

Landforms and bodies of water

Teacher's topic guide

God is Creator Year 7

Spiritual Awareness

God said, "Let the water under the sky be gathered together so the dry land will appear."

Dry land would provide a place for plants to grow. Then, God created the plants, which would become food, shelter and clothing.

God's greatness and majesty are seen in the landforms: mountains, valleys, glaciers, canyons, oceans and rivers. In the study of landforms, we also see natural disasters, such as landslides and volcanic eruptions. These disasters were not part of God's original creation, but are a result of the Fall. The Great Flood, an event displaying God's judgment upon sin, is the most amazing example of massive upheaval of the Earth's crust. Great landslides and swirling mud caused the deposition of layers, with plant and animals being quickly buried within them. These fossils, evolutionists falsely believe, were deposited over millions of years, when in fact, they were the result of one great disaster - the Great Flood, which occurred about 4000 years ago.

Values: Our response to 'God is Creator'

Because God is Creator I will:

- Trust God's word
- Believe in a miraculous God
- Know that only a miraculous God could create our beautiful world
- Know that God created me, and has a plan for me.
- Appreciate and care for God's creation, including people.

Outcomes: Students will

- Name and identify major landforms: mountains, hills, valleys, plains, plateaus, caves
- Name and identify different bodies of water: oceans, seas, lakes, rivers, streams, glaciers.
- Explain their formation.
- Explain the impact of the Great Flood upon world geography.
- Explain how erosion can change the shape of the Earth's surface.
- Explain how fossils were formed during the Great Flood.
- Explain what happened to the dinosaurs.

Bible stories:

Genesis 1 The creation

Genesis 6-8 The Great Flood

Bible Verses:

Psalm 93:4 The Lord rules...greater than the roar of the oceans, more powerful than the waves of the seas.

Psalm 95:4 He rules over the whole earth, from the deepest caves to the highest hills.

Psalm 98:8 Clap your hands you rivers, you hills; sing together with joy before the Lord, because He comes to rule the earth.

Key Questions

What do great mountains tell us about God as creator?

How did the Great Flood form the landforms we see today?

What do many people believe about the age of the Earth?

How old is the Earth? How do we know? (We can add up the years given in the Bible from Adam to Jesus.)

What are fossils and how were they formed?

What happened to the dinosaurs? (Dinosaurs were taken on to the ark as babies, so survived the Flood, but many probably died out during the Ice Age which followed the Flood. Dinosaurs are just an extinct species.)

Activities

- List all the different types of landforms students can think of.
- List all the different types of bodies of water students can think of.
- Examine and discuss pictures of landforms/bodies of water e.g. cape, gully, tableland, volcano, canyon, cliff, lake, river
- Identify landforms in the local area.
- Draw and label them.
- Make a model using a sand tray to depict different landforms.
- Use an atlas to find where landforms are situated.
- Locate the highest peak, largest bay, major rivers, in a particular country.
- Make a study of the Grand Canyon and see what creation scientists say about its formation.
- Identify other landforms created during the Great Flood.
- Discuss how erosion changes the shape of the Earth's crust and demonstrate by making an erosive model of the Great Flood. (See the Yr. 7 *Science Experiments*)
- Research the way in which layers were deposited during the Great Flood, burying plants and animals within them.
- Demonstrate how rocks can fold while soft, by placing a slice of white bread between two slices of brown bread. The three slices of bread represent three large sedimentary rock layers. Gently push the bread together from the sides until it forms a fold.
- Contrast evolutionists' view of geology, that the Earth is billions of years old, with the creationists' view, that the Earth is 6000 years old according to the Bible.
- Discuss the composition and processes at work in volcanoes.
- Explain the meaning of active, dormant and extinct volcanoes.
- On a map, name and locate volcanoes that are still active.
- Construct a model of a volcano.
- Examine volcanic rock.
- Research accounts of Mt. St. Helens, Pompeii and Krakatoa eruptions.
- Draw and explain the formation of glaciers.
- Identify some famous glaciers in an atlas.
- Research the expedition of Sir Edmund Hillary, the first person to climb Mt. Everest.

Assessment

1. Present research on one type of landform or body of water.
2. What have I learned from studying geology...
 - about the way in which the great Flood caused the Earth to change the shape of its surface?
 - about God as a powerful creator?

Research cards: Landforms and bodies of water; Dinosaurs

Thinking skills: Rivers and glaciers

Biography: Usaia

Values education Year 7

God is Creator

Gratitude

Gratitude is...

- Expressing appreciation for what someone has done
- Being grateful for all we have
- An attitude of thankfulness

Activities

1. Make a list of everyone who does things for you.
2. Start a "Gratitude Diary" and each day, write in it one thing you are grateful for.
3. Write a card or letter of gratitude to three people, and say why you are grateful to them.
4. Discuss whether we should have an attitude of gratitude if things don't seem to be going well for us.
5. Write a prayer of thanks to your Creator.

What does the Bible say about gratitude?

1 Thessalonians 5:18 Give thanks in all circumstances

Psalms 136:1; Psalm 107:1 Give thanks to the Lord for He is good

Psalms 103:2 Bless the Lord O my soul, and forget not all His benefits

James 1:17 Every good and perfect gift is from above.

Art Year 7

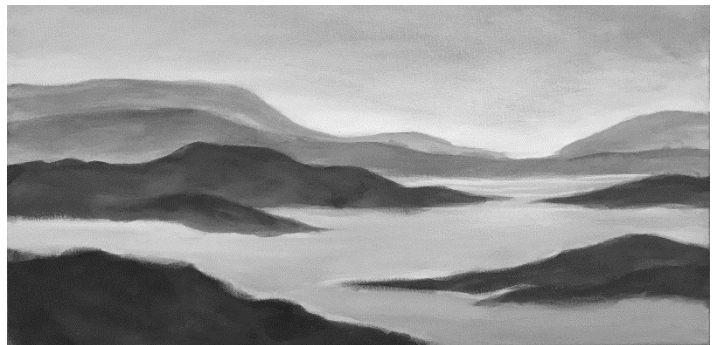
Landforms and bodies of water

God is Creator

Biblical wall art and text: In his hand are the depths of the earth; the heights of the mountains are his also. The sea is his, for He made it, and his hands formed the dry land. Psalm 95:4-5

Painting and drawing

Scenes of mountains, valleys, lakes and rivers
Pastel can be used with interesting effects



Sea and skiescapes



The Great Flood



Modelling

Use paper mâché to create a 3D model of a volcano.



