

episode 5 ► SEE IT FOR YOURSELF



EXPLORE

# Mount St. Helens

with  
Noah Justice

## Study Guide

Enjoy all the DVDs and study guides in this awesome series!



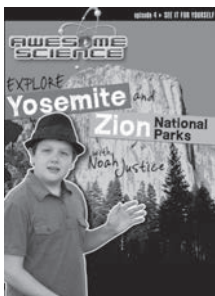
UPC 713438-10215-3  
\$14.99 U.S.



UPC 713438-10216-0  
\$14.99 U.S.



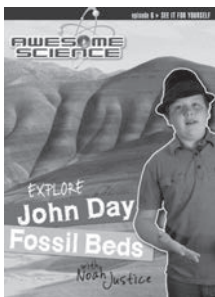
UPC 713438-10217-7  
\$14.99 U.S.



UPC 713438-10218-4  
\$14.99 U.S.



UPC 713438-10219-1  
\$14.99 U.S.



UPC 713438-10220-7  
\$14.99 U.S.

Preview the DVDs at [nlpg.com/awesomescience](http://nlpg.com/awesomescience)



EXPLORE

# Mount St. Helens

with Noah Justice

**STUDY  
GUIDE &  
WORKBOOK**

First Printing: December 2012

Copyright © 2012 by Master Books.® All rights reserved.  
No part of this book may be used or reproduced in any  
manner whatsoever without written permission of the  
publisher, except in the case of brief quotations in articles  
and reviews. For information write:

Master Books®, P.O. Box 726, Green Forest, AR 72638.  
Master Books® is a division of the New Leaf Publishing Group, Inc.

ISBN: 978-0-89051-679-9

Please consider requesting that a copy of this volume be  
purchased by your local library system.

**Printed in the United States of America**

Please visit our website for other great titles:  
[www.masterbooks.net](http://www.masterbooks.net)

For information regarding author interviews, please  
contact the publicity department at (870) 438-5288.



# Contents

Introduction .....	4
About Mount St. Helens .....	6
Ape Cave .....	11
Rapid Strata Formation .....	13
Rapid Erosion .....	18
Lava Cast Forests .....	22
Log and Log Deposits .....	23
Peat and Coal Formation.....	30
Biological Recovery .....	34
Mount St. Helens: Conclusion .....	39

# Introduction

On May 18, 1980, a catastrophic event occurred that has been called by some to be “God’s gift to creationists.”

On a beautiful Sunday morning at 8:32 a.m., Mount St. Helens erupted and caused the largest landslide in modern human history. Then for nine hours it released the explosive power of one atomic bomb every second. Not only was the world shocked by the eruption’s explosive power, but it also challenged the way secular scientists think of how catastrophe (like this one) has shaped the earth.

Never before did scientists — creationist and secular — have such a wonderful, observable laboratory to help explain so many other geologic features around the world by catastrophic processes.

It doesn’t take millions of years to form canyons, stratified layers, and petrified forests. It can happen in only days, weeks, and months, as we saw with the massive eruption of Mount St. Helens.

All this and more on Awesome Science!

## Bonus Activity:

Research the Mount St. Helens eruption online; what were scientists doing before the eruption that helped to document this powerful event?

## Complete Word List

absorption	lava	sedimentary
ash	lupine	sediments
avalanche	magma	softwood
burrowing	magnitude	streams
conifers	methane	summit
crater	mudflow	swamp
deposits	nitrogen	tectonic
design	peat	tidal
elevation	petrified	timberline
erosion	plankton	tube
fissures	pressure	tunnel
floodwaters	pumice	vaporized
formations	pyroclastic	vegetation
geologic	reintroduce	volcanic
glacier	resin	wasteland
hardwood	sandstone	waterlogged
hummocks	scat	wildlife
lahar	scuba	witness
landslide	secular	zone

## Key Concepts

biological recovery	salvation
catastrophism	stratification
ecosystem	subterranean
evolutionary	timescale
hibernation	uniformitarianism
lamination	volcanology
observable	

# About Mount St. Helens

Fill in the blanks with words from the following list:

Toutle	Cascade	active	Flood
Mt. Rainer	tectonic	sixty	dormant
steam	Spirit	virgin	magma
earthquakes	high	British Columbia	

The Pacific Northwest in the United States is an amazing collection of pristine coastland, lush valley farmland, \_\_\_\_\_ desert, and the \_\_\_\_\_ Range.

The Cascade Range stretches from Northern California to southern \_\_\_\_\_. The range was pushed up during the later stages of the \_\_\_\_\_, and contains about a dozen volcanic peaks, averaging about 10,000 feet.

Most of the peaks are thought to have formed not long after the Flood, when the earth was still equalizing from the massive \_\_\_\_\_ shifting.

Eventually much of this volcanic activity slowed down in about 500 years, but a few volcanoes remained \_\_\_\_\_ while others went \_\_\_\_\_.

The recent increase of population centers around these peaks has drawn concern from scientists. The 14,400-foot dormant \_\_\_\_\_ poses a huge threat of catastrophic destruction if it should erupt.

Another dormant volcanic peak was Mount St. Helens in southern Washington State. This area was a pristine scenic

wonderland, with tall and beautiful \_\_\_\_\_ forests, as well as deep blue mountain lakes.

