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EXPLORE

**Yosemite** and

**Zion National Parks**

with  
Noah Justice

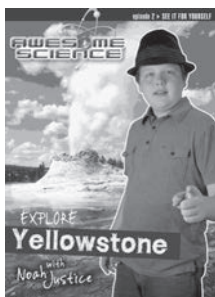


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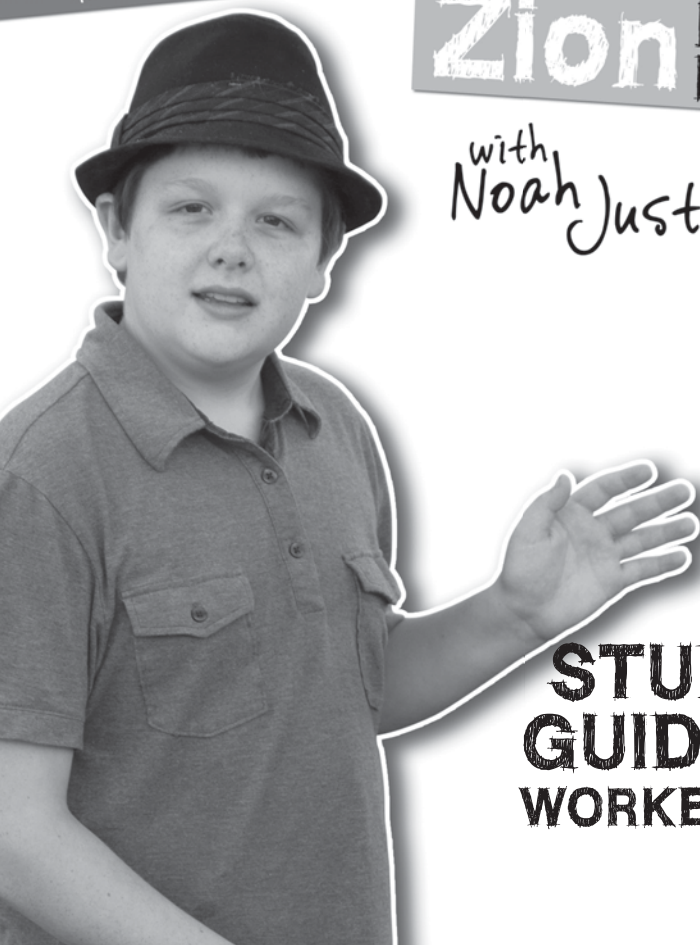


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**Zion National  
Parks**

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**STUDY  
GUIDE &  
WORKBOOK**

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# Introduction

Because of its amazing beauty and size, Yosemite National Park was one of the first pieces of land set aside for the enjoyment of the public in the United States.

The amazing granite cliffs are a part of the Sierra Nevadas, a huge rock batholith thought to have been formed over millions of years. But new evidence helps researchers understand how the formation of these mountains took just weeks or months.

In addition, Yosemite Valley is thought to have been cut by the Merced River and multiple ice ages over long ages, yet this huge valley is actually evidence of erosion due to a catastrophe during and right after the Global Flood.

Secular scientists have over 60 different explanations for how the many ice ages may have formed, but astute researchers recognize that the conditions right after the global Flood are the best model to explain the one, major Ice Age.

Another amazing geologic feature appears just a few hundred miles from Yosemite — it's the great Zion Canyon in Utah.

Secular scientists have some major challenges explaining how the cliffs were formed and the canyon was cut. Huge sandstone layers, steep canyon walls, amazing arches, and large hanging valleys . . . are all good evidence of a worldwide catastrophe.

All this and more from the Awesome Science DVD Series!

## Bonus Activity:

See if you can figure out using a map or atlas, how close Yosemite National Park and Zion National Park are to each other. Based on what your map shows, which covers more area?

## Complete Word List

accelerated	erosional	polonium
accumulation	evidences	potholes
alpine	friction	precipitation
ancient	geology	preconceived
assumption	glaciation	radioactive
atmosphere	glacier	radiohalos
atoms	gorge	radioisotope
basins	granite	radium
batholith	gravity	receding
canyon	habitation	research
cataclysmic	hanging valleys	sandstone
chain	igneous	seafloors
channel	indicators	sedimentary
cliffs	inland	temperature
continent	landscape	theory
crisscrossing	meadows	timescale
crossbeds	microseconds	trustworthy
crystals	mountain	unbiased
cubic	Navajo	uniformitarian
dams	observable	Uranium 238
deluge	obstruction	valleys
deposits	particles	vertical
ecology	patriarchs	waterway
elements	pluton	worldview

## Key Concepts

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biblical	erratics	radiometric dating
biological	evaporation	scientific
catastrophic	genealogies	sheet erosion
contamination	humanist	
channel formation	hypothesis	

# About Yosemite National Park

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

million	deep valley	alpine	nature
El Capitan	glory	order	California
glaciers	inspiration	Rhode Island	granite
formation	Biblical	Yosemite Valley	

Yosemite is breathtaking from the minute you enter her cathedral \_\_\_\_\_ peaks rising several thousand feet above the valley floor.

