Vesuvius was used to grow grapes for wine. Layers of ash from long-ago eruptions had enriched the soil with minerals. Pompeii became famous for its vineyards and wines and the city filled with statues, frescoes, and mosaics of Bacchus, the Roman god of winemaking. One fresco from Pompeii shows Bacchus next to the oldest image of Vesuvius that has ever been found! See if you can spot this image on a sign inside Pompeii: The Exhibition. Much of what we know about life in ancient Rome, including the kinds of crops and plants that grew in the Mediterranean climate, comes from these frescoes discovered in Pompeii.

A fresco is a painting made on wet plaster. In Pompeii, frescoes decorated the walls in almost every room of the house. The topic of the frescoes often matched

the uses of the room. Two frescoes with fruit appear in the Triclinium gallery in Pompeii: The Exhibition. The triclinium was the dining room, so pictures of food were popular. What kinds of frescoes do you think should decorate a classroom? What people, object, or activity should they show? In Part 2, your students will design and paint a fresco to decorate the walls of your school. Student can work individually or collaboratively in groups to make their frescoes. The materials listed below will make one fresco. Adjust the amount of supplies based on your class size.

Materials

- Plain white paper
- Pencils and colored pencils
- Plastic plate
- Acrylic, tempura, or watercolor paints
- Paint brushes
- Spray bottle with water
- 1-inch pieces of drinking straw
- Plaster of Paris mix
- Items for preparing plaster
 - o Measuring cups
 - o Water
 - o Plastic/disposable bowl for mixing
 - o Plastic spoon for stirring



ELEMENTARY

SCIENCE, MATHEMATICS, FINE ARTS, SOCIAL STUDIES
Earth Science, Measurement & Data, Visual Art, Geography

ANSWER KEY

Part 1

1. (a.) January; (b.) August
2. 30°
3. June and September
4. Answers will vary based on your climate
5. Answers will vary based on your climate
6. Answers will vary but should address that crops need a good climate to grow well
7. Fall; it's too warm in August to wear heavy clothing
8. The temperatures in this area during the year are neither extremely hot nor extremely cold





This fresco from a house in Pompeii shows Mount Vesuvius and Bacchus, the god of winemaking. It is the first known painting of the volcano.

THE ART OF CLIMATE

Student Activity

Pompeii is located in a region of Italy with a mild, sunny climate. Farmers in the countryside and gardeners in the city could grow almost any kind of food. Romans took great pride in their gardens. A home's peristyle, or inner garden and courtyard, was the center of family life. Gardens were filled with trees, shrubs and flowers of many kinds. Just outside of town, farmers could grow crops three of the four seasons in the year. What were the seasons like for the people of Pompeii? How did their climate compare to your own? In Part 1 of this activity, you will create a bar graph to answer these questions and more.

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frescoes with fruit appear in the Triclinium gallery in Pompeii: The Exhibition. The triclinium was the dining room, so pictures of food were popular. What kinds of frescoes do you think should decorate a classroom? What people, object, or activity should they show? In Part 2, you will design and paint a fresco to decorate the walls of your school.



These frescoes of pomegranates and pears were painted on the wall of a triclinium. Fresh fruit was plentiful in Pompeii, thanks to the climate.

Terms to Know: depict, enriched, fertile, fresco, mosaic, pomegranate, temperate, vineyard



Part 1: Climate

Create a bar graph for the monthly temperature averages in Naples, the nearest large city to Pompeii, to see how warm or cold it is in this climate zone.

Month	Average Temperature
January	47°
February	48°
March	51°
April	56°
May	64°
June	70°

Month	Average Temperature
July	76°
August	77°
September	70°
October	63°
November	54°
December	49°

85°												
80°												
75°												
70°												
65°												
60°												
55°												
50°												
45°												
40°												
35°												
30°												
	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Name _____

Class _____

Date _____

Answer these questions using the information in your bar graph.

1. (a.) Which month is the coldest? (b.) Which month is the warmest?

2. What is the difference in temperature between the coldest and warmest months?

3. Which two months have the same average temperatures?

4. How do the warmest months of the year in Naples and Pompeii compare to summer where you live?

5. How do the coldest months of the year in Naples and Pompeii compare to winter where you live?



Name _____

Class _____

Date _____

6. The region of Italy around Pompeii has a mild, sunny climate. What effect do you think this climate has on growing crops in the area?

7. For many years, scientists and historians thought that Vesuvius erupted in August of the year 79 A.D. New research suggests it may have happened in October or November. One clue is that some of the people in Pompeii wore heavy clothing when they were killed by the volcano. Which season does this evidence suggest for the eruption? Why?

8. The word “temperate” means mild, or not too extreme. Based on your graph above, why is that a good description for the climate zone where Pompeii is located?



These charred raisins were found in Pompeii. Raisins and grape seeds were found all over Pompeii and Herculaneum. Modern scientists replanted the vineyards of Pompeii and were surprised by how quickly the vines grew.

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Part 2: Art

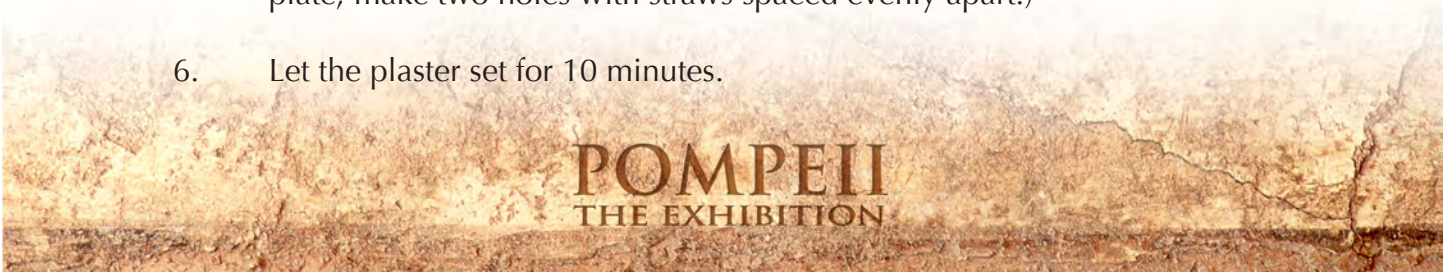
Pick a room in your school, such as the library, gymnasium, your classroom, cafeteria, or music room to represent in your own fresco. After you select a location, decide on what people, object, or activity your fresco will show for that room. Follow the steps below to complete your project.

Materials

- Plain white paper
- Pencils and colored pencils
- Plastic plate
- Acrylic, tempura, or watercolor paints
- Paint brushes
- Spray bottle with water
- 1-inch pieces of drinking straw
- Plaster of Paris mix
- Items for preparing plaster
 - o Measuring cups
 - o Water
 - o Plastic/disposable bowl for mixing
 - o Plastic spoon for stirring

Steps

1. Use the paper and pencils to design and sketch a rough draft of your picture on the piece of paper before you begin painting. The plaster will dry quickly, so you need to have a design already planned before you begin painting.
2. Mix the plaster of Paris according to the package directions.
3. Use your stirring spoon to spread the plaster on your paper plate until it is a smooth layer, about 1/4-inch thick.
4. Decide where you want the top of your painting to be, based on your sketch.
5. Push the 1-inch piece of straw into the plaster near the top. Do not push the straw all the way through the plate. (When you are finished and your fresco is dry, this will be the hole for hanging your fresco. If you are using a large paper plate, make two holes with straws spaced evenly apart.)
6. Let the plaster set for 10 minutes.



7. Begin painting your masterpiece! The plaster needs to stay wet while you are painting. If it starts to dry and harden, dampen the surface using the spray bottle with water.
8. Let your fresco dry completely overnight.
9. When it is dry, carefully remove the fresco from the paper plate. Pull out the piece of straw, too.

Decorate the Walls

Present your finished fresco to your class. Explain the reasons you chose the particular location in your school and the subject (person, object, activity) of your art. Include the sketch you made before you began the fresco. Hang your 21st century fresco on the wall to decorate the room in your school that you chose, just as the Romans did in the first century.



This fish fresco may have advertised the local fish market or perhaps a shop that sold garum, a flavorful sauce made from fermented fish.

POMPEII
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MIDDLE SCHOOL

SOCIAL STUDIES, SCIENCE, MATHEMATICS
Geography, History, Earth Science, Expressions & Equations

Middle School Lesson Plan 1: Geography and Geology

Teacher Instructions

Geography and geology were both key to Pompeii's commercial success and cultural diversity in 79 A.D. With ports on the Bay of Naples and paved roads connecting nearby towns, this region benefitted from all the Roman Empire had to offer, including the rich agriculture in the area. Fertile lands surrounding Vesuvius provided enough crops to keep at home, sell in market, and trade abroad.

In sharp contrast with the limestone-based soil of most of southern Italy, Pompeii had some of the richest land on Earth because of volcanic deposits laid down after eruptions of Vesuvius thousands of years earlier. Along with a mild, sunny climate, the land provided three annual crops of all kinds of fruits and vegetables. Farmers in the countryside and gardeners in the city could grow almost any kind of food. Local wines, olive oils, and onions were produced here and shipped around the Mediterranean world.

Pompeii's location next to Vesuvius was also the key to its destruction. The collision of two tectonic plates created the mountain, which has erupted many times in its geological life. Some of these events built up the cone, making it taller, while others have blown off the top, forming craters. With its most recent eruption in 1944, Vesuvius is still considered to be an active volcano. Scientists know that there will be another catastrophic eruption someday, but they don't when it will happen.

One thing is certain. Mt. Vesuvius is part of a group of several volcanoes that form the Campanian volcanic arc. Some of these volcanoes are considered active, like Vesuvius, while others are dormant or even extinct. All were formed by the collision of the African and Eurasian plates. When a heavier oceanic plate (the African) collides with a land plate (the Eurasian), it subducts, or sinks beneath, the land plate. This subduction zone between the tectonic plates stretches along the length of the Italian peninsula.