Youth camps and mountain cabins lined the shores of \_\_\_\_\_ Lake and the \_\_\_\_\_ River north of the mountain. For decades, brave mountaineers would climb the 9,677-foot summit for a specular view.

But in March 1980, the mountain started to awaken. At first small \_\_\_\_\_ began to rattle the countryside.

Over the next \_\_\_\_\_ days, there were over 12,000 earthquakes, each increasing in size. Scientists knew the sleeping giant was about to wake up.

Then in early April the first \_\_\_\_\_ explosion penetrated the summit and a hole appeared in the snow. As earthquakes increased, scientists believed that \_\_\_\_\_ was slowly working its way up to the surface.

In early May, a bulge began to appear on the north side of the mountain. It was estimated to be growing at five feet a day. Like a giant balloon, the pressure was growing, and the danger level of a large-scale eruption appeared to be imminent.

On the morning of May 18, 1980, at 8:32 a.m., an earthquake registering 5.1 on the Richter scale signaled the eruption.!

**Please note if the following statements are true (T) or false (F).**

\_\_\_\_ This earthquake caused a giant landslide as one-half of a cubic mile of summit slid north into the valley below, creating 25 square miles of new landscape.

- \_\_\_ The avalanche did not contain rock, snow, or glaciers.
- \_\_\_ When the landslide slid off Mount St. Helens, three-fourths of it went into the Toutle River Valley, raising the valley floor 600 feet.
- \_\_\_ As the landslide came into the valley, huge chunks of the mountain, called “hummocks,” stayed intact.
- \_\_\_ Half of the landslide traveled northeast and spilled into Spirit Lake, causing a 260-foot tidal wave across the water, washing up onto the opposite hillside and totally destroying the old growth forest there.
- \_\_\_ The new landslide material also permanently raised the level of the lake more than 2,000 feet above the pre-eruption level.
- \_\_\_ The landslide contained 13 glaciers from the top of the mountain which were buried in the landslide and eventually covered with ash.
- \_\_\_ After this, 1,300 feet of the mountain disappeared in the landslide, a massive steam explosion came, spreading across the landscape to the north.
- \_\_\_ This steam explosion went lateral, uplifting 150 square miles, causing the new growth forest to look like toothpicks laying on top of each other.
- \_\_\_ Usually when a mountain first erupts, the explosion goes straight up, but Mount St. Helens did something similar since the first explosion went straight out to the south.

- \_\_\_ For the next nine hours the mountain released the equivalent of 40 million tons of TNT blast energy. That's equivalent to 33,000 Hiroshima-sized atomic bombs, or one atomic bomb a second.
- \_\_\_ The dirt and magma cloud spread across the eastern part of Washington State. Cities like New York and New Orleans were turned from day to night in a matter of days.
- \_\_\_ As the buried glaciers in the landslide debris heated up, they eventually exploded, causing large pits in the landslide material.
- \_\_\_ All of the melted snow and ice caused a mudflow down the Toutle River.
- \_\_\_ The mudflow carried ash, pumice, and rocks, tens of miles down the valley, all the way to the Mississippi River.
- \_\_\_ Shipping lanes in the region were never shut down because of the debris clogging up the river.
- \_\_\_ Down the Toutle River valley, bridges were totally gone. Logging camps were destroyed. Houses were washed away. The devastation was massive.

### Discussion Questions:

1. Having seen this type of blast for the first time, scientists were now able to find 300 other volcanoes on earth that they were able to explain based on the observations from Mount St. Helens. What other volcanoes are known to have erupted the same way Mount St. Helens did?

2. What descriptions in Psalm 104:23 that are hinting at volcanoes speaks to the power of God?
3. Is Mount St. Helens considered to be a massive volcanic event or merely a small to average? Was the volcanic activity in places like Yellowstone larger or smaller than that of Mount St. Helens? (Hint: One of these eruptions at Yellowstone was estimated at 2,500 times larger in its destructive force.)

### Bonus Activity:

See if you can find news reports about the eruption online and read the way the event is described; here are some details to help you:

- The day after the eruption, there were 57 people dead and the devastation was beyond description.
- In recent memory, no one had ever seen such catastrophic destruction.
- President Jimmy Carter even flew over the area a few days after May 18 and described the blast zone as looking like the surface of the moon.

But in the destruction came a research opportunity for volcanologists and creation scientists. As the eruption began to be studied, it revealed how many geologic features around the world could have happened as a result of major catastrophes, in particular, the global Flood.

# Ape Cave

**Fill in the blanks with words from the following list:**

Ape	hot	Pacific	lava
caves	Kilauea	“Bigfoot”	Oregon
formations	peaks	extinct	south
flow	Mazamma	foresters	

The Cascade Range has a wide range of volcanic \_\_\_\_\_. Some have remained dormant, some have gone \_\_\_\_\_, while others remain active.

Crater Lake in southern Oregon is the remnant of Mt. \_\_\_\_\_, which imploded a few thousand years ago, and its ash can be found all around the \_\_\_\_\_ Northwest.

Another imploded mountain is at Newberry Crater in central \_\_\_\_\_, and like Yellowstone, is considered active because of its \_\_\_\_\_ springs.