It's no wonder author and champion for national parks John Muir said, "No temple made with human hands can compare with Yosemite, where God's attributes and \_\_\_\_\_ is revealed." (Romans 1:20)

Muir believed that the best place to discover the true attributes of God was in \_\_\_\_\_ and that God is always active in the creation of life, and thereby has continued to keep the natural \_\_\_\_\_ of the world. (Colossians 1:16-17)



About the size of \_\_\_\_\_, Yosemite National Park covers 1,190 square miles and is full of valleys, giant cliffs, waterfalls, \_\_\_\_\_ lakes, and even active glaciers, with its highest point being over 13,000 feet.

Yosemite was first set aside by Abraham Lincoln on June 30, 1864, and given to the State of \_\_\_\_\_ to oversee. It was the \_\_\_\_\_ for the first national park, Yellowstone. When the National Parks Service was organized in 1916, Yosemite was adopted in as a national park.

It is visited by over 3.7 million people, mostly in the seven square mile area of \_\_\_\_\_. From the valley floor, giant granite cliffs go straight up and have names such as Half-Dome, \_\_\_\_\_, and Sentinel Dome.

As one looks around, questions come to mind about the formation of this amazing granite rock and how it was cut in such a \_\_\_\_\_.

The granite is thought by secular scientists to have begun forming over 210 \_\_\_\_\_ years ago.

After the \_\_\_\_\_ of the Sierras, the valley was mostly cut by the Merced River and finished off by large \_\_\_\_\_.

Obviously, these time scales don't match with the \_\_\_\_\_ time scale of just a few thousand years.

Evidence has come to light to help explain the quick formation of the granites during the Flood of Genesis, as well as a model for the rapid formation of the massive glaciers and ice sheets of the Ice Age not long after the Flood.

What evidence? Let's take a closer look!

### Discussion Questions:

1. What process do secular scientists think occurred to make the deep valleys?
2. How does the biblical story of Noah and the Great Flood offer a better explanation for these geologic features? You will be learning even more about the evidence in this study guide!

### Bonus Activity:

Find Yosemite National Park on a map; see what photos you can find or a map of the park itself so you can find different geologic and natural features — rivers, mountains, valleys, etc. The National Park Service has websites for each of the national parks, but note, they often promote a non-biblical worldview for the age of the earth. With that caution in mind, they can be a great source to know more about the ecology and animals that make the park their home.

# Evidence for Quick Formation of Granite

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

- \_\_\_ The Sierra Nevada mountain chain stretches across the lower southern United States. Its beautiful granite rocks and volcanic peaks make it an amazing place to visit.
- \_\_\_ Granite rocks make up a major portion of the continental crust. They are observed in many places on the globe.
- \_\_\_ These large areas of granite are called “Batholiths,” which can range in size from just a few hundred feet, to thousands of miles.
- \_\_\_ Secular scientists have developed the idea that this large mass of intrusive igneous rocks formed far below the earth’s surface in hot magma pools, then they cooled, rose up, and tilted over many millions of years.
- \_\_\_ Because the story of evolution is so widely disbelieved, it seems like there is a lot of authority in what secular scientists say.
- \_\_\_ You are probably familiar with the idea of biological evolution — how fish supposedly changed into frogs and then into me and you.
- \_\_\_ Well, secular scientists also talk about geological evolution — how the earth has changed over the

supposed billions of years. They use the idea of uniformitarianism to explain this.

## **What This Means**

For these scientists who refuse to use the Bible to help them understand geology, the same slow and gradual processes that are happening today have been happening for billions of years in the past.

They look at the rock layers and say that they were deposited slowly and then eroded very slowly. That's why it is called "uniform"itarianism, since everything happens in a uniform way. That's one way to interpret the evidence.

When a biblical geologist looks at the rock layers, he knows that there was a global Flood about 3,400 years ago, so the rock layers couldn't have formed slowly over millions of years. The massive rock layers were laid down very quickly during the Flood.

Starting with the Bible — the source of truth from God — we can understand and explain the evidence better than if we ignore the truth of the Bible. That is the other way to interpret the evidence. The more that we observe and understand scientific aspects of creation, the more that we realize that the Bible is a trustworthy source of scientific truth.