Pompeii: The Exhibition provides a glimpse of daily life in this geographic zone during the first century. In the activities below, your students will delve into the geography of Pompeii and the geology of Mt. Vesuvius. Students will need a blank map of Italy, enlarged to focus on the area centered on the Bay of Naples so they can accurately label the locations discussed in this assignment.

If your class Social Studies textbook does not already provide blackline master maps for you to copy, there are several collections available online:

- www.worldatlas.com/webimage/countrys/europe/outline/it.htm
- www.freeworldmaps.net/europe/italy/political.html
- www.d-maps.com/pays.php?num_pay=200



MIDDLE SCHOOL

SOCIAL STUDIES, SCIENCE, MATHEMATICS
Geography, History, Earth Science, Expressions & Equations

ANSWER KEY

3. (a.) Pompeii is about 150 miles south of Rome. (b.) Naples is 17 miles away from Pompeii; 15-20 miles is an acceptable answer.

4. (a.) 3 days by ox cart; (b.) 15 days by walking

5. (a.) Less than a day/between 8-9 hours by ox cart; (b.) 1 ½ - 2 days by walking

6. 19 miles/less than 20 miles

8. Southeast of the mountain

10. Answers can vary, but should mention population density in the area and the threat to human lives



GEOGRAPHY AND GEOLOGY

Student Activity

Geography and geology were both key to Pompeii's commercial success and cultural diversity in 79 A.D. With ports on the Bay of Naples and paved roads connecting nearby towns, this region benefitted from all the Roman Empire had to offer, including the rich agriculture in the area. Fertile lands surrounding Vesuvius provided enough crops to keep at home, sell in market, and trade abroad.

In sharp contrast with the limestone-based soil of the rest of southern Italy, Pompeii had some of the richest land on Earth because of volcanic deposits laid down after eruptions of Vesuvius thousands of years earlier. Along with a mild, sunny climate, the land provided three annual crops of all kinds of fruits and vegetables. Farmers in the countryside and gardeners in the city could grow almost any kind of food. Local wines, olive oils, and onions were produced here and shipped around the Mediterranean world.

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eruption someday, but they don't know when it will happen.

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Pompeii: The Exhibition provides a glimpse of daily life in the first century of the Roman Empire. In the activities below, you will map your discoveries as you delve deeper into the geography of Pompeii and the geology of Mt. Vesuvius.

The village of Misenum was far enough from the volcano to avoid destruction, but close enough for Pliny the Younger to witness the eruption.



In 79 A.D., Pompeii was a bustling metropolis still recovering from an earthquake in 62 A.D.—a precursor for what was to come 17 years later.

Terms to Know: caldera, dormant, fertile, pyroclastic, subduct, tectonic

POMPEII
THE EXHIBITION

You will need the blank map from your teacher, a modern atlas, and an historical atlas if these are not already included in your Social Studies textbook. For locations whose names have changed since the first century A.D., the modern name is in parentheses. Create a key to show what the symbols on your map will mean.

1. The ruins of Pompeii and Herculaneum provide archaeologists, historians, and scientists unique glimpses of life in ancient Rome. The discoveries made there are the sources of the amazing artifacts seen at *Pompeii: The Exhibition*.

(a.) Ancient Pompeii was near the modern town of "Pompei." Today it is inland, but at the time of the eruption it would have been nearer to the coast. Pompeii is five miles away from Mount Vesuvius. Identify and label both the ancient and modern locations.

(b.) Herculaneum (Ercolano) appears to have been a wealthier town than Pompeii, but more of it is unexcavated. It is nine miles northwest of Pompeii. Locate and label Herculaneum on the map.

2. Locate and label the following physical features on your map:

- Mount Vesuvius
- Water: Bay of Naples, Tyrrhenian Sea, Sarno River, Tiber River, Volturno River
- Islands: Capri, Sicily, Sardinia, Ischia

3. Add the cities of Rome and Naples to your map. Use the scale to estimate the distance between Pompeii and these two cities.

(a.) How many miles are between Pompeii and Rome?

(b.) How many miles are between Pompeii and Naples?

4. Today, the train ride between Pompeii and Rome is about two hours. How many days it would take to you travel from Pompeii to Rome in 79 A.D....

(a.) ...by ox cart, a popular mode of transportation at the time, if you traveled 50 miles per day?

(b.) ...by walking, the way slaves, poor freedmen, and women traveled, at 10 miles per day?

5. Today, the train ride between Pompeii and Naples is about 30-40 minutes. How many days would it take to you travel from Pompeii to Naples in 79 A.D....

(a.) ...by ox cart, a popular mode of transportation at the time, if you traveled 50 miles per day?

(b.) ...by walking, the way slaves, poor freedmen, and women traveled, at 10 miles per day?

6. The only surviving primary source describing the eruption in 79 A.D. comes from Pliny the Younger. At the time, he was 18 years old and living with his uncle. Pliny the Younger witnessed the eruption from his home in Misenum (Miseno). Add Misenum to your map. Use the scale on your atlas to estimate the distance between Misenum and Mt. Vesuvius.

7. Pliny the Younger's uncle, Pliny the Elder, was in charge of the Roman navy. He sailed across the Bay of Naples to rescue people. He left Misenum with a fleet of ships headed towards Oplontis (Torre Annunziata). He was unable to reach the coast. Oplontis was buried in the eruption. Instead, he landed at Stabiae (Castellammare di Stabia), where he died.

(a.) Add Oplontis and Stabiae to your map.

(b.) Draw a line to represent Pliny the Elder's route.

Before 79 A.D., Vesuvius had not had a major eruption for almost 700 years.



POMPEII
THE EXHIBITION

Name _____

Class _____

Date _____

8. Based on the locations of the towns that Vesuvius destroyed, in which direction do you think the lava, ash, and the pyroclastic surges flowed from the volcano?

9. Mt. Vesuvius is the only volcano in the Campanian volcanic arc to erupt in recent times. The arc, centered on the Bay of Naples, forms the southern end of a larger chain of volcanoes, all produced at the boundary between the African and Eurasian tectonic plates. Some are underwater while others are visible. Locate these visible volcanoes and add them to your map.

- Campi Flegrei, a large caldera to the northwest of Mt. Vesuvius
- Mt. Epomeo, on Ischia
- Stromboli, a volcanic island in the Tyrrhenian Sea
- Vulcano, a volcanic island in the Tyrrhenian Sea
- Mt. Etna, on Sicily
- Monte Cavo, southeast of Rome

10. Although it is not the largest, Vesuvius is sometimes called the most dangerous volcano in the world. For what reason do you think it might have been given this name?



This image from NASA shows the densely-populated areas around Mt. Vesuvius. It is closely monitored for potential signs of unrest that could signal the beginning of another eruption.

POMPEII
THE EXHIBITION

MIDDLE SCHOOL

SOCIAL STUDIES, LANGUAGE ARTS, FINE ARTS, SCIENCE
History, Primary Sources, Visual Art, Earth Science

Middle School Lesson Plan 2: Casting History

Teacher Instructions

In a matter of hours, Pompeii was transformed forever by the catastrophic eruption of Mount Vesuvius. Thousands lost their lives as hot air, mud, lava, ash, and toxic gases poured from the volcano, burying streets, homes, gardens, temples, and workplaces. But the sudden disaster that destroyed Pompeii in 79 A.D. also preserved it. In the 1740s, the city was rediscovered. Over time, archaeologists uncovered a unique record of an entire ancient civilization, sealed in a time capsule. Much of what we know and understand about life at the height of the Roman Empire comes from the ruins of Pompeii.

The final gallery of Pompeii: The Exhibition displays the most poignant finds among the ruins. These are the people who did not flee during the first phase of eruption, when dry ash and lapilli rained down upon the city. They hid in their shops and homes and decided, hours later, to make a desperate run across the deep layers of accumulating ash. Instead of finding safety, they were overwhelmed by the pyroclastic surges that swept the area during the night and early morning. The wet material encased their bodies where they fell and preserved, facial features, grim expressions, and even the folds of their clothing. Eventually the bodies

decomposed leaving an empty cavity in the now hardened ash.

In 1863, Italian archaeologist Giuseppe Fiorelli poured liquid plaster into an empty hole found by his team of excavators. He knew that the hole had been created when the layers of molten ash from Vesuvius hardened around one of the victims. After the plaster dried, the ash and dirt surrounding it were chipped away. The results were astonishing. No one expected to see the men, women, and children killed by Vesuvius in such striking detail.

Students should work in groups to complete Part 1 of this lesson plan. Using dolls, they will make a mold that simulates the body cavities found in Pompeii and create their own plaster casts using Fiorelli's techniques. The materials needed for Part 1 are listed below. In Part 2, students will hear from Fiorelli himself when they compare two primary sources on the very first time this process was used in Pompeii. Both primary source excerpts come from the book *Pompeii's Living Statues: Ancient Roman Lives Stolen from Death* by Eugene J. Dwyer (University of Michigan Press, 2010).