On the \_\_\_\_\_ side of Mount St. Helens great ancient lava flows can be seen at the timberline level. Those who explore this area will see some great geologic \_\_\_\_\_.

Most volcanoes have \_\_\_\_\_. At Mount St. Helens, it is \_\_\_\_\_ Cave. It's one of the longest in the world at almost 12,000 feet.

The origination of the name for Ape Cave is somewhat unclear, but some think it goes back to alleged \_\_\_\_\_ sightings in the area back in 1924, where a “big ape” was seen.

Others say it's due to the \_\_\_\_\_ and loggers from many years ago who were referred to as "Brush Apes". Another group says it was named after a Boy Scout troop called, the "apes" back in the 1950s.

This lava cave was formed when the lava \_\_\_\_\_ cooled on the top, but the hot lava still ran underneath. Eventually it got lower and lower and left the cave altogether.

This type of cave formation can be seen at active volcanoes like \_\_\_\_\_ in Hawaii.

**Use the numbers between 1 and 6 to order the events into the sequence that created lava caves:**

- \_\_\_ a cave is left
- \_\_\_ the top hardens and a lava tube forms
- \_\_\_ eventually the lava stops flowing
- \_\_\_ hot lava flows through a trough
- \_\_\_ the top of the trough cools because it's closest to the surface
- \_\_\_ the rest of the lava keeps flowing

### Discussion Questions:

1. The upper Ape cave is about 1.5 miles long and climbs up 400 feet where cavers hike over 27 boulder piles and scale an 8-foot-high lava fall. How old do scientists think the tunnel may be? Has the cave been created by only one lava flow or several over time?
2. Why do researchers think it is unusual for Mount St. Helens to have produced a lava tube like this one?

3. How can the lava tube help us understand how Mount St. Helens formed after the Great Flood? What does all of this say about the power and awesomeness of God?
4. Why does the existence of the lava tube prove a younger age of the earth? What would have happened to it if it had been in existence for millions of years?

It's pretty amazing to think you can hike the same path where molten hot lava flowed down Mount St. Helens. This is a place to truly explore and see God's handiwork!

Science, it's awesome!

## Rapid Strata Formation

The eruption on May 18, 1980, at Mount St. Helens was impressive. When the north side of the mountain slid into the valley below, it created a gold mine of research material for creation scientists like Dr. Steve Austin who studied many of these formations.

**Please note if the following statements are true (T) or false (F).**

- \_\_\_ The valley below was covered with 6,000 feet of landslide deposits.
- \_\_\_ The nine-hour eruption laid huge deposits of ash and pumice on top of the landslide.
- \_\_\_ On June 12, not more than a month later, another major eruption put an additional 25 feet of deposits on earth's newest landscape.

- For almost two years the mountain went quiet. Then in March 2026 there was another major eruption, which melted ice and snow that had collected in the crater.
- Large amounts of ice water mixed with ash and pumice.
- This created a “lahar,” or flash flood, which came down off the mountain and laid another layer on top of the past layers. The strata — layers of deposits — were forming quickly.
- As the mudflow reached the north side of the blast zone, the water came to an obstacle and began to pool.
- The gathering water eventually eroded through the obstruction and carved some amazing canyons on the valley floor.
- As scientists looked at the layers in the canyon walls, they saw what could have been interpreted as individual volcanic events based on the way the layers appeared. Scientists call this “building a sequence.”
- Secular scientists have held that geologic layers take long ages to form because they hold to the idea of *uniformitarianism*, which means lots of change over long periods of time.
- At Mount St. Helens, these layers were formed in a matter of hours and there was direct observation of their formation.
- For example, the 25-foot June 12 layer was formed in just three hours.

- \_\_\_\_ The layer was formed when the mountain erupted and a hot pyroclastic flow rushed down the northern flanks of the volcano at an amazing speed. Because of the erosion, we can see this layering in the canyon walls today.

### Discussion Questions:

1. If one were to explore these canyons formed during the events of Mount St. Helens, would you have any idea how quickly these layers had formed without knowing the date of the eruption?
2. Why is the following conclusion incorrect: A uniformitarian scientist might have guessed there were many eruptions over long ages because that's the main idea which has been taught over the last one hundred years, and the layers look similar to rock layers they assume took long ages to form.
3. What is catastrophism and why has it been ignored or discounted by the secular scientific community despite evidence that supports the concept? (Hints: Noah's Flood and "long" ages)
4. Why can't secular scientists admit the global Flood of Genesis occurred?

### **Fill in the blanks with words from the following list:**

Secular	homogenized	sedimentary	water
pyroclastic	seconds	canyon	elevation
particles	fine	lamina	geology
evidences	receding	landscape	
micro-thin lamination			

Uniformitarianism has dominated the study of \_\_\_\_\_ for the last 150 years as God's Word has been rejected.

As scientists looked closer at the June 12 layer, they discovered fine and coarse materials had been laid down as separate layers called \_\_\_\_\_. What was amazing was that these had been formed in the \_\_\_\_\_ flow in winds moving over 100 mph!

It would be logical to assume that catastrophic processes would just mix up all of the material into one big \_\_\_\_\_ deposit with no distinct layers. But here at Mount St. Helens, just the opposite has been observed.