Practical Science year 7

Landforms

Limestone caves: stalactites

<http://www.kidspot.com.au/kids-activities-and-games/Science-experiments+10/Stalactite-experiment+10982.htm?>

This experiment will keep the students intrigued over the 2-3 weeks as they watch the change taking place.

What you need:

- two glass jars
- baking soda
- spoon
- string
- paperclips
- water
- saucer

What to do:

Fill the two jars with hot water.

Add as much baking soda as will dissolve to each jar.

Mix well.

Cut a piece of string and tie a paper clip as a weight to each end.

Dip each end into each jar.

Place a saucer between the jar to catch the drops.

Leave the jars for 2-3 weeks and a stalactite will grow!

Why is this happening?

The baking soda mix is carried through the string and drips into the saucer.

Over time the dripping water evaporates forming a tiny stalactite and stalagmite.

Practical Science

Landforms

Make your own volcano

<http://www.sciencebob.com/experiments/volcano.php>

What you need

- A volcano made ahead of time. This can be made out of paper mache or plaster. You can also use clay or if you're in a hurry to make your volcano, use a mound of dirt outside.
- A small plastic container
- Red and yellow food coloring (optional)
- Vinegar
- Liquid dish washing soap

What to do

1. Go outside or prepare for some clean-up inside
2. Put the container into the volcano at the top
3. Add two spoonfuls of baking soda
4. Add about a spoonful of dish soap
5. Add about 5 drops each of the red and yellow food coloring

Now for the eruption!

6. Add about a tablespoon of the vinegar into the container and watch what your volcano come alive.

How does it work?

A volcano is produced as heat and pressure build up beneath the earth's crust. That aspect of a volcano is very difficult to recreate in a home experiment. However this volcano will give you an idea of what it might look like when a volcano erupts flowing lava. This is a classic experiment in which a CHEMICAL reaction can create the appearance of a PHYSICAL volcano eruption.

The reaction will bubble up and flow down the side like a real volcano (only much faster).

Make it an experiment

The project above is a DEMONSTRATION of how heat and pressure are at work in a real volcano. To make it a true experiment, you can try to answer these questions:

1. Does vinegar temperature affect how fast the volcano erupts?
2. Does the shape of the volcano affect the direction the eruption travels?
3. What can be added to the "lava" to slow it down and make it more like real lava?
4. What combination of vinegar and baking soda creates the biggest eruption?

Practical Science

Landforms

Make Your Own Fossils

http://www.madaboutscience.com.au/store/index.php?main_page=page&id=52

Fossils are the remains, impressions or traces of ancient animals or plants, which have been preserved in the earth's crust for thousands of years. You can make your own fossils from things you find at the beach or in your garden.

What you need:

- 1/2 cup of flour
- 1/4 cup of salt
- 1/4 cup of sand
- Water
- Mixing bowl and spoon
- Fossil Objects (sea shells, leaves, or other small objects)
- Optional: Plaster of Paris, store-purchased clay

What to do:

1. To make your authentic-looking dough, mix all the dry ingredients together in the bowl.
2. Add water a little at a time until you have a thick dough. It needs to be about the right texture – not crumbly, but not too wet and sticky either.
3. Knead the dough with your hands, and then flatten it on your work surface. It needs to be a couple of centimetres thick.
4. Carefully press your fossil objects into the clay until you get good impressions, then remove them.
5. Let your clay fossil dry thoroughly for a few days.

About fossils

Fossils give us a window into the past. They are remains of past life preserved in rock, soil or amber. Most fossils we find today are fossils of plants and animals that were buried quickly during the Great Flood, about 4000 years ago. Generally, the remains were once the hard parts of an organism, such as bones and shell, although very occasionally soft tissues also fossilize. There are different types of fossils – trace, mineralised fossils, impression fossils – because remains can be preserved in a variety of ways.

Practical Science

Landforms

Make a model of the Great Flood

What you will need:

- A bucket
- Water
- Sand
- A flat board smaller than the diameter of the bucket

What to do

Fill a bucket with two-thirds water.

Put sand on a flat board that is smaller than the diameter of the bucket.

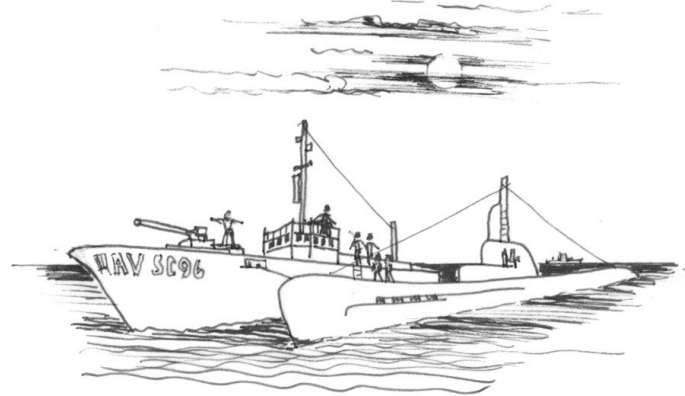
Slowly submerge the board then gently lift it.

What is happening?

This demonstration shows the erosion of sediments when the continents were uplifted out of the flood water.

Usaia Sotutu

Biography



The chiefs of the Bua area on Viti Levu, Fiji were considering which students from their village primary schools should be selected to progress to Queen Victoria School, which was the government secondary school. It was the year 1919.

“We have some very good students, but I believe Usaia Sotutu is the most outstanding,” observed the chief of the Tavea area. “The teacher there often speaks of Usaia as the brightest student he has ever taught.”

So it was agreed that Usaia would join the group of boys who would, in the following year, progress to the first year of the best government primary school in Fiji. Usaia felt honoured to be chosen. There were very few good primary schools in Fiji at the time, so he was very pleased and looked forward to his new school the following year.

One day he and his friends were out in a canoe on the sea when suddenly a storm blew up. A strong gust of wind overturned their canoe, throwing all the boys into the rough water. Fortunately some men in a canoe nearby saw them, came to their rescue and they were saved from drowning.