MIDDLE SCHOOL

SOCIAL STUDIES, LANGUAGE ARTS, FINE ARTS, SCIENCE
History, Primary Sources, Visual Art, Earth Science

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| <ul style="list-style-type: none">• Old doll, dressed and accessorized• Petroleum jelly (Vaseline®)• Silicone rubber epoxy or other quick-set silicone rubber mix• Plastic food storage container, larger than the doll• Small wood dowel• Ruler• Scissors | <ul style="list-style-type: none">• Funnel• Masking tape• Plaster of Paris• Mixing bowl• Spoon• Water• Paper towels• Sand paper |
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MIDDLE SCHOOL

SOCIAL STUDIES, LANGUAGE ARTS, FINE ARTS, SCIENCE
History, Primary Sources, Visual Art, Earth Science

ANSWER KEY

Part 2

1. Location: "in a small street near the baths, and right in the middle of the street"
2. Artifacts found: "about a hundred silver coins, four earrings, and a small finger ring of gold, with two iron keys and some traces of cloth in which the coins had been wrapped"
3. Term for the liquid plaster: scagliola, gesso
4. Description of man's shoes: "a type of boots to which nails and the iron lasts of the soles still adhered"
5. Description of the man's face: "The nose and the cheeks could be seen clearly. The eyes were missing, as was the hair. In the open mouth, he was missing some teeth"
6. (a.) Fiorelli; (b.) Settembrini
7. Bones
8. They could see the imprint of his trousers
9. It was where the hole was through which the gesso had entered
10. drowned
11. (a.) 50 years old; (b.) Settembrini; (c.) Answers will vary. Some students might say "yes" because the description of the victim could fit a man who is 50. Some students might say "no" because there was no way for Settembrini to know for sure how old the victim was just by looking at the cast.
12. (a.) November, because they would not be wearing heavy clothing in the summer; (b.) Food: if there are remains of foods only available in the fall. Coins: with dates on them after August suggest the fall.



CASTING HISTORY

Student Activity

In a matter of hours, Pompeii was transformed forever by the catastrophic eruption of Mount Vesuvius. Thousands lost their lives as hot air, mud, lava, ash, and toxic gases poured from the volcano, burying streets, homes, gardens, temples, and workplaces. But the sudden disaster that destroyed Pompeii in 79 A.D. also preserved it. In the 1740s, the city was rediscovered. Over time, archaeologists uncovered a unique record of an entire ancient civilization, sealed in a time capsule. Much of what we know and understand about life at the height of the Roman Empire comes from the ruins of Pompeii.

The final gallery of Pompeii: The Exhibition displays the most poignant finds among the ruins of Pompeii. These are the people who did not flee during the first phase of eruption, when dry ash and lapilli rained down upon the city. They hid in their shops and homes and decided, hours later, to make a run for it across the deep layers



The plaster casting method has been used for plant roots, wooden doors and shutters, and animals. This dog was found by the front door of the House of Orpheus, probably left to guard the home while the family fled.



Advances in technology allow us to learn more about Vesuvius' victims without damaging the plaster casts. CT scans revealed that this child was a boy about four years old.

of accumulating ash. Instead of finding safety they were overwhelmed by the pyroclastic surges that swept the area during the night and early morning. The wet material encased their bodies where they fell and preserved facial features, grim expressions, and even the folds of their clothing. Eventually the bodies decomposed leaving an empty cavity in the now hardened ash.

In 1863, Italian archaeologist Giuseppe Fiorelli poured liquid plaster into an empty hole found by his team of excavators. He knew that the hole had been created when the layers of molten ash from Vesuvius hardened around one of the victims. After the plaster dried, the ash and dirt surrounding it were chipped away. The results were astonishing. No one expected to see the men, women, and children killed by Vesuvius in such striking detail.

In Part 1, you will work in groups to make a mold that simulates the body cavities found in Pompeii and create your own plaster casts using Fiorelli's techniques on old dolls. In Part 2, you will hear from Fiorelli himself when you compare two primary sources on the very first time this process was used in Pompeii.

Charred raisins and barley. How does knowing which foods were available help scientists determine when Vesuvius erupted?



Terms to Know: accretion, dowel, epoxy, excavators, lapilli, poignant, pyroclastic, resin, silicone, simulate, trowel, utilitarian, vapors

POMPEII
THE EXHIBITION

Part 1

In this activity, you will begin by creating a mold that simulates the cavities found underground in Pompeii. Then, in Procedure 2, you will make a body cast from the mold using the same techniques as Giuseppe Fiorelli, Director of Excavations at Pompeii in the late 1800s.

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|--|--|
| <ul style="list-style-type: none">• Old doll, dressed and accessorized• Petroleum jelly (Vaseline®)• Silicone rubber epoxy or other quick-set silicone rubber mix• Plastic food storage container, larger than the doll• Small wood dowel• Ruler• Scissors | <ul style="list-style-type: none">• Funnel• Masking tape• Plaster of Paris• Mixing bowl• Spoon• Water• Paper towels• Sand paper |
|--|--|

Procedure 1

1. Protect your work area!
2. Select a doll that you don't mind getting messy. It can be wearing clothes, jewelry, or other accessories if you like. Make sure your doll fits inside your plastic container lengthwise and that the container is much deeper than the doll when it is lying down.
3. Lay your doll lengthwise in your container. Measure the space from the top of its head to the side of plastic container above it. Cut the dowel to this length.
4. Remove the doll from the container. Apply a thin layer of petroleum jelly to your doll and to the dowel you just measured and cut.
5. Coat the inside of the container with petroleum jelly.
6. Mix the silicone rubber epoxy according to package directions.
7. Pour enough epoxy into the container that the doll will be submerged lying down without touching the bottom. Smooth the surface of this layer of epoxy.
8. Place one end of the dowel flush against an end of the container and the other against the top of the doll's head. Push it into the epoxy until it is half submerged. (This creates the space for you to pour plaster into the mold in Procedure 2.)
9. With the top of the doll's head against the dowel, press your doll face-down into the epoxy, so that the front half of the doll is submerged.
10. Allow the epoxy to dry, according to package instructions.
11. When the epoxy is dry, apply a thin layer of petroleum jelly on top of it and on the exposed part of the doll and dowel if the previous application (in Step 4) has come off.
12. Pour more epoxy over the doll until it is fully covered. Leave this layer to dry, according to package instructions.
13. When the epoxy is dry, take your new mold out of the plastic container.
14. Slowly separate the two halves of your epoxy mold. Remove the doll and dowel.

Procedure 2

1. Use damp paper towels to wipe out the epoxy doll mold you made in Part 1. When the molds are clean, dry them with another paper towel.
2. Use a paper towel to grease the inside of mold with petroleum jelly. Make sure that you get the petroleum jelly into all cracks and small details of the mold.
3. Use the masking tape to put the two halves of your doll mold back together, as one block. Make sure the impressions where the dowel was placed on each side of the mold line up with each other on the top.
4. Follow the instructions on the container of plaster of Paris to mix it. Each container may have different instructions, so take care that you do not add too much water.
5. Slowly pour the plaster into your mold through the hole created by the dowel in Procedure 1. If you pour too quickly, you will end up with air bubbles. It may help to use the funnel.
6. When you have filled the mold to the top, hold it level with both hands and gently tap it on a table to help release the air bubbles. If the level of plaster in your mold settles down, add more to the top and repeat this step.
7. Set the mold aside to dry, according to package instructions.
8. When the plaster is dry, untape the mold and carefully separate its two halves. Remove the plaster body that formed inside.
9. Gently break off the stick of plaster from where you poured it into the mold. Use the sand paper to smooth down this and any other rough areas, such as the line where the two halves of the mold came together.

Discuss—Art or Science?

When the plaster casts were first made in the 19th century, some people felt that they should be considered as art, like sculptures. Others said the casts were either too upsetting or too utilitarian to be art. Based on the results you obtained with your cast of the doll, which side of the argument do you support and why?

Found in the eastern part of Pompeii, this cast is also known as the "muleteer" for the mule or donkey that was found nearby. Through the casting process, we know that this man crouched low to the ground and pulled his cloak over his mouth to shield himself.



Part 2

Read and compare two primary sources describing the first plaster body cast from Pompeii, made with a method very similar to how you created the cast of the doll in Part 1.

The first description is from Fiorelli himself. He announced his discovery in a Naples newspaper on February 12, 1863.

On the third of this month, while digging in the small street that begins opposite one of the secondary doors of the Stabian Baths and issues in the vicinity of the Building of Eumachia, were found, at the height of five meters above the soil, about a hundred silver coins, four earrings, and a small finger ring of gold, with two iron keys and some traces of cloth in which the coins had been wrapped. In a close search of the earth, lest any of this precious treasure be missed, we came to a place where the earth gave way under the trowel, revealing a hollow cavity deep enough to reach in at arm's length and remove some bones. I realized immediately that this was the impression of a human body, and I thought that by quickly pouring in scagliola [plaster], the cast of an entire person would be obtained. The result surpassed my every expectation. After some days of difficult work, I had the pleasure to see arise the entire figure of a man, missing only a small portion of the right side, wrapped in a cloak, with long trousers and feet enclosed in a type of boots to which nails and the iron lasts of the soles still adhered. The open mouth and the swollen belly demonstrated quite clearly that he had died drowned by the waters and buried in the mud in which I found him enveloped.

Luigi Settembrini, a friend of Fiorelli and a fellow scholar, published this description in the same newspaper the next day.

And lo and behold, a few days ago, while digging in a small street near the baths, and right in the middle of the street, there were found two pairs of gold earrings—one larger, one smaller—a gold ring, a hundred silver coins, and two iron keys, all in the same spot near a hole that led into a cavity. Fiorelli rushed up and with long tongs dug out some bones from the hole and filled the cavity with liquid gesso [plaster]. When the gesso had hardened and was scraped clean of the ash that adhered to it, it revealed the figure of a man lying on his back, with his mouth open, his chest and stomach swollen, as is usually seen in those who have drowned. The left arm was complete, extended, with the hand closed. At the tips of the fingers, the bones could be seen in the gesso. On the small finger, there was an iron ring. The right arm was missing because it was where the hole was through which the gesso had entered. On the left arm and on the chest is a certain accretion, which appears to be made by the clothing. The belly is bare. The trousers are rolled down over the thighs. On the feet were laced soles, and nails were visible on the bottoms. From the straps that wrapped the left foot, the large toe extended bare. He appeared to be a man of fifty years. The nose and the cheeks could be seen clearly. The eyes were missing, as was the hair. In the open mouth, he was missing some teeth. Here and there appears clothing material.