In these layers, there is a feature called \_\_\_\_\_ where there are coarse and \_\_\_\_\_ layers just millimeters from each other.

This amount of detail is remarkable, because it has been proposed by \_\_\_\_\_ scientists that such features take long ages to form, not minutes or \_\_\_\_\_. Yet this is what has been observed to have happened at Mount St. Helens.

In other \_\_\_\_\_ across the earth, we can observe many similar features, such as in the lower sandstone layers at Grand Canyon.

Secular scientists have proposed that all \_\_\_\_\_ layers in the Grand Canyon were formed by seas coming and going over millions of years. As the seas persisted, sediments from the waters made the layers as \_\_\_\_\_ settled out of the water. Eventually, the seas left and the land was pushed up to its current \_\_\_\_\_.

There are many \_\_\_\_\_ we can look at to show that these layers were not formed by seas over millions of years. Indications are that these layers were formed very quickly by \_\_\_\_\_ during the year of Noah's Flood.

As the Flood waters moved around the earth, large amounts of sediments settled out, forming layers of sediment. When the Flood waters were \_\_\_\_\_, they continued to dump sediments on the \_\_\_\_\_ in very short order.

With the observable evidence left after the eruption of Mount St. Helens, we now realize how quickly fine and coarse layers can form, given the right conditions. It doesn't take millions of years to form these types of layers . . . just the right catastrophic conditions, such as we would expect during the Flood.

Mount St. Helens provides a miniature laboratory for the study of particle stratification and concepts related to the Global Flood.

# Rapid Erosion

As the landslide fell into the Toutle River Valley, over 25 square miles of new landscape developed, up to 600 feet thick in some places. Layers of ash and pumice were also deposited on top of the debris field. The lush valley became a gray wasteland, similar to the moon.

After the major volcanic activity in 1980, the mountain went quiet for a couple of years. During this time ice and snow accumulated in the crater. Then in March of 1982 the mountain became alive again. The sequence of events are as follows:

- Large amounts of snow and ice melted in the crater and broke through fresh landscape, carving two huge canyons, Loowit Canyon and Step Canyon, with depths up to 600 feet.
- Not only did it erode through ash deposits, but also through 100 feet of solid rock from lava flows thought to be about 500 years old.
- The water then came cascading down the flanks of the mountain and into the valley.
- When it reached a large pit left from a glacier steam explosion, the water pooled and was dammed up to a depth of 125 feet across the valley floor.
- The mudflow eventually broke through the dam and kept flowing to the west, down the Toutle River valley, carving canyons as it went.

What the mudflow left behind stunned scientists from around the world. The forces of erosion carved a series of canyons up to 140 feet deep, all in just hours.

One formation has been called “The Little Grand Canyon,” because of its similar features. It is about a 1/40th scale model of the Grand Canyon.

### Discussion Questions:

---

1. Secular scientists point to canyons around the world, like Grand Canyon and Zion Canyon, proposing that the small rivers in the bottom of the canyons carved what we see today over millions of years. What assumptions on the age of the earth are they making to explain this secular theory?
2. A proper understanding of the evidence after actual observations of the rapid canyon formation at Mount St. Helens led many researchers to conclude that to carve canyons of large magnitude you need a lot of water in a short period of time, not the small rivers over millions of years. Why was it so important that scientists be able to see these events actually take place in understanding the evidence left behind at other locations?
3. Contrary to what most scientists might think, it isn't the river that carved the canyon, it was the canyon which formed and provided a passageway for the river to flow through. Explain how this concept undermines the secular model regarding the role of rivers in canyon formation.

**Please note if the following statements are true (T) or false (F).**

- \_\_\_ If one were to walk through this canyon using the uniformitarianism model of long ages, they would imagine it took tens of thousands to millions of years for the north fork of the Toutle River to carve this canyon.
- \_\_\_ Yet we know from eyewitness accounts that it happened very rapidly.
- \_\_\_ While we may not have direct eyewitness accounts of how the major canyons around the world were formed, we do however have the Bible, God's eyewitness testimony that gives us a framework by which we can look at these other canyons and features.
- \_\_\_ The biblical record and subsequent models based on what we have observed from other events we did witness are irrelevant to understanding these other canyons.
- \_\_\_ At Mount St. Helens we were not able to see the landscape before these canyons were formed and we know the events and mechanisms which laid down the strata and carved the canyons through them.
- \_\_\_ Because of the events at Mount St. Helens, even many secular geologists are junking the idea of millions of years for the formation of Grand Canyon and are thinking in terms of catastrophe.

What type of catastrophe would have cut the Grand Canyon and other huge canyons around the world? You

would have needed a lot of water over a short period of time. There's only one event recorded in human history that is the key to accomplish this . . . the Flood of Noah's day as recorded in the Bible.

**Fill in the blanks with words from the following list:**

eroded	Kaibab Plateau	receding	ideas
trapping	creationists	dam	gaps

There are a number of \_\_\_\_\_ of where the water came from to carve the Grand Canyon. Some creationists have developed the idea of two great lakes behind the \_\_\_\_\_.

The \_\_\_\_\_ formed by the plateau was breached and \_\_\_\_\_ the canyon in a matter of days as the lakes drained rapidly.