Usaia knew they had been in serious danger and that they would have drowned if the men in the canoe hadn’t rescued them. When he reached the shore and had time to think about this episode his thoughts turned to God, for his parents had trained him to follow in the Christian way.

“Thank you, God, for sending those men to rescue us.” he prayed... “I promise I’ll do whatever you tell me to do from now on. I want to serve you for the rest of my life.”

From that time on Usaia began to have a sense that God was speaking to him and the message he was hearing did not please him at first. It seemed God was saying, “Usaia, I don’t want you to go to Queen Victoria School. I want you to go to the Methodist School at Davuilevu.”

Never before had he been so sure this was truly God speaking to him, not just his imagination. Some weeks before the start of the new school year Usaia went to his parents, “I know the

chiefs have chosen me to go to Queen Victoria School," he began, "but since I was rescued from that boating accident God has been speaking to me."

"What has He been saying?" His father asked.

"God is telling me I should go to Davuilevu instead of Queen Victoria School. I made a promise to God after I was rescued from the sea that I would do whatever He wanted me to do."

"Then you'd do well to keep your promise to God," said his father. "It's more important to obey God than anyone else."

So Usaia's father visited the local chief to explain the situation and Usaia prepared himself to attend the Methodist Mission's Industrial School at Davuilevu. His mother proudly prepared new shirts, sulus and sandals for him and wove him two beautiful mats for his bedding and for carrying his things in. His father bought him a brand new cane knife and a file to sharpen it. This was essential equipment for all students to cut grass and firewood and work in their food gardens. Clothing and all other necessary articles were packed carefully into the mats, folded into neat bundles and tied with bush string. The week before Usaia was due to enter his new school he and his father set off from Tavea, each with a mat bundle slung over a shoulder. They followed a track around the coast to Nausori, and then climbed a hill to reach the Davuilevu compound.

After enrolling Usaia they found their way to the dormitory he would share with twenty other boys. Some mosquito nets had already been hung up in long open building with its shutter windows. Usaia unpacked his mats and placed his few possessions on his allocated shelf. His father waited until his son was settled then said goodbye. "It will be only twelve weeks until you come home for holidays. We'll look forward to that time. God bless you, my boy." And he was gone.

Usaia soon made friends with the boys around him and made the most of his opportunity to learn. Besides the academic subjects the boys were taught carpentry and mechanics. This equipped them for building houses, making furniture, running a mission boat or an engine to produce power for lighting on a mission station, among other things. Along with the industrial training there was a Bible and pastoral training course to prepare the men for Christian leadership.

During Usaia's time at Davuilevu Dr. George Brown from the Methodist Mission office in Sydney, Australia, visited Fiji and spoke to all the students. He was recruiting volunteers to go to the new mission stations in New Guinea and the Solomon Islands. Usaia was 19 years old at the time and his heart was stirred. He went to speak to Dr Brown.

"I'd like to offer to go as a missionary to a new mission station, sir. I know I'm young, but I believe God is speaking to me so I have come to volunteer."

Dr. Brown encouraged Usaia to complete the training he was doing at Davuilevu, then he would be welcome to join the mission staff. In 1921 he went out as a single man to the Western Solomons first, then transferred to Skotolan, Buka, a small island just north of Bougainville. He was mission boat engineer and general assistant for the Solomon Islands Methodist Mission, so his technical training served well.

Usaia's co-worker was Allan Cropp from Australia. They were a good team and worked together very happily. Together they built a large house for use in their mission work; it was partly Fijian and partly local in design. They were both able to adapt to their situation, learning how to include the local people in their building projects.

Usaia quickly learned the language of Buka, which was used in their churches, the Petats language. He wrote a book of stories about Jesus in Petats for the children to read in the mission schools. He was also a 'barefoot doctor', able to use the small quantity of medical supplies that were available. But he was also familiar with the 'bush medicine' used in Fiji and was able to find similar remedies in the bush on Skotolan. Fijians are skilled in massage and Usaia was also able to use these skills on injured people from time to time.

When Usaia was preparing for leave after his first term of missionary service, Allan Cropp gave him a piece of good advice. "My friend," he said, "while you are in Fiji you must find yourself a wife."

Usais met Makereta, a gifted teacher and strong in the Christian faith. She and Usaia were married in Fiji and went back together to serve on Bougainville. Makereta taught in the mission school and translated Bible stories into Petats. She taught the women and girls the Fijian crafts of weaving mats and baskets, methods of gardening and food preparation.

Usaia and Makereta had five children - two boys and three girls. Makereta loved to sing hymns and pray. This strength in both Usaia and Makereta helped them to survive the years of testing when the Japanese entered the war in the Pacific in 1941.

As the Japanese infiltrated the islands from the north, ships loaded with Japanese soldiers wove their way south establishing bases on islands in strategic places. Noisy, threatening planes screamed overhead, dropping bombs. The people living in the coastal towns and villages packed up their few possessions and fled for protection to the dense mountain jungle. Usaia knew the jungle as well as any local person and he became leader of a 'spy-ring', the 'coast-watchers'. A handful of Australian soldiers were stationed in a strategic spot at the top of the mountains with a radio transmitter. Usaia posted the message-bearers at intervals of 2 or 3 miles from the coast right up the mountain to the radio operators post. Information about enemy placements was passed from the coast-watchers to message-bearers who relayed it up the mountain to the Australian radio operators. The location of placements was made easy by the provision of United States Air Force grid maps. The signalers on the mountain top received the information and were able to pass it on to military Headquarters. The following night U.S. bombers would target the enemy sites reported to them the day before.

Usaia became a 'wanted man' by the Japanese, so when they bombed Buka and his coast-watching activities began, he said to Makereta, "It's not safe for you and the children to be with me. The Japanese want to capture me. You take the children and go up into the mountain jungle in the centre of Bougainville Island. There are many of our friends staying there, you will be safe with them. I must help the allied forces against the Japanese."

Usaia and Makereta were separated by distance, but they remained one in spirit. They both had dreams and intuitions given by God that brought direction to one or the other of them. They found on many occasions that they both received the same guidance through dreams or in prayer as to where to go and what to avoid.

They managed to survive the hazards of living in the jungle until the end of 1942, when orders came for Makereta and the children to prepare to be evacuated by submarine. But they were delayed and the submarine left without them. They continued their jungle existence for three or four more months when another message came, "A submarine will be in Kekesu harbour on Sunday night. Makereta and the children must be ready to be evacuated on it." Kekesu is on the north coast of Bougainville.