Name _____

Class _____

Date _____

For #1-5, compare details in the two descriptions of how the first plaster cast was made at Pompeii in 1863. Complete the chart with text from the primary sources. Then, answer the questions that follow.

	Fiorelli	Settembrini
1. Location	"in the small street that begins opposite one of the secondary doors of the Stabian Baths and issues in the vicinity of the Building of Eumachia"	
2. Artifacts found		"found two pairs of gold earrings—one larger, one smaller—a gold ring, a hundred silver coins, and two iron keys"
3. Term for the liquid plaster		
4. Description of man's shoes		"laced soles, and nails were visible on the bottom...straps that wrapped the left foot"
5. Description of the man's face	"open mouth"	



Name _____

Class _____

Date _____

6. (a.) Which author gave a more detailed description of the setting and the objects found with the body? (b.) Which author gave a more detailed description of the victim's body?

7. What was removed from the hole before the plaster was poured?

8. Before Fiorelli's work in Pompeii, some historians disagreed on whether ancient Roman men wore pants or, if they did, when pants became fashionable. How does the clothing revealed in this cast answer those questions?

9. According to both Fiorelli and Settembrini the cast of the man was missing part of his right side. What reason does Settembrini give for the missing right arm?

10. How do both men think this victim die?



Name _____

Class _____

Date _____

11. (a.) How old was the victim when he died? (b.) Which author provides the man's age in his description? (c.) Do you think the age the author gives for the victim correct?

12. The plaster cast of this man and of other Pompeiians show some people wearing layers of warm clothing. Fiorelli described him as "wrapped in a cloak." The accepted date for Vesuvius' eruption has always been August 24th, but some scholars believe it actually happened in October or November. (a.) Which season does the clothing discovered in the casts support and why? (b.) Some of the artifacts you see in Pompeii: The Exhibition can also be used as clues to help solve this mystery. Explain how carbonized foods and coins could help determine what time of year Vesuvius erupted—summer or fall.



HIGH SCHOOL

SOCIAL STUDIES, LANGUAGE ARTS, SCIENCE
History, Primary Source, Literacy, Earth Science

HIGH SCHOOL LESSON PLAN 1: PLINY'S POINT OF VIEW

Teacher Instructions

By 79 A.D., Pompeii was an ancient city with a thriving commercial center. Long before Vesuvius froze everything in time, centuries of carts rolling by carved deep ruts in the stone streets—and they are still visible today. Pompeii and its neighboring towns were home to thousands of people, from the wealthiest Roman citizens to the poorest slaves. Their places in society meant nothing, however, the day Vesuvius erupted.

Some settlements buried by the eruption in 79 A.D. are still unexcavated and, with little written record available, it is difficult to know how many people escaped the destruction from Vesuvius. There was a brief window of time in the hours between when the volcano showered the area with ash, pumice, and stone in the early afternoon and when the super-heated pyroclastic surges rolled down the mountain early the next morning.

Many people left right away either on one of the roads leading away from the city or by boat, through the Bay of Naples. Others stayed, thinking it would be better to hide out in their homes or shops until the rain of debris ended. They did not know that by the next day, even without the waves of heated gases and ash obliterating everything in their path, all signs of civilization would be buried under several meters of volcanic deposits. Within 48 hours, Pompeii was transformed forever by the catastrophic eruption of Mount Vesuvius.

The remains of those who stayed behind or tried to leave too late help us understand first-century life in Pompeii. Some of these are the people whose body casts and possessions you and your students see in Pompeii: The Exhibition. Little is known about what became of the people who escaped Vesuvius' destruction nor exactly what they experienced that day. Even though the eruption could be seen for hundreds of miles, there is only one surviving primary source describing what happened, a pair of letters written by Pliny the Younger.

Pliny the Younger was 18 years old when Vesuvius erupted. He lived with his mother and uncle, Pliny the Elder, in Misenum. Pliny the Elder was an officer in the imperial Roman army, stationed there with the naval fleet. Misenum was located across the Bay of Naples from Pompeii and provided an excellent view of Mount Vesuvius. A few years after the eruption, Pliny the Younger wrote to his friend Tacitus, a historian, and described what it looked like from afar, how his uncle tried to rescue people, and what he and his mother did as the scope of the disaster became apparent.

Many of the basic facts of the golden age of the Roman Empire and the eruption of Mt. Vesuvius come from Pliny's writings. In the three activities below, your students will read, analyze, and re-create Pliny's words for themselves.



HIGH SCHOOL

SOCIAL STUDIES, LANGUAGE ARTS, SCIENCE
History, Primary Source, Literacy, Earth Science

ANSWER KEY

Part 1

1. No, because of the distance
2. A tree, "an umbrella pine"
3. "the amount of soil and ashes it carried with it"
4. Answers will vary but should mention it being based on Pliny's description of the eruption
5. He preferred to go on with his studies
6. Rectina, the wife of his friend Tascus. She asked Pliny to come rescue her
7. She lived at the foot of the mountain
8. Yes, "this lovely stretch of coast was thickly populated"
9. ashes, pumice, and blackened stones
10. it was blocked by debris from the mountain

Part 2

Answers will vary, but there should be 10 tweets, with 140 characters each, for each event in the timeline.

Part 3

Answers will vary, but should include at least three aspects the two tragedies have in common.



PLINY'S POINT OF VIEW

Student Activity

By 79 A.D., Pompeii was an ancient city with a thriving commercial center. Long before Vesuvius froze everything in time, centuries of carts rolling by had carved deep ruts in the stone streets—and they are still visible today. Pompeii and its neighboring towns were home to thousands of people, from the wealthiest Roman citizens to the poorest slaves. Their places in society meant nothing, however, the day Vesuvius erupted.

Some settlements buried by the eruption in 79 A.D. are still unexcavated and, with little written record available, it is difficult to know how many people escaped the destruction from Vesuvius. There was a brief window of time in the hours between when the volcano showered the area with ash, pumice, and stone in the early afternoon and when the super-heated pyroclastic surges rolled down the mountain early the next morning.

Many people left right away either on one of the roads leading away from the city or by boat, through the Bay of Naples. Others stayed, thinking it would be better to hide out in their homes or shops until the rain of debris ended. They did not know that by the next day, even without the waves of heated gases and ash obliterating everything in their path, all signs of civilization would be buried under several meters of volcanic deposits.



In 79 A.D., Pompeii was a bustling metropolis still recovering from an earthquake in 62 A.D.—a precursor for what was to come 17 years later.

Within 48 hours, Pompeii was transformed forever by the catastrophic eruption of Mount Vesuvius.

The remains of those who stayed behind or tried to leave too late help us understand first-century life in Pompeii. Some of these are the people whose body casts and possessions you see in Pompeii: The Exhibition. But little is known about what became of the people who escaped Vesuvius' destruction nor exactly what they experienced that day. Even though



Pliny the Younger

the eruption could be seen for hundreds of miles, there is only one surviving primary source describing what happened, a pair of letters written by Pliny the Younger.

Pliny the Younger was 18 years old when Vesuvius erupted. He lived with his mother and uncle, Pliny the Elder, in Misenum.

Pliny the Elder was an officer in the imperial Roman army, stationed there with the naval fleet. Misenum was located across the Bay of Naples from Pompeii and provided an excellent view of Mount Vesuvius. A few years after the eruption, Pliny the Younger wrote to his friend Tacitus, a historian, and described what it looked like from afar, how his uncle tried to rescue people, and what he and his mother did as the scope of the disaster became apparent.

Many of the basic facts of the golden age of the Roman Empire and the eruption of Mt. Vesuvius as you experience in Pompeii: The Exhibition come from Pliny's writings. In the activities below, you will read, analyze, and re-create Pliny's words for yourself.

Terms to Know: acumen, borne, dispersed, implore, lapilli, pumice, porous, pyroclastic, seismic, subside, villa

POMPEII
THE EXHIBITION

Part 1

Read the excerpt below in which Pliny describes the eruption and then answer the 10 questions that follow.

It was not clear at that distance from which mountain the cloud was rising (it was afterwards known to be Vesuvius); its general appearance can best be expressed as being like an umbrella pine, for it rose to a great height on a sort of trunk and then split off into branches, I imagine because it was thrust upwards by the first blast and then left unsupported as the pressure subsided, or else it was borne down by its own weight so that it spread out and gradually dispersed. In places it looked white, elsewhere blotched and dirty, according to the amount of soil and ashes it carried with it.

My uncle's scholarly acumen saw at once that it was important enough for a closer inspection, and he ordered a boat to be made ready, telling me I could come with him if I wished. I replied that I preferred to go on with my studies, and as it happened he had himself given me some writing to do. As he was leaving the house he was handed a message from Rectina, wife of Tascus [a friend], whose house was at the foot of the mountain, so that escape was impossible except by boat. She was terrified by the danger threatening her and implored him to rescue her from her fate. ... He gave orders for the warships to be launched and went on board himself with the intention of bringing help to many more people besides Rectina, for this lovely stretch of coast was thickly populated.

He hurried to the place which everyone else was hastily leaving, steering his course straight for the danger zone. ... Ashes were already falling, hotter and thicker as the ships drew near, followed by bits of pumice and blackened stones, charred and cracked by the flames: then suddenly they were in shallow water, and the shore was blocked by the debris from the mountain....

1. At first, was Pliny able to tell which mountain was erupting? Why or why not?

2. To what does Pliny compare the shape of the cloud from the eruption?

3. Why do you think volcanic eruptions similar to Vesuvius' in 79 A.D. are often called "Plinian" by scientists?

4. What determined the color of the cloud?

Name _____

Class _____

Date _____

5. Pliny the Elder did not survive the disaster, but Pliny the Younger does. Why did Pliny the Younger remain at Misenum instead of accompanying his uncle?