## Discussion Questions:

1. How do the biblical genealogies in Genesis help us calculate the age of the earth?
2. There are some within the Church who try to mix long ages, millions and billions of years, with the Bible. The Bible is pretty clear on the age of the

creation and the Flood . . . only about 6,000 years based on the days of creation and the genealogies found in Genesis. Secular scientists reject this age because they dismiss the Bible out of hand, but why do you think some Christians follow secular dating of the earth instead of a biblical one? (Hint: Science is built on theories and hypothesis; what if you assume they are right because science says so, versus it being observable or proven through the evidence available for testing today?)

### Bonus Activity:

- See how many verses you can list in the Bible that speak of God's creation of the world, animals, and people. (Hint — not all of them are in Genesis!)

### **How old is the rock?**

A group of scientists called “The Rate Group,” who believe in the biblical account of creation, a young earth, and a global Flood, challenged this secular idea of long ages by looking deeper into the rocks to develop a different and better model . . . and what they found was stunning.

To date volcanic rocks when they cool, a method called “Radioisotope Dating” is used. This type of dating analyzes the radioactive elements in the rocks. Each radioactive material called “parent” elements decays into other elements called “daughter elements.”

For example, Uranium238, the radioactive parent element, eventually decays into the stable daughter element of lead.

Over 4.468 billion years, half of the uranium atoms in a rock would turn to lead, so it is called the half-life.

It has been demonstrated by observation that different radioactive elements decay at different rates. Some have half-lives of seconds, others decay much more slowly. But of course, no one has watched Uranium 238 for 4 billion years — that would be a boring job — so the rate is calculated from a small sample of time.

There are three basic assumptions used when calculating a radiometric date.

You can't measure a radiometric date like you measure the mass of the rock — you have to calculate it! And that calculation only gives the right date if these assumptions are true.

- The first assumption is that there was none of the daughter element in the rock to begin with.

For example, you would have to assume that there was no lead when the rock was formed to use the uranium-lead dating method. But how would a scientist know this? They can't! That's why it's a faulty assumption.

- The second assumption is that the radioactive element decays at a constant rate. The rate was not faster or slower in the past.

That is the “uniformitarianism” concept again. It basically means that rates don't change as we look into the past — whether radiometric decay or in sedimentary rock layers forming.

Yet the Bible teaches something much different. The earth has gone through a huge catastrophe — global Flood!

In addition, this second assumption does not take into account heat or pressure, or other forces that might have had an influence on the decay rate of an element. In some instances, we can observe radioactive decay rates changing drastically!

- The third assumption is that the elements in a rock operated in a closed system.

In other words, there were no outside influences on the parent or daughter elements (no addition or removal of uranium or no addition or removal of lead), which is a BIG assumption, considering the rock is supposed to have been around for millions of years!

If there was any contamination, then all bets are off on having a good sample to calculate the age of the rock.

For those who believe in long ages, these assumptions are critical to their belief. While there are methods to get around some of these assumptions in some cases, any breakdown in these assumptions would lead to a total meltdown of the arguments for long ages based on radiometric dating.

### Discussion Questions:

1. What are the three assumptions about radiometric dating?
2. What does it mean to make an assumption? Can assumptions be wrong?
3. What is contamination? How could contamination alter a radiometric date calculation?

## Researching the Rocks

The Rate Group decided to take a fresh look at this subject and see what they could learn without being forced to stick to the uniformitarian assumptions.

- They wanted to know if the rate of decay had been different in the past due to catastrophic geologic processes during the global Flood.
- They also looked at the issue of daughter elements to see if they were in the rocks from the beginning, which would throw a monkey wrench in the calculation of the age of the rocks.
- Third, they intentionally looked for evidence that radioactive processes had produced accelerated decay. They began their research by collecting over 1,000 rock samples from all over the world, including Yosemite Valley.

When some radioactive elements decay, in addition to producing the daughter element, alpha particles are thrown off from the parent as it changes into new elements.

Because Uranium 238 is radioactive, some of the intermediate elements are also radioactive, such as Polonium 210, also known as Radium F. We can see this decay in what are called “radiohalos.”

Radiohalos are the damage left by emission of some alpha particles captured in the surrounding rock during the decay series of Uranium 238.

As noted earlier, the half-life of Uranium 238 is supposed to be 4.468 billion years to arrive at lead. But the different types of polonium only have half-lives of 164 microseconds, 3.1 minutes, or 138 days.



If the crystals in the granite rocks cooled slowly over millions of years, or even one year, the radiohalos from polonium would have reached the end of their life and disappeared.

When the rocks from Yosemite were studied, the most bizarre thing was discovered. Polonium halos were found frozen in the rocks.

- The fact that we see any radiohalos from polonium frozen in the rock is good evidence that the rock cooled very fast — fast enough to capture the damage done to the crystals before all of the polonium had turned into lead.
- It is believed by secular scientists that the granite in the Sierra Nevadas was formed slowly over millions of years. But the fact that the polonium radiohalos are found, especially in abundance, in all the granitic rock layers means something much different than slow gradual processes.
- With the right conditions during the Flood, the entire pluton, or mass of igneous rock, would have formed quickly, perhaps within only a couple of weeks. This massive catastrophic process would have contributed to the greatly accelerated decay rate.