This meant a long and hazardous climb down the mountain and a wait in the dense jungle in sight of the harbour. To their dismay a Japanese boat was anchored in the exact spot where the submarine was to pick them up. They waited all day and through the night until Monday morning, expecting to see Japanese troops land, but nothing happened and the enemy ship moved on.

There were sentries posted every half-mile along the coast, watching to report any sightings of Japanese. When they concluded it was safe the evacuees boarded the submarine. There were 12 Australian soldiers and 36 civilians including Makereta and the children, who boarded the submarine which left on the Monday evening. During the night the submarine surfaced, but traveled under water during daylight hours. On Wednesday evening an American sub-chaser came alongside the submarine. Under cover of darkness, one by one the evacuees were passed from one crew member to the next until all 48 evacuees were transferred from the submarine to the sub-chaser. There were Japanese vessels everywhere and the rescue ship had to weave around and circumnavigate islands to avoid detection by the enemy. They arrived at Honiara, on Guadalcanal, on Thursday morning, relieved to have come safely this far.

After the evacuees had waited three weeks sheltering in the bushland near Honiara a large convoy of ships was sighted sailing into the harbour. There had been a rumor around the islands that there was a contingent of Fijian commandos coming to support the US and Australian troops. Everyone watching the ships felt growing excitement at the thought that relief was near, especially the Fijians who were pleased that their fellow countrymen were in the relief party.

That night every populated centre around Guadalcanal was heavily bombed by the Japanese but the people sheltering in the jungle escaped air attack. While they waited in Honiara, Makereta and the children met a relative, Sergeant Joe Kindon, who was a commando in the first contingent to come from Fiji. This contingent was now preparing to return home to Fiji, having completed their term of service in the Guadalcanal area. Joe needed to go back to the gold mine in the mountains to get some personal possessions he had left behind there. Makereta's second child, Paul, aged 9 years, spoke up at once, looking pleadingly at his mother. "Please may I go with him?"

“It should be safe enough, I think,” Joe said, “I don’t expect there will be any Japanese up there. I’d be happy for him to go with me. I promise to look after him.”

On Sunday morning Paul and his uncle Joe set out for the gold mining camp in the mountains. It proved to be far more hazardous than Joe expected. There were enemy troops everywhere, making it necessary for them to hide frequently to avoid being captured. However they did get through to collect Joe’s goods without being detected and arrived back at Honiara on the Wednesday morning, as planned.

In the meantime, on the Monday night, Makereta and her children were ordered to board the submarine along with the other evacuees who had left Bougainville with them.

“What about my son, Paul?” she asked. “He’s still away in the mountains with his uncle.” “We’ll look after him,” the authorities assured her. “We’ll see he is on the next vessel leaving Honiara. You look after the four children with you. We’ll see Paul is safe.”

With a prayer to God for Paul and Joe to be kept safe, Makereta and the four children boarded a submarine to be taken to Noumea, New Caledonia. It was at times like this when Makereta’s faith in God kept her from undue worry and made her an inspiration to those around her. Eventually a submarine took them home to Fiji where they landed, very relieved to be out of the danger zone.

Paul spent the next three weeks in a military camp on Guadalcanal staying with his uncle, Joe, waiting for the next opportunity to escape from the war zone around Bougainville. It came three weeks later, when a US troop ship sailed into the harbour, A Fijian evacuee was assigned to look after Paul who became the mascot for the troops and civilians on the ship. He wore shirt and shorts that his mother had made from parachute silk. And he carried a small .22 rifle with which he killed rats. (It was reported wrongly in the U.S. that he killed Japanese soldieris with it!)

They sailed first to Noumea, New Caledonia, where they disembarked. After waiting there for two weeks, another troop ship arrived which was going to Fiji. The last leg of the journey home to Fiji was uneventful. After stopping at Lautoka to drop off some passengers, Paul was welcomed home in Suva a few days later by a very relieved mother.

Usaia returned to Fiji for a short time, but three months later he was recalled by the commander of the allied forces on Bougainville. He had such an intimate knowledge of the jungle tracks and of the allied forces in the Pacific that his services were considered indispensable.

After the allied forces had landed at Torokina, on Bougainville they prepared to build an airstrip high up in the mountains. Usaia Sotutu was given the task of choosing a suitable site and suggested a position on a small plateau high up on the side of the mountain. Five hundred men in a battalion of Fijian commandos were assigned to go up, clear the ground of all growth and prepare the airstrip. They were not expecting any enemy attack, believing the Japanese knew nothing about it, so they were only lightly armed. However, a local man, who was helping the Japanese, betrayed the Fijians and reported the allied forces’ activities at the airstrip to Japanese headquarters on Bougainville.

The Japanese were elated. Not long before this, in the Western Solomons, the Fijian commando force had completely routed the Japanese. Now they could see a way to have revenge on the Fijians. Posting large groups of soldiers all around the mountain below the airstrip, they blocked off every exit point they could find from the coast up to the air strip. The allied commanders were distressed. "There's no way we can get those men out They're completely surrounded by the enemy. We'll lose every one of them," they cried.

Usaia heard of their dilemma. He went to the US officer in command. "I can get the men out, sir," he said with great assurance. "I know every track on the whole of these mountains. If they close off ninety-nine exits I'll find the hundredth one. At least let me have a try."

Usaia spoke with such confidence that the officer finally relented. Usaia was sent off in a small, light plane, and dropped off quickly on to the roughly-finished airstrip. The plane quickly took off again. "I'll lead you and your men out of here, sir," Usaia assured the Fijian officer in charge, "but first we must pray for God's protection as we go."

Usaia prayed for the safety of the men, their protection from the enemy and commended the whole exercise to God. As they began their exit torrential rain poured down. This was the very best means of protection for them, reducing visibility and covering their tracks as all 500 men followed Usaia single file out from the airstrip to safety. They crawled through heavy undergrowth, slipped on wet rocks and waded through swollen streams, following Usaia on a trail few people had any knowledge of. For a week nobody heard anything of them.

The Japanese forces surrounding the airstrip attacked, and were astounded to find the place quite deserted. How could those Fijians possibly get past the huge number of troops they had watching every track through the bush? Usaia's detailed knowledge of the bush tracks, combined with his trust in God, had performed the miracle.