These lakes would have been left from the \_\_\_\_\_ floodwaters as valleys and plateaus quickly rose at the end of the Flood, \_\_\_\_\_ the water in these huge lakes.

Other \_\_\_\_\_ have suggested that the Grand Canyon and many other canyons around the world were formed when the floodwaters were receding across the land, cutting huge \_\_\_\_\_ in the landscape.

Using Mount St. Helens as a laboratory for studying catastrophic processes helps us to realize the incredible impact the worldwide Flood had on forming the earth's features we see today!

# Lava Cast Forests

Just to the south of Mount St. Helens is a fascinating feature called the Trail of Two Forests. Here is your opportunity to learn a little of the history of this feature!

## *Bonus activities:*

---

Research the Trail of Two Forests online and see if you can find images of it. Create a poster with some of the images you find and the following information points:

- About 2,000 years ago, when the lava flow came through here, there was a tree standing in this exact place.
- As the lava flowed around it, it hardened enough against the cool wood to make a form right there.
- And then the wood vaporized through the heat.
- Whatever was left just rotted away, leaving a hole.
- When the lava came through, not all the trees were upright. Some of them fell down and created lateral tunnels all across the area.

Since that time, a new forest has grown on top of the lava flow, hence, the trail of two forests. An easy-to-use walkway has been built for us to see this great volcanic feature.

# Log and Log Deposits

**Please note if the following statements are true (T) or false (F).**

- \_\_\_ When Mount St. Helens erupted on May 18, 1980, the largest landslide in recorded history slid down into the valley below.
- \_\_\_ Three-fourths of the landslide barreled into Spirit Lake, causing an 860-foot wave across the lake.
- \_\_\_ That huge wave washed up on to the surrounding hills and into the old growth forests.
- \_\_\_ When the water came washing up from the lake, it pulled down about one billion trees with it.
- \_\_\_ The landslide also displaced the lake so that the present level is 2,000 feet above the level it was before the eruption.
- \_\_\_ Mountain cabins and lakeside camps were buried in a matter of weeks.
- \_\_\_ As the eruption stopped and scientists were able to get into the blast zone, an amazing site began to be revealed. Some first thought Spirit Lake was gone because they couldn't see it, but it was covered with logs.
- \_\_\_ As the lake emerged, secular scientists were excited to know this would be their first chance to study how logs would behave after this catastrophe.

- \_\_\_ What they found would reinforce the way they had always thought about the development of petrified forests.
- \_\_\_ Since 1980, the number of logs on top of the lake has steadily increased dramatically.

## Where Did the Logs Go?

**Fill in the blanks with words from the following list:**

root balls	living	resin	sink
waterlogged	mapped	mystery	soaked
absorption	bark	upright	sonar
interpret	species	Spirit Lake	

After the eruption, scientists studied how the logs became\_\_\_\_\_.

Because the \_\_\_\_\_ at the bottom of the logs were denser, they began to sink first, forcing the log to stand \_\_\_\_\_, halfway in the water.

As the logs \_\_\_\_\_ up more and more water, they began to \_\_\_\_\_ to the bottom of the lake.

What also became evident was certain \_\_\_\_\_ remained floating, while others disappeared beneath the waters.

After careful study, it was discovered that some tree species, such as Noble and Silver Fir contained less\_\_\_\_\_.

Resin slows the \_\_\_\_\_ of water, so those logs with more resin would stay afloat longer.

The other curious thing about the logs still floating is that their \_\_\_\_\_ had been stripped off. Where did it go? The only logical explanation is that it went to the bottom of the lake.

These processes were new to scientists, so they began to study in this \_\_\_\_\_ laboratory.

What excited them the most was how what they found could help them \_\_\_\_\_ other geologic sites around the world.

With many of the logs and all the bark gone from the top of the lake, they felt the real \_\_\_\_\_ lay below the water.

After getting the right permits, they first took a small boat to \_\_\_\_\_ with a sonar tow fish. They went back and forth among the giant logs and \_\_\_\_\_ the bottom of the lake.

What they found was amazing. The \_\_\_\_\_ map showed as many as 10,000 small and large logs standing straight up on the bottom at various levels in the sediments.

Then Dr. Austin did what any good scientists would do . . . further investigation.

## **Within the Lake**

Dr. Austin and his team put on SCUBA gear and dove down about a hundred feet. As the sonar map had showed, they found logs standing upright at different levels.

Some were planted firmly, others they could move back and forth. They also had root masses at the bottom, but broken off, as if they were pulled out the ground in a catastrophe.

Given the right conditions, such as another large eruption from Mount St. Helens, these logs could end up completely buried under ash and sediments. If the area was eroded away, it would give the appearance that multiple forests had grown there, one on top of the other over many years.

Dr. Austin began to look at other geologic features to see if they could be explained using Spirit Lake as a model. He turned his attention to Yellowstone's Petrified Forest at Specimen Ridge.