As the floodwaters receded due to the continents rising and the seafloors sinking, the Sierras were uplifted to their current position likely in a matter of months.

The Flood was quick and catastrophic, just like the Bible says it was. It didn't take millions or billions of years to form the features we see today.

Science, it's awesome!

## Bonus Activities:

Read your Bible and see how these verses fit in with what you are learning about the earth's history and geology: Psalm 104:8–9, Genesis 8:4, and Genesis 7:17–20.

Can you tell what happened by day 150 of the great Flood? (Hint: They can form in chains and the tallest one in the world is part of the Himalayas in Tibet.)

Look online for images of radiohalos — why are these so important to understanding how quickly Yosemite's landscape was formed? (Hint — that they can be seen is important; why?)

# The Receding Floodwaters: Cutting of Yosemite

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

Cliffs	Muir	mountains	erosion
hypothesize	worldwide	chains	Merced
continents	catastrophe	Glacier Point	water

As you enter through Yosemite Valley, the granite \_\_\_\_\_ rising above 3,000 feet impress the viewer with the grandeur of God.

From \_\_\_\_\_, a visitor can view Yosemite Valley below. Without question, something big cut this valley.

Secular scientists claim that as the \_\_\_\_\_ were pushed up over millions of years, the \_\_\_\_\_ River flowed a little bit faster and cut the valley.

It's hard to imagine this little river cutting this huge valley. It just doesn't make sense based on what we know about the principals of \_\_\_\_\_. There's just not enough \_\_\_\_\_ flow.

In addition, what was the source behind the Merced River to allow it to erode this much land? It just doesn't exist, except in the case of a massive \_\_\_\_\_, like the global Flood.

In the 1800s, John \_\_\_\_\_ explored the park and was the first to \_\_\_\_\_ glaciers were involved in eroding Yosemite.

It's true that glaciers cut and smoothed a valley that already exists, but a valley as big as Yosemite requires something much larger . . . like a \_\_\_\_\_ flood.

Near the end of the Flood, the \_\_\_\_\_ were beginning to rise. Mountain \_\_\_\_\_ were being pushed up and valleys were being formed.

This catastrophic activity that was moving continents subsequently caused the waters to accumulate in the ocean basins and huge sheet erosion planed off new top layers of the earth. (Genesis 8:3–5)

As there was less water flowing toward the ocean, the erosion continued as the water flowed in channels, cutting giant canyons, water gaps, and valleys.

Evidence for this massive water erosion is everywhere across the earth, including Yosemite Valley. But the erosion of this famous valley wasn't over yet. The Great Ice Age was to come next and it also left its marks.

# Evidence for Quick Formation of One Ice Age

Researchers point out indicators in Yosemite where glaciers once filled this area almost up to the top of Half Dome. The large fields of ice flowed slowly downhill on top of the granite, leaving behind evidence of their movement by marks showing their direction of travel. This is reminiscent of other areas also carved out by glaciers like the granites of Sweden.

From our past study, we learned the granites were formed during the time of the Flood, so the ice came after, within the last 4,350 years.

Secular models say the last ice age peak ended 18,000 years ago, but that doesn't match the biblical time scale.

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

- \_\_\_ Secular scientists have over 60 ideas on how the Ice Age formed, but each idea is riddled with problems because they don't allow for a catastrophic event like the Flood.
- \_\_\_ Most simply appeal to a cold globe, but that doesn't make an ice age, just a cold earth. To get an ice age, you need two ingredients: hot oceans and cold continents.

- \_\_\_ Yet, the Flood provides a good model for quick formation of the Ice Age, and the even quicker melting of those same ice sheets.
- \_\_\_ The biblical Flood was not worldwide.
- \_\_\_ Under the waters, the surface of the earth remained completely unchanged by cataclysmic event. (Genesis 7:21-22)
- \_\_\_ The Bible tells us that the Flood started with the fountains of the great deep bursting forth and massive amounts of rain fell for 40 days and nights and the flooding continued until the 150th day. (Genesis 7:11-12, 7:24)
- \_\_\_ After day 150, the water began flowing into the sinking ocean basins as mountains rose higher. Most of the water used in the deluge continually ran off the continents and into the ocean basins. (Genesis 8:3; Psalm 104:7-8)
- \_\_\_ Because of the massive friction due to continental movement, volcanic activity, and other factors, the waters at the end of the Flood were very cold. And this is one of the keys to an ice age: warm oceans to cause lots of moisture to evaporate into the air.
- \_\_\_ This wet air is then carried over the continents by storms.
- \_\_\_ The clouds and the ash in the air cool the climate and don't allow the snow to melt, even in the summer. Over many years, the ice builds into massive sheets and then you have . . . an Ice Age.