6. Who sent Pliny's uncle a letter? Why?

7. Where did Rectina?

8. *Were there many people living on the coast near Vesuvius?*

9. *What three things were falling from the sky?*

10. *Why were the ships unable to reach the shore?*



Part 2

Below is the approximate timeline of the eruption of Mt. Vesuvius, including excerpts from Pliny's letters. After you have read through the 10 entries below, recreate the timeline on separate paper as a series of posts Pliny the Younger might have put on Twitter. Remember, tweets are limited to 140 characters!

24 August A.D. 79

8 a.m.: A series of small emissions from Mt. Vesuvius.

"For several days past there had been earth tremors which were not particularly alarming because they are frequent in Campania; but that night the shocks were so violent that everything felt as if were not only shaken but overturned. "

1 p.m.: Mt. Vesuvius erupts suddenly and with great force. A cloud of volcanic materials soars high above the mountain, spreading out in the shape of a flat-topped pine tree. Within 30 minutes, the surging dark cloud rises some 14 km above Mt. Vesuvius. Ash drifts over Pompeii.

"...being like an umbrella pine, for it rose to a great height on a sort of trunk and then split off into branches... "

3 p.m.: Mt. Vesuvius spews its contents higher and higher. As it rises, the volcanic material (mostly fragments of lapilli) cools and hails down on Pompeii. Most residents flee, although some seek shelter or stay behind to guard their property. Volcanic debris begins to clog the Sarno River and the port, making them impassable to ships. Seismic shockwaves shake the area.

"...there was a danger from falling pumice stones ...as a protection against falling objects they put pillows on their heads tied down with cloths... We also saw the sea sucked away...so that quantities of sea creatures were left stranded on dry sand. "

5 – 6 p.m.: Chunks of pumice, as big as 50cm, plummet from the cloud. Streets and roads are buried deep under the accumulated pumice, lapilli and ash, and the roofs of buildings begin to collapse under the weight. The dense cloud now rises about 25km above Mt. Vesuvius, obliterating the sun. Darkness, broken only by flashes of lightning, adds to the terror of fleeing inhabitants.



The village of Misenum was far enough from the volcano to avoid destruction, but close enough for Pliny the Younger to witness the eruption.



25 August A.D. 79

1 – 2 a.m.: Scalding mudflows of volcanic debris mixed with steam spill from the volcano and down the slopes, choking the town of Herculaneum. Ash, lapilli, and pumice continue to rain down on Pompeii; the debris is now as high as the upper floors of buildings. It bursts through windows, doors, and roofs, trapping and suffocating those hiding within.

“Soon great flames and vast fires shone from many points on Mt. Vesuvius; the gleam and light made more vivid by the night time shadows.”

4 a.m.: The volcanic plume above Mt. Vesuvius, now 30 km high, grows too heavy and begins to collapse. The column cascades to Earth, sending superheated ash and gases roaring in turbulent waves, called pyroclastic flows, down the volcano’s slopes. The first flow reaches Herculaneum, killing any inhabitants who still remained.

5 a.m.: Strong earthquakes continue to shake the whole area. A second, even hotter surge further buries Herculaneum. At Pompeii, the rain of pumice eases, but darkness prevails as the massive ash cloud hides the rising sun. Some survivors try to flee their hiding places and escape the town. But it is hard to breathe in the ash-clogged air, or to walk – or even crawl – over the deep layer of volcanic fallout.

“We were followed by a panic-stricken mob of people wanting to act on someone else’s decision.”

6:30 a.m.: The third pyroclastic surge, the strongest yet, reaches Pompeii from the north but is held back by the town’s wall.

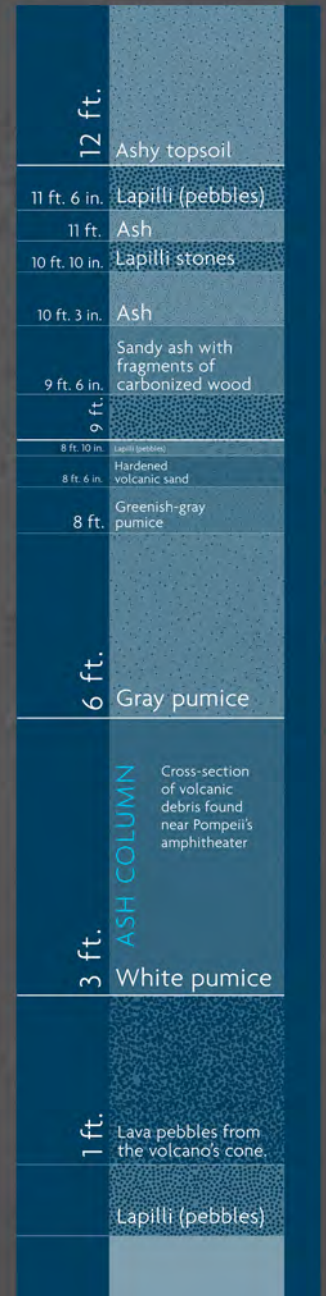
6.30 – 7:30 a.m.: Powerful surges overcome the walls and sweep over the town in massive waves of toxic gas and burning, smothering ash. Pompeii’s remaining inhabitants are killed instantly and the city is buried. Most people who die at Pompeii perish in this phase of the eruption.

“...my mother implored...me to escape...I refused to save myself without her, and grasping her hand forced her to quicken her pace.”

8 a.m.: The most destructive surge hits Pompeii, preceded by a storm of fire and lightning. The town’s tallest structures are burned, toppled, and buried. The same surge reaches Stabiae and even as far as Naples. Luckily for Pliny the Younger, the surge loses momentum before it reaches Misenum, though the town is engulfed in a dense cloud of ash. Volcanic activity, electrical storms, and mudslides continue for several days. By the time the eruption ends, the summit of Mt. Vesuvius has collapsed, leaving a crater 200m lower. The entire region is annihilated — towns, vegetation, livestock, people. Only the tops of the highest walls remain unburied to show where Pompeii stood.

“Finally, the cloud lifted and vanished in a sort of smoke or fog...the sun even reappeared, but pale, as when there is an eclipse...the landscape looked changed and covered by a thick blanket of ash, as if it had snowed.”

ASH COLUMN



Pliny the Younger's description of the volcanic materials created by the eruption matches what scientists have found in the ash column.



Part 3

Read the selection below by Pliny in which he explains what his mother and he did after the eruption. Next, write a brief essay comparing Pliny's experience to the moments following the destruction of the Twin Towers in New York City on 9/11/01. Although they are separated by centuries and continents, what do these two events have in common? Your written account should include at least three comparisons.

You will find first-hand accounts of 9/11 here:

- September 11 News www.september11news.com/USAWebArchives.htm
- The September 11 Digital Archive www.911digitalarchive.org
- TeachersFirst: September 11 Resources www.teachersfirst.com/spectopics/september.cfm

Ashes were already falling, not as yet very thickly. I looked round: a dense black cloud was coming up behind us, spreading over the Earth like a flood. 'Let us leave the road while we can still see,' I said, 'or we shall be knocked down and trampled underfoot in the dark by the crowd behind.' We had scarcely sat down to rest when darkness fell, not the dark of a moonless or cloudy night, but as if the lamp had been put out in a closed room.

You could hear the shrieks of women, the wailing of infants, and the shouting of men; some were calling their parents, others their children or their wives, trying to recognize them by their voices. People bewailed their own fate or that of their relatives, and there were some who prayed for death in their terror of dying. Many besought the aid of the gods, but still more imagined there were no gods left, and that the universe was plunged into eternal darkness for evermore.

There were people, too, who added to the real perils by inventing fictitious dangers: some reported that part of Misenum had collapsed or another part was on fire, and though their tales were false they found others to believe them. A gleam of light returned, but we took this to be a warning of the approaching flames rather than daylight. However, the flames remained some distance off; then darkness came on once more and ashes began to fall again, this time in heavy showers. We rose from time to time and shook them off; otherwise, we should have been buried and crushed beneath their weight.



HIGH SCHOOL

MATHEMATICS, SOCIAL STUDIES
Geometry, History, Geography

High School Lesson Plan 2: Business in Pompeii

Teacher Instructions

Units of measurement in ancient Rome were consistent throughout the Empire. In fact, the *Mensa Ponderaria*, the public office that regulated weights and measures, was located near the market in Pompeii. To prevent merchants from cheating customers and suppliers, they had to check their weights and measuring devices against official samples. The main Roman unit of weight, the *libra*, weighed 12 *unicae*—roughly 12 ounces. The abbreviation we use today for a pound (lb.) is derived from *libra*. The *pes*, equivalent to about 11.6 inches, was used to measure length. *Pes* is the Latin word for foot, so you can see how our modern-day measurement of a foot got its name.

Liquids were measured in a uniquely-shaped pottery container called an amphora. Each amphora could hold one cubic *pes*, or about seven gallons of liquid. Amphorae (the plural of amphora) were used to transport and store wine, oil, soup, and other commodities. The tapered bottom of the amphora allowed it to be set upright securely in sand or dirt or fit into slots and holes in counters at shops and restaurants.

With an excellent climate and fertile growing season, Pompeii was renowned for its vineyards. One of the

amphora you see in Pompeii: The Exhibition once held wine. Hundreds of amphorae survived the eruption, as did other containers made of terra cotta, glass, and bronze. In Part 1 below, students will use geometric formulas to calculate the volumes of some of the historic vessels seen first-hand on your field trip. The source for the figures provided in question #4 is *Life, Death, and Entertainment in the Roman Empire* edited by D.S. Potter and D.J. Mattingly (University of Michigan Press, 1999).