### Discussion Questions:

1. Secular scientists developed the idea that this particular petrified forest was at least 27 different forests, which had grown there over millions of years. A forest would grow, and then be destroyed by eruptions. Another forest would then grow. Depending on what trees are in the forest — hardwood or softwood — it could take shorter or longer periods for the forest to grow. If you incorrectly assumed each of 27 forests took at least 100 years to grow before being destroyed every 10,000 years, how old would the earth have to be in order for that calculation to work? (Hint: # of forests multiplied by 10,000 years + how it look it took the 27 forests to grow at 100 years each)
2. The time frame to develop all of these forests would have been much greater than the biblical time scale

of 4,350 years since the Flood, so Dr. Austin chose to look at it from a catastrophic model and keeping the global Flood in mind — something a secular scientist would never consider. Do you think it is important for scientists to keep an open mind when studying things that occurred before recorded or observable history? How does this help or hurt the study?

Dr. Austin and his team hypothesized that if the Petrified Forest at Specimen Ridge forest was developed with the same processes as those at Spirit Lake, there should be very little evidence for multiple forests over long ages.

## Solving the Mystery

Dr. Austin's team got permission to dig up some of the root balls of the trees at Specimen Ridge. As they suspected, the trees didn't have spreading roots because they didn't grow there. Just like at Spirit Lake, these logs were ripped out in a catastrophe and deposited there. Dr. Austin and other researchers found several other key factors which determined the trees didn't grow there.

**Fill in the blanks with words from the following list:**

park sign	subterranean	ash	chemical
long ages	Yellowstone	petrify	log mats
pressure	fissures	burrowing	rings
great deep	uniformitarian		

The tree \_\_\_\_\_ all matched in size, there was no evidence of \_\_\_\_\_ animals, and the ash in the soil mostly came from the same eruptions.

The petrified forests at \_\_\_\_\_ were formed by catastrophe in very short order. The \_\_\_\_\_,

which told of multiple forests over millions of years, was taken down.

The \_\_\_\_\_ explanation of the evidence just didn't hold up.

At the beginning of the global Flood, as described in the Bible, the rains came down and the fountains of the \_\_\_\_\_ were opened.

It is believed these fountains were \_\_\_\_\_ water and volcanic \_\_\_\_\_. During the Flood, water pushed across the land, ripping up forests across the landscape.

Some of these logs were buried instantly, but many floated to the top of the water, creating giant floating \_\_\_\_\_, like those seen at Spirit Lake.

In various places around the world, these logs would have begun to sink to the bottom of the waters and buried quickly in sediments and \_\_\_\_\_.

With the immense \_\_\_\_\_ from above, the heat from below, and the right \_\_\_\_\_ mixture in the ash, the logs would have petrified quickly.

Some secular scientists have told us that it takes \_\_\_\_\_ to petrify wood, but actually it really doesn't take that long. Experiments have been performed in the lab which found that logs can \_\_\_\_\_ in less than a year.

There's a whole industry which petrifies wood quickly and sells it as flooring in homes. Given the right conditions during the Flood, producing a massive petrified forest would have been easy.

## Bonus Activity:

---

- Look up tree rings. What kinds of information can scientists learn from tree rings? Do these rings give clues to climate, disease, or disasters that may have happened during the life of the tree?
- Want even more ways to learn about the event? *The Case of the Missing Mountain* by Kim Jones is a fun and activity-based learning tool for children studying Mount St. Helens. With clues to decode, mysteries to solve, and special project activities, it is a great way to extend your study of this incredible event!

## What It Means:

The events at Spirit Lake have given us a miniature laboratory of scientific study for the way logs get buried in a catastrophe and give us a model for how things could have happened on a much larger scale during the Flood.

Real science is what we can study and repeat, then we can use those results to interpret other features around the world, such as at Yellowstone. Real science is a good confirmation that the Bible can be trusted as earth's true history book!

# Peat and Coal Formation

The catastrophic events at Mount St. Helens have not only helped explain petrified forests, but also the formation of our large coal beds.

**Please note if the following statements are true (T) or false (F).**

- \_\_\_ The coal deposits around the world can be hundreds of feet thick and provide fuel for heating and electricity generation.
- \_\_\_ The coal deposit layers are usually very glassy and rough.
- \_\_\_ Secular scientists have developed the idea that these massive coal deposits were formed slowly over billions of years in fresh water oceans.
- \_\_\_ In the secular model of how coal forms, the logs fell from the forest over long periods of time, and were buried in the antiseptic waters of the swamp.
- \_\_\_ Over millions of years, a thick spongy layer of broken plant material developed, called “peat.”
- \_\_\_ This peat layer never was buried by other sediments such as clay, mud, and sand. It eventually turned into coal.

The hypothesis of coal forming from peat in ancient swamps sounds like a good story, but there are some significant challenges with this secular idea. This is

especially true when you study the quality of swamp peat and peat beds.

## **A Different View**

Beds of peat can be found around the world. In Nova Scotia, there is a big layer of peat near the coastline which was developed over a few hundred years. Recently the layer was exposed through erosion; this and layers of other modern swamp deposits show something very interesting.

These peats are usually full of roots and the layers are not very smooth. If the present is the key to the past, as secular scientists believe, then there is a major problem.

When we go to the great coal beds of the world they are very smooth and glassy, and absent of roots. Such evidence simply remains without a good explanation in the secular view, but in a biblical view this is no problem.

These layers were made mainly from tree bark in a catastrophe, not swamp materials. Because of the size of the beds and the materials they were made from, it would have required massive amounts of organic life to create, and must have been deposited and buried quickly.