Through ocean core samples, researchers suggest that the oceans right after the Flood warmed to an average of 90 degrees, with some places near 120 degrees.

The average today is about 62 degrees, so that is a dramatic difference! We know that warm water — really warm water — is a hotbed to build large hurricanes and storms.

In some computer models, these storms could drop up to 30” of rain an hour. If correct, as they moved inland and up across the mountains, this could also contribute to some of the massive amounts of snow.

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

snowfall	Flood	equalize	systems
summers	ice	model	oceans
meadows	Ice Age	precipitation	winter
large-scale	accumulation	Silver Lake	sunlight

The world record for snowfall in recent history is held by \_\_\_\_\_, Colorado, where 76 inches fell over 24 hours back in 1921.

The conditions right after the Flood would have dropped a lot more snow than this with few breaks between \_\_\_\_\_.

But \_\_\_\_\_ alone wouldn't cause an Ice Age. You would also need cooler summers for the snow and ice to persist.

There is evidence all around the world for \_\_\_\_\_ volcanic activity at the end of the Flood and several hundred years after as the catastrophic geologic processes were slowing down.

This volcanic activity would have released a continual flow of ash into the atmosphere, causing very cool \_\_\_\_\_ as the ash reflected \_\_\_\_\_ away from the earth.

As the earth began to \_\_\_\_\_ from the effects of the Flood, the building of glaciers would have slowed down as the \_\_\_\_\_ cooled and the ash became less in the atmosphere.

Eventually the \_\_\_\_\_ building would have stopped and began melting.

Some creation scientists have calculated that with the conditions right after the Flood, the full extent of the \_\_\_\_\_ could have reached its zenith as soon as five hundred years after the \_\_\_\_\_.

The amount of \_\_\_\_\_ would have built up huge ice deposits in the Sierra Nevada mountains and filled in Yosemite Valley with ice in just a few hundred years.

Because secular scientists refuse to include a catastrophic global Flood model into their research, they are left with trying to figure out an Ice Age \_\_\_\_\_ using current conditions . . . and the numbers just don't work.

From the valley to the high \_\_\_\_\_ at Yosemite, the current yearly mean temperature ranges between 25 to 90 degrees. The precipitation falls mostly in the \_\_\_\_\_ with nearly dry summers.

Average \_\_\_\_\_ is only 65.6 inches a year, and all of that is gone by the summer. For an Ice Age to build, you need snow staying on the ground year round.

For 3,000 to 4,000 feet of ice to develop, the conditions would have to have been drastically different in the past. Secular scientists still don't have a valid theory to explain these conditions, but the Bible does.

Science, it's awesome!

## **Evidence for Quick Melting of the Ice Age**

As large amounts of evaporation happened in the oceans right after the Flood, the oceans cooled and the evaporation slowed over the years. This cooling effect can be felt when you come out of a swimming pool on a warm day. You feel cold because the water is evaporating off your body.

Also, as lingering fine volcanic ash settles out of the upper atmosphere, the summers begin to warm.

When the ocean's evaporation slowed, the snowfall also slowed. Couple this with warmer summers and the advancing Ice Age eventually came to a stop. Instead, the great melting began, this time, at a much more rapid pace than it grew.

Creation scientists have run calculations and found the Ice Age could have disappeared in little as 70 years.

- As the ice melted, some of the water was trapped behind large inland lakes and ice dams.
- It is now widely believed by scientists around the world that a large ice dam near Sandpoint, Idaho, trapped very large amounts of melted ice water as the Ice Age was waning.



- The dam eventually broke and a huge wave of water went speeding across eastern Washington and through the Columbia Gorge.
- It made its way into the Willamette Valley, filling it with 400 feet of water, up to 40 miles wide and 100 miles long to the south near Eugene — over 300 cubic miles of water.

We know this because glacial erratics can be found all around the area. All of this water eventually left these valleys and emptied into the ocean, cooling it down even more.

**Use the numbers between 1 and 4 to order the events into the sequence that help reveal one ice age instead of many:**

- \_\_\_ As the fresh glacier water emptied and melted into the oceans, the colder fresh water would have sat on top of the warmer salt water for a while closer to the coasts, slowing down the evaporation and heavy storm development.
- \_\_\_ As more of these ice dams broke across the continents and brought more fresh cold water into the oceans over several decades, the seas eventually equalized into the current temperatures.
- \_\_\_ But after the fresh water eventually mixed in to the oceans, the surface temperature would have warmed back up and the large storms would have continued, only lesser in strength.
- \_\_\_ These intervals likely produced features which might look like multiple ice ages from the advancing and retreating of the ice sheets, but there was only one Ice Age with some minor forward and backward movement of ice.