By 79 A.D., Pompeii was a sophisticated town with a noisy, thriving center of business. Local *garum* (a fish sauce), olive oils, wines, and millstones cut from volcanic rock were shipped from Pompeii to the far corners of the Roman Empire. City merchants imported lamps from northern Italy, pottery from Gaul, and oil and wines from Spain, Sicily, and Crete. The thriving import/export trade supported many successful enterprises including bakeries, textile workshops, bars, and restaurants. In the second activity, your class will be challenged to design a blueprint for an *insula*, a block in a Roman city plan, featuring businesses and buildings excavated in Pompeii.



HIGH SCHOOL

MATHEMATICS, SOCIAL STUDIES
Geometry, History, Geography

Answer Key

Part 1

1. 4734.59 in³
2. 720.97 in³
3. 5674.31 in³
4. (a.) 70 liters/amphora; (b.) 25 liters/amphora; (c.) oil
5. Because the objects are irregularly shaped and not perfect cylinders
6. 43.57 in³; answers will vary but should be consistent with something along the lines of a soup or cereal bowl

Part 2

There are 18 locations or businesses on the list. Assess students' work based on how many of the 18 they included in their designs.



BUSINESS IN POMPEII

Student Activity

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With an excellent climate and fertile growing season, Pompeii was renowned for its vineyards. One of the amphora you see in Pompeii: The Exhibition once held wine. Hundreds of amphorae survived the eruption, as did other containers made of terra cotta, glass, and bronze. In Part 1 below, you will use geometric formulas to calculate the volumes of some of the historic vessels you see first-hand on your field trip.

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Oil amphora



The glirarium was used to raise edible dormice. The cage has spiral shelves on the interior, two food tanks, and multiple air holes. These conditions urged dormice to hibernate in captivity where they fattened up until they became a savory and luxurious snack.



The garum amphora has a distinctive pear-shape and elongated base. Typically, the name of the merchant was painted on the side of the container.

Terms to Know: barracks, commodities, dormouse, fermented, granaries, hemisphere, piazza, tannery, tiers, vessel

POMPEII
THE EXHIBITION

Part 1: Measure Up

The formula for the volume of a right cylinder ($V = \pi r^2 h$) can be used to model the amount of liquid held in the amphorae and other containers you see during your field trip.

1. The oil amphora featured in *Pompeii: The Exhibition* is 34.65 inches high and has a diameter of 13.19 inches. What is its volume?

2. Another amphora you will see at *Pompeii: The Exhibition* was for garum, a sauce made from the fermented, crushed, and salted intestines of fresh fish such as tuna and moray eels. The owner of one of the largest and most beautiful villas in Pompeii, Asulus Umbricius Scaurus, amassed his great fortune from producing and selling it. Garum amphorae were smaller than those used for wine and oils. Calculate the volume of the garum amphora you see at *Pompeii: The Exhibition* which is 23.5 inches high with a diameter of 6.25 inches.

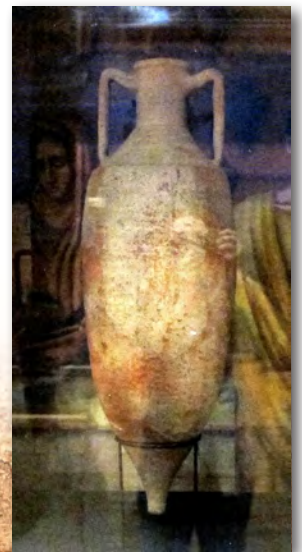
3. An unusual cylindrical object found in the kitchens of Pompeii is the glirarium. This container was used to raise edible dormice, considered to be a delicacy for wealthy Roman families. The glirarium in the Kitchen gallery of *Pompeii: The Exhibition* is 19.5 inches in diameter and 19 inches tall. What is its volume?

4. One historian estimated that a year's supply of oil for just the city of Rome would be about 20,000,000 liters, or 285,714 amphorae. For wine, 100,000,000 liters of wine would require 4,000,000 amphorae.
 (a.) How many liters did these oil amphorae hold? (b.) How many liters did the wine amphorae hold?
 (c.) Which one, oil or wine, was held in a larger amphora?

5. Look at the images of the amphorae from *Pompeii: The Exhibition*. Why does using the formula for volume of cylinder only provide an approximation for the volumes of these containers and not a precise amount?

6. The formula for the volume of a hemisphere ($V = \frac{2}{3}\pi r^3$) can be used to measure the cups, bowls, and glasses uncovered in Pompeii. Calculate the volume for the glass dish on display in the Triclinium gallery. It is 5.5 inches in diameter. Based on its size, for what do you think this object could have been used?

Amphorae like this one were used to transport and store wine.



POMPEII
THE EXHIBITION

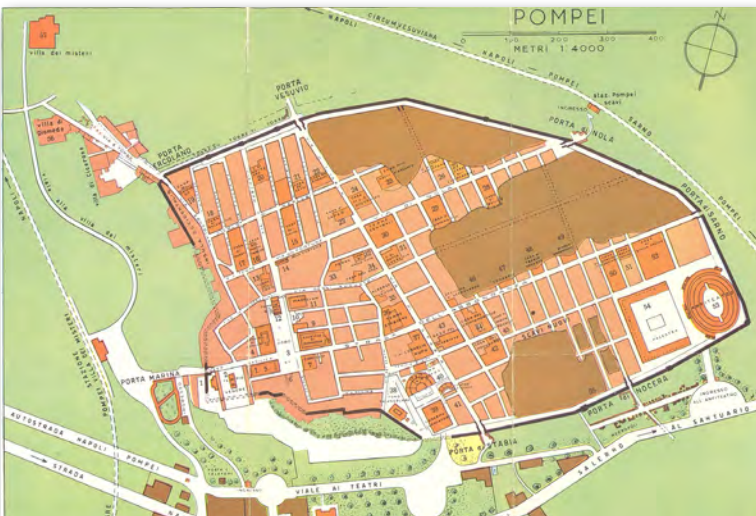


Pompeii had two theaters, one larger than the other. Both were circular with banked tiers to maximize sound quality.

Part 2: Design Challenge

The Forum was the commercial and social center of all Roman cities. Administrative and religious public buildings surrounded a piazza where public events and ceremonies were held. In Pompeii, the city hall, legal courts, and offices sat on the south side of the Forum. Food markets, including the fish market and the weights and measures office, lined the west side.

Based on the public buildings and professions listed below, design the layout for your city center on separate paper. Your insula should be anchored by the Forum and include as many of the businesses and buildings on this list below. Incorporating all of them on your blueprint will earn a perfect score! Use the map of Pompeii's streets as a guideline for your design.



Map of Pompeii



This small box was used to store medicines, organized by category in different compartments. The Romans developed many medical procedures and tools, including surgical instruments, that are still used today.

Part 2: Design Challenge

Temple: the Temple of Jupiter was the main temple in Pompeii, although others have been identified for Apollo, Isis, and Venus

Amphitheater: the site of gladiator battles; the amphitheater at Pompeii had a capacity of 20,000—a huge number of people in ancient times

Public baths: Pompeii had at least four throughout the city

Theatres: the Odeon was a small theatre with a roof; Pompeii also had a larger, outdoor theater next to the Odeon

Basilica: a large building for business transactions and legal matters

Gladiatorial barracks: the gladiators, Pompeii's elite athletes, were housed and trained together, where they received the best healthcare and finest foods

Macellum: an indoor marketplace; located by the Forum in Pompeii

Pistrinium: bakery

Fullonica: laundry

Officina coriariorum: tannery

Thermopolia: cafés or snack bars; Pompeii alone had almost 200 thermopolia

Caupona: small restaurants, or inns and taverns, that served hot meals

Palaestra: gymnasium; the one in Pompeii included a natatorium (swimming pool)

Mensa Ponderaria: the official office for standardizing weights and measures

Horrea: public warehouses and granaries

Negotiator aeriarius: merchant dealing in metalworks, like a coppersmith or bronzesmith

Chirurgus: surgeon; the surgeon would have most likely performed his medical duties in an area of his own domus, or home

Argentarius: banker; archaeologists identified the house of one of Pompeii's bankers, Lucius Caecilius Lucundus, who also conducted business from his domus



The highest concentration of bakeries in Pompeii were east of the Forum. Archaeologists discovered carbonized bread inside the oven of one pistrinum.



The Forum was the commercial and social center of all Roman cities. Administrative and religious public buildings surrounded a piazza where public events and ceremonies were held.

WHAT YOUR STUDENTS WANT TO KNOW

Teachers: Use this FAQ to prepare your students for their field trip to *Pompeii: The Exhibition*. It can also serve as a “Before and After” review of their knowledge of this catastrophic time in ancient Pompeii.

When did Vesuvius erupt and destroy Pompeii?

Mount Vesuvius erupted on August 24, 79 A.D., and sent a cloud of ashes, pumice stones, and smoldering hot volcanic gases high into the sky. People could see the eruptions for hundreds of miles. The debris made its way down to Earth as it began to cool. The volcano was dormant for generations and caught the ancient Romans off-guard.

When was Pompeii rediscovered, who discovered it, and how was it discovered?

Local inhabitants had long been aware of antiquities buried in their midst. Well diggers at Herculaneum, not far from Pompeii, discovered the theater of that city in 1738. A decade later attention shifted to Pompeii, which was not so deeply buried and more easily excavated. The ruins of the city had previously been accidentally encountered in 1592 by engineers digging a canal, but they were not interested in the antiquities and continued with their project, leaving the ancient city relatively untouched.

What happened when the volcano exploded?

Days before the eruption, frequent tremors shook Pompeii and surrounding cities. Shortly before noon the volcano erupted. People heard explosions coming from the mountain as hot ash and gas began to surface. By 1pm the dust and ash had completely covered the sky creating utter darkness. By 8pm, the eruptions had grown more violent creating the heavy debris of falling ash and pumice that buried Pompeii and its neighboring cities, Herculaneum and Stabiae.