The events at Mount St. Helens and the record of the biblical flood could give us an answer to how these coal beds actually formed.

1. When the trees were uprooted during the eruption at Mount St. Helens, they deposited as logs in Spirit Lake.
2. It didn't take long for those logs to rub together and scratch most of the bark from the trees. When Dr. Austin and his team dove into the lake, they found

about three feet of bark peat on the bottom of the lake from the logs above.

If there were ongoing eruptions at Mount St. Helens, the peat would be catastrophically buried by ash and other sediments. That would make this layer of peat a candidate to be converted to coal. If the logs at Spirit Lake only produced three feet of peat, with the immense amount of coal we find today, there would have been a lot more vegetation floating on the water, which is what we would expect during the Flood. See the connection?

**Using numbers between 1 and 5, see if you can put together this important sequence of events of how the giant coal beds we find today were formed in the Great Flood:**

- \_\_\_ Because of wave action and winds, this vegetation is thought to have clumped together on the surface, creating giant floating log mats.
- \_\_\_ The sediments applied pressure to the peat to make coal in very short order.
- \_\_\_ After much of the peat was deposited, the subsequent flood waters would have laid sediments on top of the peat.
- \_\_\_ As described earlier, the Flood would have ripped up much of the vegetation as the waters prevailed on the land.
- \_\_\_ Just like at Spirit Lake, the logs would have rubbed together, and the bark would have fallen off and sunk to the bottom of the sea to form a layer of peat.

## Discussion Question:

---

The type of coal we find in the giant coal beds is very smooth and glassy, and by natural means, can really only be formed by rapidly laying down tree bark under water. How does this show that it was a catastrophic event rather than swamp action over millions of years that formed it? (Hint: be sure to get to the “root” of the matter!)

Does coal take long ages to form? No, it doesn't. Labs today are making coal in just a few weeks, so it does not take long ages like secular scientists would propose. All you need are the right catastrophic conditions.

Using Mount St. Helens as our miniature laboratory, the Bible as our history book and ultimate authority, and the Flood as the catastrophic process, the giant coal beds can easily be explained using this floating log mat model. And God's Word is the key to unlocking the mystery.

# BIOLOGICAL RECOVERY

After the May 18, 1980, eruption at Mount St. Helens, the blast zone north of the mountain was a wasteland. In one minute, the virgin forests and pristine lakes were transformed into a grey, desolate landscape.

The landslide deposit covered the valley floor up to 600 feet, then it was covered by thick layers of ash, pumice, and mud flows. It was a new landscape, and scientists were very interested to see how long it would take for life to return.

In the surrounding mountains, trees were knocked down and all small vegetation was obliterated. Any wildlife in the area was vaporized in the steam explosion. It was estimated that 1,500 elk were killed, 11 million fish, 1 million birds, 5,000 deer, and 200 black bear.

**Fill in the blanks with words from the following list:**

nitrogen	spring	sections	hundreds
<i>Legionella</i>	side	bacteria	alders
scat	biological recovery		pocket
blast zone	Lupine	toxic	plankton
nutrients	design	oxygen	organic
hibernation	reintroducing	algae	

Much of Spirit Lake was considered a \_\_\_\_\_ brew of volcanic gasses seeping up from the lakebed.

Because of all the \_\_\_\_\_ material now in the lake, it became a hydrogen bubble, stinking of methane. Almost all of the \_\_\_\_\_ in the water was depleted.

The temperature of the water had risen 20 degrees C. \_\_\_\_\_, which causes Legionnaires' disease, was also found in the lake.

Very little could live there except for \_\_\_\_\_ and a little bit of \_\_\_\_\_. It was quite a mess.

At first glance, every living thing had been destroyed. Many scientists thought it would take \_\_\_\_\_ of years for any life to return. But because of God's amazing \_\_\_\_\_ in nature, life returned much sooner than expected.

The lumber companies decided to replant their \_\_\_\_\_ of land with new trees, but the Forest Service decided to let their land grow back on its own. It became a living laboratory on \_\_\_\_\_ after a natural disaster.

Because it was \_\_\_\_\_ when the mountain erupted, there was still snow on the ground. Many animals were still in \_\_\_\_\_. Baby trees were also under the snow.

As spring turned into summer, the \_\_\_\_\_ gophers came to life, breaking up the soil and spreading the seeds into the blast zone.

Elk would eat plants outside the \_\_\_\_\_, come in and leave their scat on the ground.

The seeds in the \_\_\_\_\_ would start growing as plants. In the same way, birds also carried seeds in.

But much of the soil was heavy in \_\_\_\_\_ because of the ash. Most plants don't grow well in soils filled with this chemical element, but some plants do.

\_\_\_\_\_ began growing like crazy across the landscape. It is able to eat up the nitrogen and develop the soil into a friendlier place for larger plants.

Eventually \_\_\_\_\_ and conifers began to grow. Since 1980, a young forest has grown up in the blast zone.

In Spirit Lake the bacteria went to work by eating up the toxic chemicals. The \_\_\_\_\_ put oxygen back in. And within five years the water was back to its original quality.

Fish were found in the lake again. Some could have stayed in \_\_\_\_\_ streams, but a majority of the comeback was due to fisherman \_\_\_\_\_ trout into the lake.