## Why Just One

Secular scientists have estimated that four major glaciations have occurred in the Sierra Nevada Mountains. They also say there have been up to 40 ice ages over the last few million years.

Many of these ideas of multiple ice ages are due to preconceived assumptions loosely based on some of the advancing and receding of ice from the one major Ice Age.

Any “evidence” that they would claim for multiple ice ages is actually misinterpreted from small advances and retreats of the Great Ice Age.

During the Ice Age, massive sheets of ice moved down the valley, leaving scratch marks on the granite. We can use these scratch marks to determine which direction the ice moved.

Another evidence left behind by the Ice Age is the U-shaped valleys throughout Yosemite. As a glacier slowly moves down a valley, it smooths the edges and rounds the bottom of the valley.

A V-shaped valley is generally the result of water erosion, such as a river, while U-shaped valleys are the result of glaciation. We can observe these types of erosion happening today.

Eventually, all of the ice disappears and leaves these amazing sites which “declare the glory of God” according to John Muir.

### Discussion Questions:

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What are the differences between a U-shaped valley and a V-shaped valley?

## Bonus Activities:

- Look up “Missoula Flood”; what kind of dam was formed, and what happened when it broke?
- See if you can discover what “glacial erratics” are, why are they important to understanding processes like glaciers, and their impact on the landscape.

# Yosemite National Park: Conclusion

Yosemite is a testament to the Glory of God, but it’s so much more than that. It’s a display of quick catastrophic processes in its formation and erosion during and after the Global Flood.

From the radiohalos, to the quick formation of the Ice Age after the Flood that affected the park, the Bible gives us the best starting point to explain the evidence.

It didn’t take millions of years to form — just big events in a very short time period. When we use God and His Word as our history guidebook, what we see in nature starts to make sense.

If a secular worldview, which is based on man’s opinions, is used, explanations of nature will never quite fit. That’s why there is no agreement on how the Ice Age developed, because none of their ideas involve the catastrophic processes as described in the Bible.

When you build a puzzle, you build the outside edge first, then work to fit in the middle pieces. In much the

same way, we use the Bible as our frame, then begin to fit the inside pieces together. In the end, it all connects within a coherent and biblical worldview.

Sure, we don't know all of the details about the world we live in or its past, but we can discover and learn about God's world starting from His Word. That means working to understand every aspect of how this earth works and how it is explained best by a biblical worldview.

Science, it's awesome!

## About Zion National Park

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

Patriarchs	Arizona	crossbeds	Angels
sandstone	habitation	national park	flowing
bottom	references	cathedrals	Utah
understanding	challenges	Grand Staircase	Zion

The southwestern United States has many amazing and remarkable geologic sites, but one that is a favorite among visitors is Zion National Park in southern \_\_\_\_\_.

Zion is a part of the \_\_\_\_\_, a 10,000 foot series of sedimentary layers stretching from the bottom of Grand Canyon in \_\_\_\_\_ to Bryce Canyon in Utah.

Zion is a relatively small \_\_\_\_\_ compared to many, at 229 square miles and only 15 miles long.

The \_\_\_\_\_ layer of Zion is the same layer found at the top of Grand Canyon. So Zion Canyon could have been eroded before Grand Canyon. Zion became a national park in 1919, but \_\_\_\_\_ of the canyon by Native Americans goes back thousands of years.

The first permanent European-American settler in the canyon called his new home “Zion” because he felt, “A man can worship God among these great \_\_\_\_\_ as well as in man-made church.” (Psalm 2:6)

Many of the formations in the park have biblical \_\_\_\_\_ as the Great White Throne, the Three \_\_\_\_\_, and \_\_\_\_\_ Landing. They were named by Frederick Fisher, a Methodist minister.

In addition to the canyon, the east side of the park contains amazing rolling hills of sandstone \_\_\_\_\_ in an area called “Checkerboard Mesa.”

Standing over 2,000 feet tall, these are some of the highest sandstone cliffs in the world. The crisscrossing patterns are due to the layers being deposited in \_\_\_\_\_ water.

This valley has clear signs of the \_\_\_\_\_ being formed by water, then eroded by water.

\_\_\_\_\_ includes nine separate geologic formations which secular scientists think cover 150 million years of earth’s history.

Yet those who believe in long ages have some major \_\_\_\_\_ explaining the features we see at Zion, because a proper \_\_\_\_\_ of the evidence doesn’t mesh with their story.