Eruptions and earthquakes continued into the next day (August 25, 79 AD). That morning, the largest pyroclastic flows of hot ashes, volcanic gases, and debris made their way through the streets of Pompeii completely destroying the city. In just two minutes, the city streets were covered in almost eight feet of hot ash. On the morning of August 26, 79 A.D. the eruption finally stopped, leaving almost five cubic miles of pumice and ash covering approximately 186 miles of land.

How long did people have to leave the city before it was destroyed?

Most Pompeiians did not know the destruction foreshadowed by the earthquakes that took place days before the eruption. With the eruption occurring around noon and growing more violent by that evening, it is believed that the residents of Pompeii only had a few hours to evacuate the city.



Why did some people choose not to evacuate?

For many residents, tremors and earthquakes happened so frequently that they didn't pay much attention to them. Additionally, as there wasn't a word for volcano, the people of Pompeii did not view the tremors as potential warning signs. Some residents sought the aid of gods, others felt it was a sign from the gods that they were going to destroy everyone, and still others believed no gods were left and the universe was being thrust into eternal darkness.

How was the city preserved?

The large amount of ash that covered the city acted as a preservative, leaving the city of Pompeii almost exactly how it had been left 1600 years before it was discovered.

Why did Pompeii remain undiscovered for so long?

Due to the miles of ash and pumice that covered the city, as well as the first-hand accounts of the event and unsuccessful rescue attempts, Pompeii was thought to be lost forever.

How many people died during the eruption?

It is believed that more than 2,000 people lost their lives as a result of the destructive eruption.

What is the present status of Pompeii?

Today Pompeii has been designated as World Heritage Site by UNESCO attracting more than 2.6 million tourists annually. Though sections of it are currently visible to tourists, much of the city remains protected due to the moratorium on future excavation so that the already exposed buildings can be studied, conserved, and preserved.



REDISCOVERY TIMELINE

The story of the rediscovery of Pompeii, Herculaneum, and other communities buried by the eruption of Mt. Vesuvius is as fascinating as the story of the towns themselves. Use this detailed timeline of significant moments in the archaeology of Pompeii to incorporate the history of this cataclysmic event into your daily lesson plans. These milestones are connected to the wide variety of themes, people, and topics featured in both this Educator Guide and within the galleries at *Pompeii: The Exhibition*.

This information can be used in your classroom:

- For exercises in historical geography, by mapping specific locations over time.
- As a resource for biographies of key people involved in the rediscovery of Pompeii.
- To develop group study aids such as trivia contests and game or quiz shows.
- As writing prompts and research project topics across the curriculum.
- To study the evolution of technology and methodology in the fields of archaeology and history.

1709-1711: A farmer sinking a well struck Herculaneum's ancient theater in which he found handsome ancient marble sculptures. An Austrian general acquired the land, had deep tunnels dug, and for two years plundered the site for antiquities.

1738: Employing miners, soldiers and convicts, Charles I, the 22-year-old representative of a brand new Tuscan-Spanish dynasty installed in the Kingdom of Naples and Sicily, launched a treasure hunt at Herculaneum. Hundreds of sculptures, columns and frescoes were hacked from walls and removed.

1740: Originally thought to be the city of Stabiae, it was later discovered that the buried city was Pompeii. The city was crudely plundered after excavations began. For decades, there was no attempt to record or preserve the site and countless objects were destroyed. The finest frescoes and artifacts went into the royal collection, which is currently housed in the National Archaeological Museum of Naples.

1750-1764: Karl Weber, a Swiss army engineer, directs excavations at Herculaneum and Pompeii. He is the first to conduct systematic digs and to record uncovering of the sites.

1760: The first person to attempt a methodical approach to cataloging the ruins at Pompeii was German art historian, J.J. Winckelmann. He is considered to be the father of archaeology. Because the city was buried under a shallow layer of lightweight pyroclastic matter, it was possible, and a priority, to conduct a speedy excavation in order to limit the number of thefts.

1765: Excavations at Herculaneum were suspended after the Temple of Isis is discovered at Pompeii.

1805-1815: Coming under French rule, the kingdom of Naples is run by Napoleon's sister and brother-in-law. Thanks to Queen Caroline Bonaparte Murat's keen interest in archaeology, French architects excavated and surveyed Pompeii and discovered the forum.

1817: Sir William Gell, living in Naples, published *Pompeiana*, the first English guidebook on Pompeii. New editions were printed for decades.



POMPEII
THE EXHIBITION

1830-1832: The Alexander Mosaic, circa 100 BCE, was discovered during an excavation of the House of the Faun. The complex floor mosaic, 19 feet by 10 feet – a copy of a famous earlier Macedonian fresco or painting – depicted young Alexander’s victory over Darius, King of Persia.

1860-1875: The archaeologist Giuseppe Fiorelli, director of excavations at Pompeii for a newly unified Italy, introduced innovative methods of discovery. Frescoes were no longer removed from walls and sent to the Naples museum but were left in place. Fiorelli cleared the streets of debris and systematically numbered the streets and buildings. From hollows left by decaying organic matter, he made plaster casts that reconstructed bodies of dead people and also those of animals and native trees.

1879: Official ceremonies marked the 1800th anniversary of Pompeii’s destruction. Fiorelli’s successor, the archaeologist Michele Ruggiero, continued to preserve and restore Pompeii’s original appearance.

1910-1923: Archaeologists focused on clearing Pompeii’s main street, the Street of Abundance (Via dell’Abbondanza), and restoring every excavated building along its path.

1924-1930: After Giuseppe Fiorelli, Amedeo Maiuri became the single most influential superintendent of excavations at Pompeii. He re-launched excavations after they were halted for 162 years, fearing encroaching construction above ground.

1935-1939: The Large Palestra (gymnasium) near the amphitheater was fully excavated and restored. Many bodies were found in the portico.

1943-1944: During World War II, Allied bombs fell on Pompeii, striking several houses in the Street of Abundance (Via dell’Abbondanza). Vesuvius also erupted for several months and parts of Naples were evacuated.

1940-1960: Volcanic rubble was in great demand for road-building – excavation records for this period were extremely poor or non-existent.

1980: Pompeii was damaged by a severe earthquake in November. Documentation of existing ruins became a priority in anticipation of future quakes.

1997: Pompeii, Herculaneum and associated sites were declared a World Heritage Site by UNESCO, the United Nations Educational, Scientific, and Cultural Organization.

2010: The National Archaeological Museum of Naples opened a new wing, dedicated to displaying paintings from the Vesuvian sites. Some of the freshly restored paintings were on view for the first time in decades.

Late 2010: Torrential rains reduced two houses in Pompeii to rubble. The House of the Gladiators had been given an overly-heavy cement roof over 60 years prior, and the House of the Moralist rested against a man-made embankment that collapsed.

Today: Pompeii takes up a quarter of a square mile. Large-scale excavation has now ceased, and one-third of the city remains underground. Archaeologists oppose undertaking fresh excavations while they focus on conserving existing buildings, re-examining and understanding earlier discoveries, and researching the pre-Roman settlement of Pompeii.



VOLCANIC VOCABULARY

Provide an area in your classroom with dictionaries – online or hard copies – for your students to define the terms below. For additional vocabulary development, refer to the word bank (“Terms to Know”) listed on the Student Activity pages in the lesson plans.

Archaeologist

A scientist who studies artifacts of the near and distant past in order to develop a picture of how people lived in earlier cultures and societies. These artifacts include physical remains, such as graves, tools and pottery.

Artifact

A handmade object or the remains of an object that is characteristic of an earlier time or culture, such as an object found at an archaeological excavation.

Caldera

A cauldron-like depression in the ground created by the collapse of land after a volcanic eruption.

Cinder Cone Volcano

A type of volcano, also known as a scoria cone, which has a single vent, a bowl-shaped crater, and steep sides (i.e. Paricutin).

Composite Volcano

A type of volcano, also known as a stratovolcano, which is usually tall and mountainous and whose steep sides have been formed over time by repeated deposits of ash, lapilli, lava, and pyroclastic flows (i.e. Vesuvius).

Convergent Plate Boundaries

Locations where lithospheric plates are moving towards one another. These plate collisions often produce earthquakes, volcanic activity, and crustal deformation.

Cryovolcano

Also known as an ice volcano, these types of volcanoes erupt volatiles such as water, ammonia, and methane instead of molten rock.

Dormant

In a state of rest or inactivity; inoperative; (of a volcano) not erupting.

Excavation

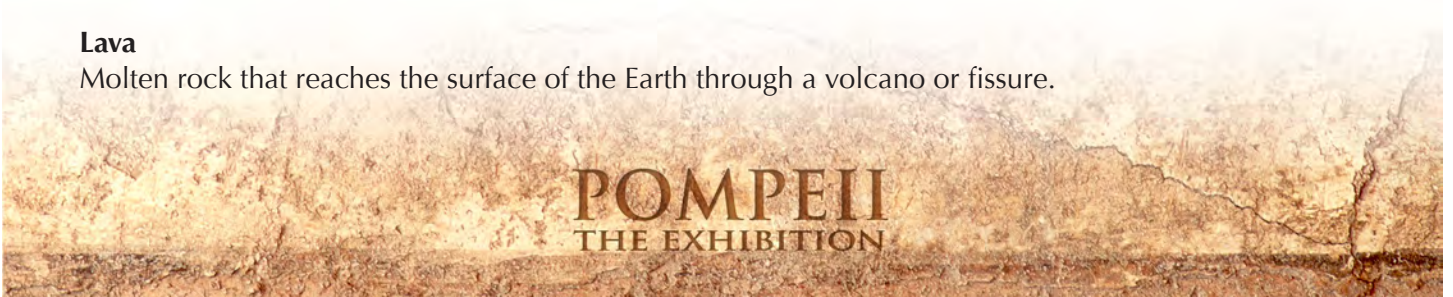
To unearth or remove objects, bodies, buildings, etc. from the environment or site in which they were originally buried.