When the Fijians did eventually arrive back at their camp in the jungle near the coast, the commanding officer listened to their story in amazement. He was full of praise for Usaia and wrote a report recommending he be awarded the Victoria Cross, the highest British military honor. Unfortunately that citation was lost in transit and the award was never made.

When the war was over Usaia returned to Fiji for a time, then he and Makereta returned with the two youngest children to help rebuild the war-torn Methodist Mission in the northern part of Bougainville They served a three-year term before returning home to Fiji because of Usaia's poor health. After a time of recuperation, he was able to return to active work in the church in Fiji. He had been ordained into the Methodist ministry in Bougainville, some time before World War 11, so back in his home country he continued in ministry, serving his people and his God faithfully. He died in 1983.

On their return to Fiji, Makereta went back to teaching, continuing to use her Christian leadership gifts until her death in 1992, at the age of 84.

Usaia and Makereta were much loved and respected by everyone; they lived out their faith in God amongst their people. Their children rise up and call them blessed.

Thinking Skills Creator Yr 7

<p style="text-align: center;">River, glaciers and water cycle 1</p> <p style="text-align: center;">Name 5 things that</p> <p style="text-align: center;">a river and a car tyre</p> <p style="text-align: center;">have in common.</p>	<p style="text-align: center;">Rivers, glaciers and water cycle 2</p> <p style="text-align: center;">Work out 3 ways to move a small boat through the water without oars or a motor.</p>
<p style="text-align: center;">Rivers, glaciers and water cycle 3</p> <p style="text-align: center;">Try to justify this statement: “Children should be banned from swimming in rivers”.</p>	<p style="text-align: center;">Rivers, glaciers and water cycle 4</p> <p style="text-align: center;">List 10 things that should NEVER be placed in water.</p>
<p style="text-align: center;">Rivers, glaciers and water cycle 5</p> <p style="text-align: center;">The answer is</p> <p style="text-align: center;">“The water cycle”.</p> <p style="text-align: center;">Give 5 questions.</p>	<p style="text-align: center;">Rivers, glaciers and water cycle 6</p> <p style="text-align: center;">Draw a water tank. Now redesign it by using the following steps:</p> <p style="text-align: center;">B – bigger I – instead of N – nonsense G – get rid of O – other uses</p>

Thinking Skills Creator Yr 7

<p>River, glaciers and water cycle 7</p> <p>How many ways could you collect rain water?</p> <p>Give 5 completely different ways.</p>	<p>Rivers, glaciers and water cycle 8</p> <p>Design a machine to catch fish in a river.</p>
<p>Rivers, glaciers and water cycle 9</p> <p>Some glaciers around the world are melting.</p> <p>Give some 3 possible reasons for this.</p>	<p>Rivers, glaciers and water cycle 10</p> <p>Design a machine for collecting water using the same principles as the water cycle.</p>
<p>Rivers, glaciers and water cycle 11</p> <p>In one part of the country there is often drought, while in another part of the country there are often floods.</p> <p>Work out ways to help both situations.</p>	<p>Rivers, glaciers and water cycle 12</p> <p>The water catchments are low due to drought.</p> <p>Brainstorm 10 ways that the population can help to conserve water.</p>

Landforms and bodies of water 1

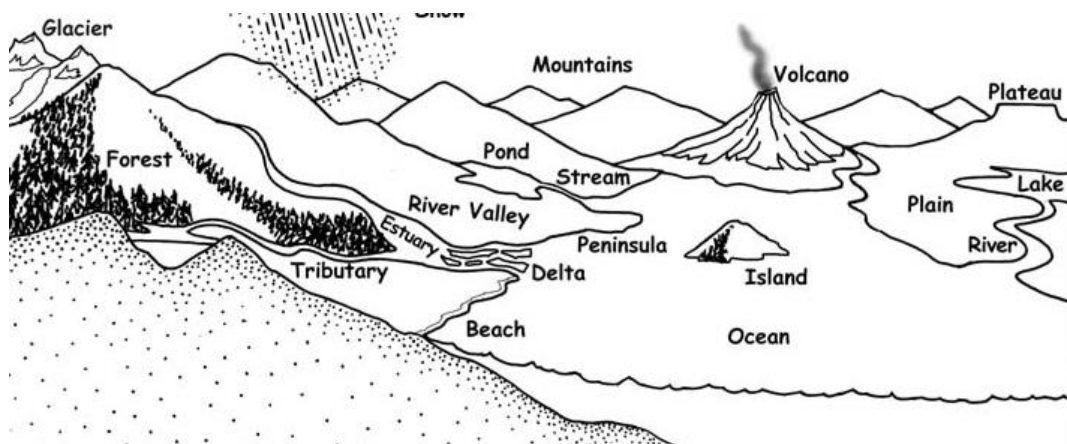
What Are Landforms?

A landform is any natural formation of rock and dirt, found on Earth. A landform can be as large as a mountain range, or as small as a hill. It can be as large as a continent, or as small as a pond. Geologists study how landforms are created, and how they interact with one another.

One quarter of the earth's surface is covered by land. At some places the land may be very high, at some places very low. Any shape on the earth's surface is known as a landform. The various landforms that we have, came into existence due to natural processes such as erosion, wind, rain, and weather conditions such as ice. Natural events and disasters such as earthquakes, volcanic eruptions and floods created the various shapes of the land that we see. The greatest natural disaster in history was the great Flood, in Noah's time, which covered the whole earth.

Some examples of landforms are mountains, hills, valleys, plateaus, plains and deserts.

Draw a picture of a landscape with different landforms and bodies of water. Label them.



Landforms and bodies of water 2

Facts about Mountains

A mountain is the highest landform on the surface of the earth. It is usually found to be cone shaped with steep sides and a pointed tip called a peak. A mountain range is a series of mountains.

Mountains could be steep and snow covered or they could be gently sloping having rounded tops.

The highest mountain range in the world is the Himalayas. Mount Everest is the tallest mountain in the world. Some mountains are found under the sea and could be taller than the Mount Everest.



1. What is a mountain peak?
2. What is a mountain range?
3. What is the highest mountain in the world?
4. Draw some different types of mountains.

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How mountains formed

Mountains can be folded, volcanic or block.