Instead, astute researchers recognize the catastrophic formation of the layers and cutting of this enormous canyon. It wasn't millions of years, but perhaps just weeks. Zion is a towering example of geologic action due to catastrophic flood action, the biblical Flood of Noah's day. (Genesis 7)

## Formation of the Layers

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

- \_\_\_ As one meanders through the giant canyon, the walls of sandstone are enormous. The largest layer is the Navaho Sandstone, which is up to 2,200 feet thick.
- \_\_\_ This layer is known to cover over 140 square miles in the southwest.
- \_\_\_ The source of its sand grains can be traced to the northern Appalachians over a thousand miles away.
- \_\_\_ Secular scientists have suggested several ideas on how this sand moved across the continent. One is that an ancient river transported it from the northeast to the southwest, but no evidence exists for this grand waterway.
- \_\_\_ Another idea is that they were blown across by wind. But how did they miss being deposited in the Midwest as well? When the details surface, this idea is dashed and broken "against a big wall."

- Without a global flood model, secular scientists have a major challenge explaining how this much sand was moved this far away. But with worldwide catastrophic conditions during the Flood, the sandstones are easily explained.
- When sand is blown, the backside of a dune is typically more than 30 degrees. Also, if water moves sand, the backside of the dune is less than 30 degrees. This can be observed around the world and can be tested in the lab.
- None of the crossbeds in the Navajo Sandstone have angles less than 30 degree, therefore we can deduce that they were moved by water.
- Only one event in earth's history had the water and speed to transport 140,000 square miles of sand — the global Flood as told in the Bible.

## Cutting of Zion Canyon

When you tour through Zion Canyon, one question keeps entering your mind . . . how was this canyon cut? Whatever the process was, it had to work its way through thousands of feet of sediment.

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

receding	obstruction	remnant	small
water	receding	younger	gradually
gravity	cut	forces	collapsed
higher	features	hanging	directions
V-shaped	canyon	Virgin River	arches
intersection	Big Bend		

Secular scientists attribute Zion's erosion to the \_\_\_\_\_, which flows through the bottom of the canyon, over millions of years.

Just a casual glance reveals that the river flows too \_\_\_\_\_ to have caused this much erosion. The river doesn't even reach the canyon walls.

What is more, as one looks deeper into the canyon's \_\_\_\_\_, it becomes evident this place was \_\_\_\_\_ by a lot of water over a very short period of time . . . just days or hours.

One of the strongest evidences researchers use for a young cut \_\_\_\_\_ is how steep the canyon walls are. If the canyon was formed over a long period then \_\_\_\_\_, erosion, and other natural \_\_\_\_\_ would have caused these steep walls to collapse into the canyon in various places.

As a result, this valley would have been \_\_\_\_\_ with lots of debris. But there is very little debris on the canyon floor, which is a sign of a much \_\_\_\_\_ canyon.

In several places around the park, there are huge \_\_\_\_\_ high in the canyon walls. These in the sandstone will eventually erode away and fall to the canyon floor.



If the Virgin River took millions of years to carve this canyon, then these should have \_\_\_\_\_ and eroded away a long time ago, but they are still there. In addition, the park is full of \_\_\_\_\_ valleys.

These valleys are formed when massive amounts of water are moving through an area at high speed, cutting the landscape quickly from many \_\_\_\_\_, generally due to flooding conditions. Some valleys are \_\_\_\_\_ than others and spill into the lower ones.

When the floodwaters go away, the \_\_\_\_\_ of the upper canyons into the lower canyons are left hanging.

Zion is full of these giant hanging valleys. A huge amount of \_\_\_\_\_ moving together at the same time would be required to create these features.

If \_\_\_\_\_ streams, over long periods of time, were responsible for carving the hanging valleys, then they should have been eroded down or be completely gone. Yet they remain as a \_\_\_\_\_ of a global Flood when the \_\_\_\_\_ waters raced across the entire continent.

One of the features in the park secular scientists point to as evidence for slow and gradual erosion by the Virgin River is a place called “\_\_\_\_\_.” They say if catastrophic processes were at work, the \_\_\_\_\_ Flood waters should have just eroded this feature away.

We know that when flowing water finds an \_\_\_\_\_, it usually finds a way around it, and are usually found to be anything harder than the layer being eroded. The water finds a weaker point and goes that way. This is exactly what happened in Big Bend. And this is consistent with a biblical view.

You can make this simple observation at the beach. Watch how receding waves cut the sand. Most of the time they don't go in a straight line, but find the weakest point in the sand.

With all of these observable facts, the amount of water and speed of the water required to cut Zion, it is a testament to the Flood of Noah's day.

- After covering the entire earth, by day 150 the floodwaters were receding.
- As the continents rose and the ocean valleys sank, water ran off the continents first in sheets, then it began to channelize.
- When the water finally emptied into the oceans, it left these canyons. (Genesis 8:3; Psalm 104:7–8)

This whole area in the Southwest is full of large-scale erosional features. Secular scientists have a difficult time explaining all of these features through slow and gradual processes. The global Flood best explains what we see here at Zion and many other geologic features around the world.

The biblical record can be trusted. As we look at the geologic record, the evidence starts to make sense when a catastrophic global Flood is believed as a real historic event as described in the Bible.