Flank

The side of a volcano.

Lava

Molten rock that reaches the surface of the Earth through a volcano or fissure.



Lithosphere

The rigid outer shell of the Earth that includes the crust and a portion of the upper mantle.

Magma

Molten material beneath or within the crust of the Earth from which igneous rock is formed.

Magmatic Dike

An intrusive, igneous body that cross-cuts pre-existing rock.

Mosaics

The art of creating images with an assemblage of small pieces of colored glass, stone, or other materials.

Plinian Eruption

A type of volcanic eruption, also known as a Vesuvian eruption, marked by columns of gas and volcanic ash extending high into the stratosphere and characterized by large amounts of pumice and very powerful continuous gas blast eruptions. This type of eruption was named after Pliny the Younger, a Roman writer who escaped Pompeii and described the 79 A.D. eruption of Mt. Vesuvius, which killed his uncle.

Parasitic Cone

A cone-shaped accumulation of volcanic material formed by eruptions from the fractions on the flanks of a volcano, but not part of the central vent.

Pyroclastic Flow

A heavier-than-air emulsion of hot ash, pumice, rock fragments, and volcanic gas that flows down the flank of a volcanic structure. Pyroclastic flows are considered to be the deadliest of all volcanic phenomena.

Shield Volcano

A type of massive volcano with broad sloping sides often built up from the sea floor and formed almost entirely by lava flows (i.e. Mt. Kilauea).

Subduction

The process that takes place at convergent plate boundaries by which one tectonic plate moves under another tectonic plate, sinking into the Earth's mantle as the plates converge.

Subterranean

Existing, situated, or operating below the surface of the Earth; underground.

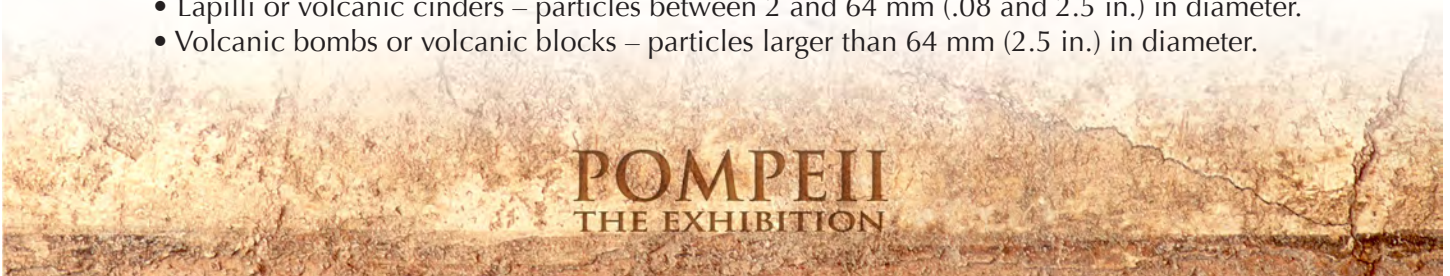
Stratovolcano

See Composite Volcano

Tephra

Material produced and ejected into the atmosphere by a volcano and classified by size:

- Ash - particles smaller than 2 mm (.08 in.) in diameter.
- Lapilli or volcanic cinders – particles between 2 and 64 mm (.08 and 2.5 in.) in diameter.
- Volcanic bombs or volcanic blocks – particles larger than 64 mm (2.5 in.) in diameter.



Tremors

A relatively minor seismic shaking or vibrating movement. Tremors often precede larger earthquakes or volcanic eruptions.

Vent

An opening exposed on the Earth's surface where volcanic material is emitted.

Volcano

An opening or rupture in a planet's surface or crust allowing hot magma, volcanic ash, and gases to escape from below the surface.

Volcanology

The study of volcanoes, lava, magma, and related geological, geophysical, and geochemical phenomena.

Volcanologist

A person who studies the formation of volcanoes and their current and historic eruptions.



BEYOND THE ASHES: CURRICULUM STANDARDS

We know how important it is for you to justify field trips and document how instructional time is spent outside of your classroom. With this in mind, both the activities in this Educator Guide and the experiences your students have during their field trip to Pompeii: The Exhibition are correlated to the Common Core State Standards for English Language Arts and Mathematics along with the Next Generation Science Standards, C3 Framework for Social Studies State Standards, and the National Core Arts Standards. The standards are arranged by grade level and content area.

Elementary School

C3 Framework for Social Studies State Standards: D2.Geo.5.3-5, D2.Geo.9.3-5, D2.Geo.10.3-5, D2.His.2.3-5, D2.His.3.3-5, D2.His.9.3-5, D2.His.13.3-5, D2.His.16.3-5, D3.1.3-5, D3.4.3-5

Common Core State Standards for English Language Arts

- Grade 3: CCSS.ELA-Literacy.RI.3.4, CCSS.ELA-Literacy.RI.3.7
- Grade 4: CCSS.ELA-Literacy.RI.4.4, CCSS.ELA-Literacy.RI.4.7
- Grade 5: CCSS.ELA-Literacy.RI.5.4, CCSS.ELA-Literacy.RI.5.7

Common Core State Standards for Mathematics

- Grade 3: CCSS.Math.Content.3.MD.A.2, CCSS.Math.Content.3.MD.B.3
- Grade 4: CCSS.Math.Content.4.MD.A.1, CCSS.Math.Content.4.MD.A.2
- Grade 5: CCSS.Math.Content.5.MD.A.1
- Standards for Mathematical Practice: 1, 2, 4

Next Generation Science Standards: 3-ESS2-1, 3-ESS2-2

National Core Arts Standards

- Grade 3: VA:Cr1.1.3a, VA:Cr1.2.3a, VA:Cr2.1.3a, VA:Cr2.3.3a, VA:Pr5.1.3a, VA:Pr6.1.3a, VA:Re.7.2.3a, VA:Cn10.1.3a
- Grade 4: VA:Cr1.1.4a, VA:Cr1.2.4a, VA:Cr2.1.4a, VA:Re.7.2.4a, VA:Cn10.1.4a, VA:Cn11.1.4a
- Grade 5: VA:Cr1.1.5a, VA:Cr2.1.5a, VA:Cr2.3.5a, VA:Re.7.2.5a

Middle School

C3 Framework for Social Studies State Standards: D1.2.6-8, D2.Geo.1.6-8, D2.Geo.2.6-8, D2.Geo.3.6-8, D2.Geo.4.6-8, D2.Geo.6.6-8, D2.Geo.7.6-8, D2.His.1.6-8, D2.His.3.6-8, D2.His.10.6-8, D2.His.11.6-8

Common Core State Standards for English Language Arts: CCSS.ELA-Literacy.RH.6-8.1, CCSS.ELA-Literacy.RH.6-8.2, CCSS.ELA-Literacy.RH.6-8.3, CCSS.ELA-Literacy.RH.6-8.4, CCSS.ELA-Literacy.RH.6-8.7, CCSS.ELA-Literacy.RST.6-8.3, CCSS.ELA-Literacy.RST.6-8.4, CCSS.ELA-Literacy.RST.6-8.7, CCSS.ELA-Literacy.RST.6-8.9

Common Core State Standards for Mathematics: CCSS.Math.Content.6.EE.C.9, CCSS.Math.Content.6.NS.B.2

Standards for Mathematical Practice: 1, 2, 4

Next Generation Science Standards: MS-ESS2-2, MS-ESS2-3, MS-ESS3-2

National Core Arts Standards: VA: Pr4.1.7a, VA: Cn11.1.7a, VA: Re7.1.8a, VA: Re9.1.8a



High School

C3 Framework for Social Studies State Standards: D1.1.9-12, D1.5.9-12, D2.Eco.4.9-12, D2.Geo.1.9-12, D2.Geo.2.9-12, D2.Geo.4.9-12, D2.Geo.5.9-12, D2.Geo.8.9-12, D2.Geo.12.9-12, D2.His.1.9-12, D2.His.2.9-12, D2.His.8.9-12, D2.His.9.9-12, D2.His.12.9-12, D2.His.16.9-12

Common Core State Standards for English Language Arts:

- Grade 9-10: CCSS.ELA-Literacy.RH.9-10.1, CCSS.ELA-Literacy.RH.9-10.2, CCSS.ELA-Literacy.RH.9-10.3, CCSS.ELA-Literacy.RH.9-10.4, CCSS.ELA-Literacy.RH.9-10.7, CCSS.ELA-Literacy.RH.9-10.9; CCSS.ELA-Literacy.RST.9-10.1, CCSS.ELA-Literacy.RST.9-10.4, CCSS.ELA-Literacy.RST.9-10.6
- Grades 11-12: CCSS.ELA-Literacy.RH.11-12.1, CCSS.ELA-Literacy.RH.11-12.2, CCSS.ELA-Literacy.RH.11-12.3, CCSS.ELA-Literacy.RH.11-12.4, CCSS.ELA-Literacy.RH.11-12.7, CCSS.ELA-Literacy.RH.11-12.9; CCSS.ELA-Literacy.RST.11-12.1, CCSS.ELA-Literacy.RST.11-12.4, CCSS.ELA-Literacy.RST.11-12.6

Common Core State Standards for Mathematics: CCSS.Math.Content.HSG.GMD.A.3, CCSS.Math.Content.HSG.GMD.B.4, CCSS.Math.Content.HSG.MG.A.1, CCSS.Math.Content.HSG.MG.A.3

Standards for Mathematical Practice: 1, 2, 4

Next Generation Science Standards: HS-ESS2-2, HS-ESS3-1