The earth's crust is made up of plates. Sometimes the plates move towards each other.

Layers of soft rock below the earth's surface are squeezed up to form mountain ranges.

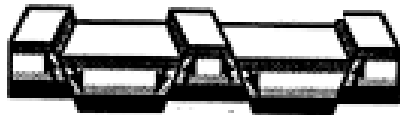
Mountains can form when molten rocks from deep within the earth rise to the surface, pouring out in the form of lava from volcanoes.

Block mountains were formed when part of the land drops because of an earthquake.

During the Great Flood, all of these things happened.



Volcanic mountains



Fault-block mountains



Folded (complex) mountains

1. Draw four different types of mountains and label them.
2. Explain how each type was formed.

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Plants and animals living in the mountains

There are many mountains that remain covered with snow throughout the year. These mountains are very cold. Therefore, there is not much vegetation or life found in here. Trees like pine trees are found in the lower ranges or foothills.

Animals that have a thick fur coat can survive the extreme cold in the high mountain regions. The yak, the mountain puma, snow leopard or the mountain goat are some of the animals found in mountain areas.

Mountains are very useful to us as they act as shields for the country blocking the cold winds and also protect us from invading enemies.

Trees provide us with commercial and medicinal value.

Melting snow from the snowcapped mountains fills the rivers and they are a source of water.

Mountains make beautiful tourist destinations.



1. Why is there no life on snow-covered mountain tops?
2. What kind of tree grow in the lower foothills?
3. Name and draw some animals that live in mountain areas.
4. Why are mountains useful to us?

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Facts about Hills

Hills are lower than mountains but are higher than their surrounding areas.

Hills are lower in height than mountains, but they are higher than the surrounding areas. A number of hills together form a 'range of hills'. Hills are usually covered with grass.

The climate in the hills is more pleasant than the climate in high snow covered mountains. It is usually neither too hot nor too cold. They make perfect tourist destinations.

The vegetation is thick, beautiful fruit orchards are found in the hills and it is good for crop cultivation like tea and coffee.



1. What is the difference between mountains and hills?
2. What kind of agriculture can be found in hills?
3. Why are hills often good for growing things?

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Facts about Valleys

Valleys are the low-lying areas between two mountains or hills.

When rivers flow down the mountainsides and hillsides, it wears off the rocks and soil.

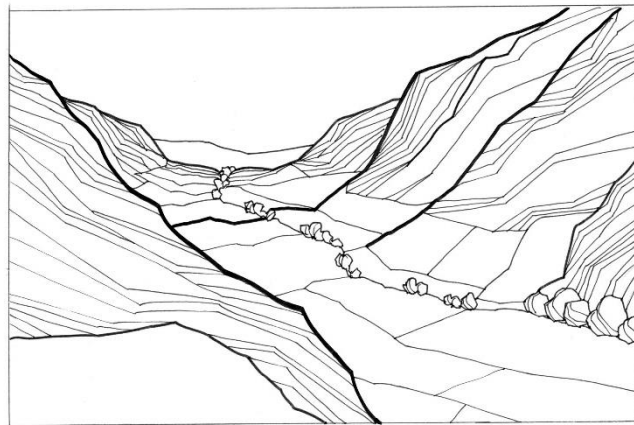
Valleys are formed when water carves out grooves. These grooves get deeper and wider, forming low land areas called valleys. During the Great Flood streams of water rapidly carved out valleys.

Valleys formed by glaciers (rivers of ice) are U- shaped.

Valleys formed by fast-moving rivers or streams are V – shaped.

Narrow valleys are called canyons.

The climate in the valleys is cool and pleasant. Many civilizations in ancient times were found in valleys where there were rivers flowing making water available for the people. Due to ample water that is provided by the rivers and fertile soil, the vegetation is thick and valleys look green and beautiful.



1. What are valleys?
2. Draw and label three different types of valleys.
3. How did the Great Flood form valleys?

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Plateaus and plains

A plateau is a flat-topped highland with steep sides. Since it looks like a table, it is also called a tableland. They are basically areas of high flat land. Plateaus are usually surrounded by steep rock faces called cliffs.

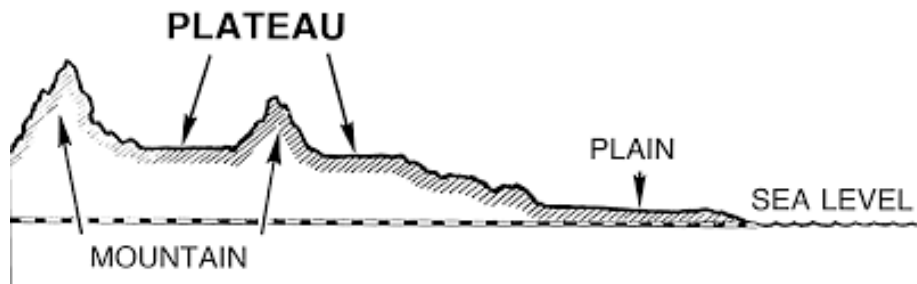
Plateaus are usually good for growing certain crops.

Plateaus are formed when magma pushes up towards the surface of the earth's crust. This magma does not break through but it raises a portion of the crust up creating a plateau.

Plains are areas of flat land. The plains usually meet the oceans or seas, these are called coastal plains.

Some plains are formed by the action of rivers, these are called river plains. River plains are very fertile and good for growing crops.

You will find most big cities are located in plains. This is because it is easier to build houses, buildings, roads and other structures in the plains. They are therefore heavily populated.



1. What is a plateau?
2. What is a plain?
3. Draw a plateau and a plain.

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Facts about Islands

An island is a piece of land surrounded by water on all sides.

Islands can be large or small. The continent of Australia is a large island. Fiji is made up of many small islands.

Coral islands are formed when coral piles up over a long period of time.

A large group of islands close to each other together form an archipelago. The largest archipelago in the world is Indonesia.



1. Name a very large island.
2. Name a very small island.
3. What is a coral island?
4. What is an archipelago?
5. Name an example of an archipelago.
6. Draw a map of Indonesia.

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Deserts: Facts and Types

Deserts are large, dry and hot areas of land which receive little or no rainfall throughout the year. The vegetation is scanty due to the shortage of water. Deserts are covered with sand. Sand dunes are huge hills of sand formed by the winds.