Within a few years, it was known that some fish were reaching lengths of 25 inches, much due to the good \_\_\_\_\_ provided by the ash and sediments from the eruption.

This was just part of the biological recovery at Mount St. Helens. The wildlife has returned, too. There are now between 2,000 and 3,000 elk living in the blast zone, almost double what was there before. Birds and small animals have also come back in great numbers.

The spider population has also flourished. With a large open area, they have been able to float in on air currents unhindered. It's estimated that two million spiders land on one square mile of land in the blast zone every day.

## Discussion Questions:

---

1. Why is the fast recovery after the eruption so important to those of us who believe in the Bible as God's history book? As you consider the question, keep these two important points in mind:
  - God is good and a good designer of our planet. Remember, God has designed our earth to recover from catastrophe much quicker than secular scientists used to think possible.
  - He may use his finger and make the mountains smoke, but He also desires that there be a quick restoration of what was destroyed — we see the goodness of God even in this sin-cursed and broken world.
2. How does the recovery at Mount St. Helens also give us a glimpse into the quick recovery of our planet after the global Flood?
3. Compare and contrast the eruption with the global Flood. Think about each catastrophic event in terms of scale (how much area was affected), length of time during the event itself, why the events occurred, and clues to biological recovery occurring afterward.
4. Create a time-line of the events of the Great Flood from information we are given in the Bible.  
(Hint: Just over a year after boarding the ark, Noah and the animals walked on to dry land.)

As you record events during the Great Flood, remember it was important that there be enough vegetation and food for the animals sheltered on Noah's ark to survive on the

earth's new surface. What was the first clue Noah received that proved vegetation was already recovering on the planet?

## Why It Matters

We can see at Mount St. Helens a miniature laboratory for quick recovery from a catastrophe, and we can apply what we've learned here to see how a quick recovery of the earth after the Flood was possible.

The recovery of an ecosystem is very complicated. At Mount St. Helens we see God's design in how he created soils, plants, and animals to reclaim the landscape quickly. Without God's design in nature the recovery would have been impossible if the processes were left simply to chance.

There was definite order to this biological recovery at Mount St. Helens and it should encourage us to praise God for His incredible design.

## Bonus Activity:

Earlier we learned about lupine and how it actually helped other plant to recover by what it did to the soil. See what you can find out about lupine — a picture, and even how it works to remove nitrogen from the soil. Then see if you can find other amazing plants like this that can make a difference in the environment allowing other plants or animals to flourish!

# MOUNT ST. HELENS: CONCLUSION

Mount St. Helens teaches us many things about catastrophic processes, recovery, and even a bit about God's character. We know that 57 people died in the eruption, yet every one of them had received warnings about the coming danger.

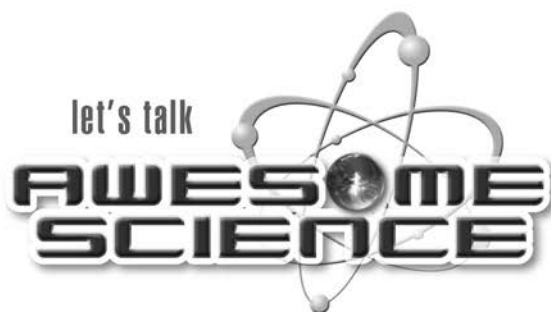
In the same way, the Word of God says there is another coming worldwide destruction, this time by fire. All of us have been warned to get out of harm's way by repenting of our sins and coming into salvation through faith in God's son, Jesus Christ.

We've also learned that geological processes thought by secular scientists to take millions of years can happen much quicker given the right conditions. It doesn't take millions of years to form canyons, stratified layers, and petrified forests. That can happen in only days, weeks, and months.

The global Flood as recorded in the Bible provides many of the right conditions for geologic processes around the world to produce these features in very short periods of time.

Secular scientists have their own ideas about how the earth was formed over billions of years, but they leave out God's supernatural touch and judgment. Yet many of the "evidences" they use to support evolutionary ideas are better interpreted when looking at them through the truth of Scripture.

Mount St. Helens showed us on a small scale the catastrophic processes that were at work during and after the Flood 4,300 years ago. Science — it's really awesome!



*Join me and other students at*  
**CreationConversations.com**  
*(if your parents are awesome, they are invited too)*



A **DVD series** exploring  
cool sites around the globe  
and discovering evidence  
the Bible is 100% true!

EXPLORE



# Mount St. Helens

with  
Noah Justice

Designed to make science fun, the *Awesome Science Series* is an educational and entertaining opportunity for everyone.

Designed to make science fun, the *Awesome Science Series* is an educational and entertaining opportunity for everyone. This study guide was designed for use with *Episode 5: Explore Mount St. Helens* to display the knowledge the student has obtained by watching Noah talk about the formation of this area through cataclysmic events. Many similar geologic features worldwide are explained by the activity of the Flood using Mount St. Helens as a scale model.

**MB**  
Master  
Books®

A Division of New Leaf Publishing Group  
[www.masterbooks.net](http://www.masterbooks.net)

RELIGION/Christian Education/General  
RELIGION/Religion & Science  
\$3.99 U.S.

ISBN-13: 978-0-89051-679-9



9 780890 516799

EAN