### Discussion Questions:

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1. Why can't the Virgin River be the cause for Zion Canyon's formation?
2. How does the steepness of the canyon walls help to prove a younger time line for the canyon being formed?

3. If the canyon were older, would there be more or less debris on the canyon floor?

### Bonus Activity:

- Find photos of different valleys — see if you can find four examples of V-shaped and U-shaped ones.

## Noah on the Molalla

At your local natural swimming hole you might find something like this: a large shelf of sandstone with some cool erosional features. The sandstone was formed by water erosion. During the winter and spring this particular sandstone is covered in water. But in the summer it flows in a channel through the sandstone, giving us a miniature scale model of how Zion Canyon was formed.

How do these factors help explain how a canyon like Zion was formed?

- A big body of water behind this sandstone, which the river cuts around and through, forming channels.
- In these channels, you notice water runs pretty fast through them.
- The channels are pretty straight and the walls are almost vertical.
- There are also pebbles and rocks down at the bottom, instead of silt which a slow-moving river would leave.

If the water were to stop flowing through one of these channels, it would look much like Zion Canyon on a miniature scale.

Multiple channels like these give us an idea of how a process like sheet erosion happened first, making a flat surface. Then, when the water went down, it formed channels and cut through the rock making these canyons.

The channels start out narrow, then widen out into large pools.

There are places halfway through some channels where it becomes a big pool, then divides into two canyons.

If you look closely at the sandstone, there are also some cool erosional features that we see on a large scale in Zion.

Zion has many hanging valleys, like this one, on a miniature scale. If the water left this canyon, it would look like many of the hanging valleys at Zion.

As you look around the channels, you'll see these almost circular potholes that are caused by swirling water. We also see these features in Zion Canyon today.

Near the end of the channels, the water becomes faster and the erosional features more erratic. Then it drops off into a large body of water.

It didn't take a little trickle of water over millions of years to carve these erosional features.

### Bonus Activity:

- Look up what sheet erosion is. What are some reasons for it occurring?

### Discussion Questions:

1. What are four features of the channels in the sandstone that are similar to those of Zion Canyon?

2. How are multiple channels in the sandstone related to sheet erosion?

## **Zion National Park: Conclusion**

Through our study of the canyon, it's plain to see that the Bible's description of a catastrophic Flood event best explains the formation of the layers and erosion at Zion!

Secular scientists look at present geologic processes and say changes happened over long ages, like at Zion. They hold to this uniformitarian belief because they have a secular humanist worldview.

This worldview denies there is a God who created, and who delivers judgment against sin. If man does not have to be accountable to the Creator, then he can live any way he wants. The Bible tells us that it's by their own actions and thoughts that they hold to this worldview and deny the truth found in God's Word . . . not because of an unbiased view of the evidence. (2 Peter 3:3–7)

We can view the evidence starting with the truth of what the Bible says, and it matches up with quick catastrophic events. Zion shows God's great handiwork, but also His judgment.

The Bible tells us that God brought the global Flood because of man's rebellion against his Creator. Only one man was found righteous — Noah — and he was saved, along with his family. Notice the grace of God, God sent a means of salvation with the ark. (Genesis 6)

The Flood was real. The Bible can be believed.

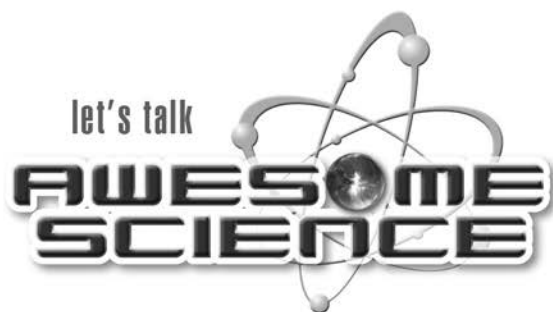
But there is also a warning to all of us. God's judgment is coming again, this time by fire. (Revelation 20:14–15)

The human race had over 100 years before the Flood to turn and repent of their rebellion. God is patient. He desires to see everyone repent of his or her sins and turn back to Him — for God has sent another means of salvation. (Genesis 6:3; 2 Peter 3:9)

If you have not turned to God through Jesus Christ, the Bible says, “Today is the day of salvation.” Repent and turn to Him now, before his judgment against man's rebellion comes again. (II Corinthians 6:2; NLT)

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Designed to make science fun, the *Awesome Science Series* is an educational and entertaining opportunity for everyone. Use this study guide for *Episode 4: Explore Yosemite and Zion National Parks* to display the knowledge the student has obtained by watching Noah as he traveled to the Southwest and discovered amazing evidence for the quick formation of the granite rocks at Yosemite during the Flood, as well as the evidence of how the massive sandstone layers were made at Zion.

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