Deserts have extreme weather conditions. Days could be very hot and nights very cold. This is because the sand absorbs heat fast during the day and gives off heat quickly at night.

The main vegetation found in the deserts are the cacti and the baobab trees. The baobab tree can store nearly up to 1000 litres of water in its trunk which enables it to survive the harsh conditions.

There are two types of deserts – Hot Deserts and Cold Deserts.

Hot Deserts

Hot deserts are vast areas of land that are covered with sand and dust. These areas receive little or no rainfall and are very dry.

The animals found in the hot deserts are camels, snakes, lizards and rats.

Cold Deserts

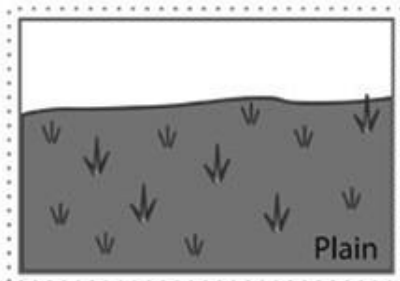
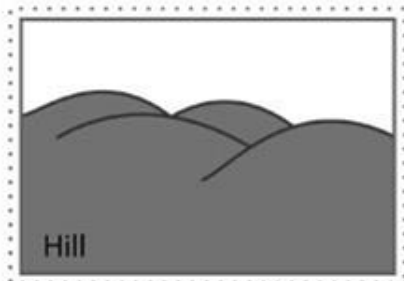
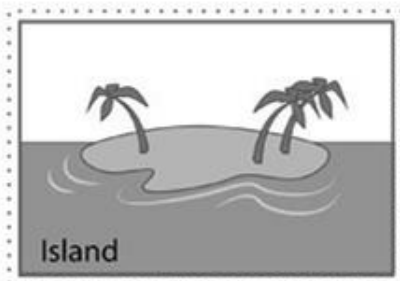
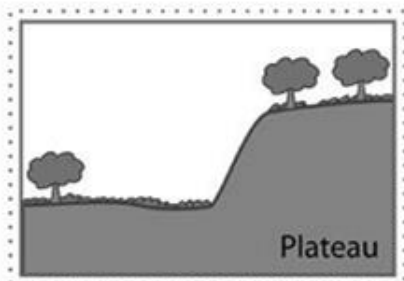
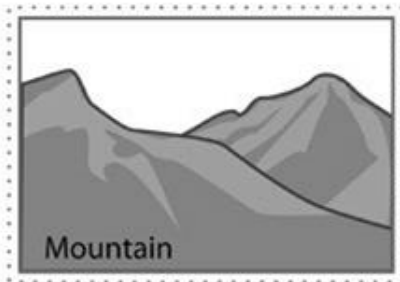
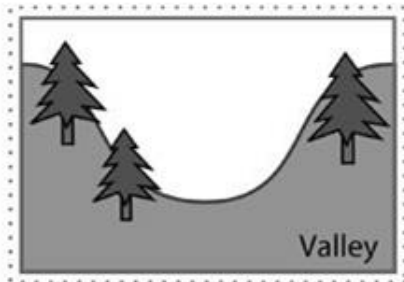
The cold deserts are large areas of land covered with snow. These deserts receive little or no rainfall. They receive snowfall during the winters. Animals such as penguins, whales and fur seals survive in the cold deserts. The Antarctica is the world's biggest cold desert. Life in these cold deserts is impossible.

Write a description of either a hot desert or a cold desert. Use both words and drawings. Also name the place.

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Types of landforms: definitions

Draw and write a definition for all of the following landforms:
Valley, mountain, plateau, island, hill, plain.



Landforms and oceans 11

Earthquakes

These natural disasters can change the shape of the earth's crust. An earthquake is the sudden and violent shaking of the ground caused by shifts in the earth's crust.

A Tsunami is an ocean wave caused by an earthquake on the bottom of the ocean.

During the Great Flood, earthquakes were much, much larger and more frequent than any we see today. An earthquake today might move the land up, down, or sideways by about 6 metres. An earthquake during the Flood may have moved the earth 3 kilometres or more.

Tsunamis during Noah's Flood would also have been much larger than any Tsunami today. Noah's Ark, in the middle of the ocean, would have just moved up and down a bit, but when tsunamis reached the land, they would have become waves of hundreds or even thousands of metres tall.



1. Describe the earthquakes and Tsunamis during Noah's Flood.
2. What effect did they have on the earth's surface?

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Volcanic eruptions

God says, “the fountains of the great deep burst open, and the floodgates of the sky were opened.” (Gen 7:11)

The fountains of the great deep were broken up by earthquakes and Tsunamis. This would have caused thousands of volcanoes to erupt.

Deep inside the earth it is very hot. Liquid rock, called magma, within the earth would have been released by the cracking of the earth’s crust. Volcanic eruptions not only spew out hot liquid rock, but also ash, gases, and fluffy rocks called Pumice, high into the air. All of the rock and ash from the eruptions would have eventually fallen back to earth into the floodwaters and become part of the layers of mud, which eventually formed a soft type of rock called sedimentary rock.



1. What happens during a volcanic eruption?
2. What cause the many volcanic eruptions duding Noah’s Flood?

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A Global Flood

Some people do not believe that Noah's Flood covered the whole world. They think that the Bible is talking about a small flood somewhere near the Middle East, because we know that the Ark landed on Mt. Ararat in the Middle East. But we can observe a huge amount of geological evidence that the Flood really covered the whole earth, and this is confirmed in the Bible.

The purpose of the Flood was to cleanse the earth of all the people in the world who had fallen into evil practices. Noah was instructed to save the animals by taking aboard two of every kind. It would not make sense for God to command the animals and Noah to repopulate the earth after a local flood, because the animals and people would already be elsewhere and still alive.

The Bible says that after 73 days of being grounded on Mount Ararat, Noah saw the tops of the other mountains.

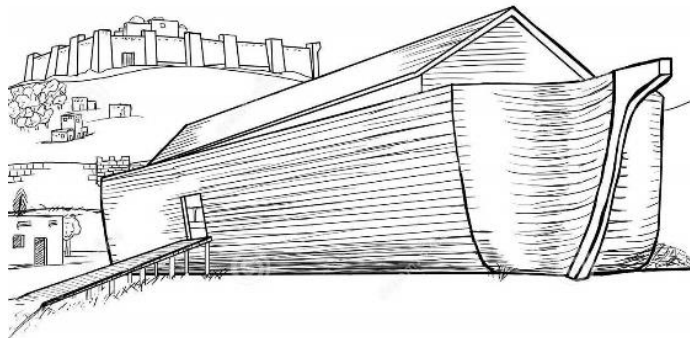


1. How do we know that the Great Flood was global?
2. Where did the ark land?

Landforms and oceans 14

Facts about Noah's ark

- The Ark was huge. It was as big as one and a half football fields.
- It was large enough to hold two of every kind of animal. This did not mean all the different species, but just one type of cat and one type of dog etc. These animals had all the genetic information to produce different types of cats, dogs etc. in the future. God would have sent baby animals to Noah, not full-grown ones. Baby dinosaurs and crocodiles would have been easier to handle.
- It was very stable. It was so well-built that modern ship builders say it would be almost impossible to tip over.
- It could handle waves of up to 60 metres.
- It was very stable.
- God watched over the Ark during the Flood and kept it safe because He wanted the people and animals to repopulate the earth.
- The Ark had an excellent design. It had 3 levels.
- It was made from gopher wood.
- It was waterproof. The inside and the outside were covered in pitch which is a kind of tar to seal the wood.



Write a description of Noah's Ark.

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The formation of mountains and oceans

During the Great Flood, entire continents rose up out of the floodwater while the ocean floor sank at the same time. This forced the floodwaters to rush off the continents into the oceans.

All this activity caused the sedimentary (soft) rocks to tilt, and fold, by squeezing of layers, or layers being pushed upwards.

This created mountains and valleys.

Just as there are valleys in the oceans, there are also underwater mountains. In the Atlantic Ocean, there is a range of undersea mountains 16,000 km. long. A few of the mountains rise above the surface to form islands.

Many people ask, "Where did all the water go after the Great Flood?"

The answer is in the mountains and valleys formed by the volcanic eruptions, earthquakes and Tsunamis. Mountains rose up and huge valleys were formed. The water ran into the huge valleys which are now our seas and oceans.

1. What was the surface of the earth like before the Great Flood?
2. What was is like after the Great Flood?

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The Ocean

Until modern times, no one knew what the bottom of the ocean was like. People thought it was like the deserts: flat and sandy. They believed the ocean floor was mostly saucer shaped and deepest in the middle.

But in the 1900s, oceanographers found that the sea has many deep valleys and canyons. The deepest of these canyons are called trenches and are amazingly deep.

How did the mountains and valleys get there? They were formed during the Great Flood, (Genesis 6-8). Genesis 7:11 tells us not only about the rain that fell but also about the underground waters which erupted from the earth.

The Bible mentions both the mountains and the valleys of the sea in the books of Jonah and Job:

Jonah 2:5-6 tells about Jonah who was thrown into the sea. He sank down to the very roots of the mountains in the sea.

In Job 38:16, one of the questions God asks Job is, "Have you walked in the valleys of the sea?"

How did the writers of these books of the Bible know about the mountains and valleys of the ocean thousands of years before scientists discovered them? God told them of course!

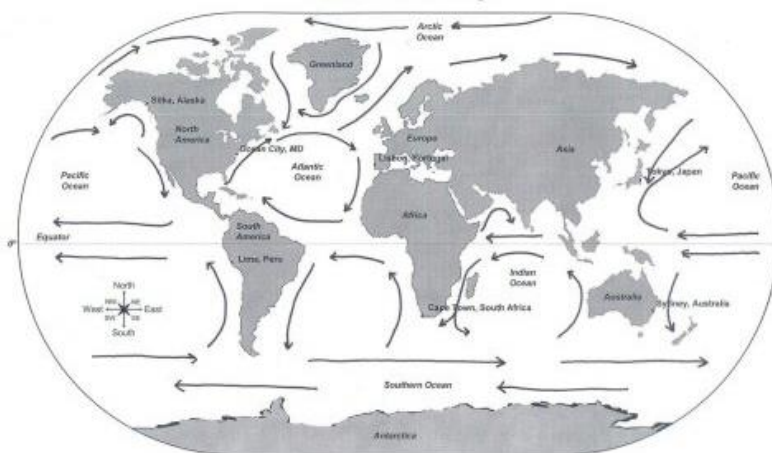
1. Write out the Bible verses that tell us that the ocean has mountains and valleys.
2. When did scientists find out?

Landforms and oceans 17

Ocean currents

The fact that the ocean has currents was discovered by a U.S. Navy officer, Matthew Maury, in the 1800s. Matthew was not only interested in oceans but also liked to read the Bible. One day he was reading Psalm 8 which tells us that God put human in charge of everything He made the birds in the sky, the fish in the sea, and everything that swims the ocean currents. (Some older versions of the Bible, like the one that Matthew was reading, call the currents “the paths of the sea”.)

It was because of this Psalm that Matthew got the idea that there could be paths in the sea. So, he set out to discover them. He discovered that the world’s oceans have many paths, or currents, which are like rivers flowing through the sea. There are warm currents and cold currents, fast currents and slow currents. In 1855 he wrote the first text book on oceanographic physics and became known as “the pathfinder of the seas” and “the father of navigation.” His discover and his books helped to make ocean travel much quicker and easier.



1. What are ocean currents?
2. How do ocean currents make sea travel easier?

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Glaciers

After the Great Flood, life did not get easier for Noah and his family. Because of the volcanic ash that was thrown up into the sky from the volcanoes, there were dramatic weather changes. Fortunately, in the Middle East where Noah landed, the weather changes were not as dramatic, but the North and the South were about to get much colder. This was called the Ice Age.

During the Ice Age, snow and ice covered three times more of the earth's land surface than it does today. Scientists know there was an Ice Age because they can see areas that were affected by huge moving sheets of ice called glaciers. A glacier leaves behind scratched rocks, mounds of broken rock called *moraines*, and out-of-place boulders. There is evidence that glaciers were present in places where there is no snow and ice today.

Glaciers are rivers that are frozen solid. Like normal rivers they move, but very slowly. The rocks that they pick up as they move scratches the bedrock, like giant sheets of sandpaper. The scratches look like grooves that run in one direction.

1. What caused the Ice Age?
2. What are glaciers?

