

God is a Protector Year 5

The history of shelter

God is our refuge and strength

For in the day of trouble He will keep me safe in His dwelling; He will hide me in the shelter of His tabernacle and set me high upon a rock. Psalm 27:5

A house is a shelter from wind and rain, from heat and cold. It provides protection from the elements. God is our shelter. He is our Heavenly Father who protects us against the storms of life. God's shelter is invisible. That is, the invisible shelter of His love and care.

Shelters can also provide protection from physical danger. The castle of the Middle Ages, was a refuge in times of attack. Forts and fortresses are also refuges. A refuge is a place where we can go when we are in trouble. God promises to be our refuge and strength. We can trust in God's amazing power and strength. God is stronger than any fortress. He can protect us from danger and evil. He provides us with weapons to fight evil. These weapons are found in the armour of God.

God is able to protect us because of His strength. He is not only great, strong and mighty, but also faithful in His care for us. The Psalms tell us that God is a rock. He is a refuge and our strength, and an ever-present help in the time of trouble. This picture of strength is linked with His omnipotence. He is Lord and King, the only true God, great and mighty and one in whom we can trust.

Buildings in the Bible

Tower of Babel (Genesis 11)

Noah's Ark (Genesis 6-8)

The tabernacle (Exodus 26 & 27)

The temple (1 Kings 6 & 2 Chron. 3 & 4)

The house on the rock (Matt 7:26)

Image of Christ the cornerstone (Ephesians 2:20)

Image of the body of Christ as living stones (1 Peter 2:5)

Key Questions

Why does a rock remind us of strength?

What does the Bible tell us about God's power and strength?

Which miracles in the Bible show God's strength?

There is evidence that some early people groups lived in caves. How would you use Biblical evidence to explain to someone that early cave dwellers were not ape-like beings but intelligent people like you and I?

Activities

- Research the history of shelter
- Make small bricks from various materials, e.g. mud or clay. Add reinforcements to some, e.g. stones, straw. Test the strength of the bricks by dropping them from waist height.
- Make drinking straw towers and bridges.

- Investigate the strength of fresh eggs by applying loads to different parts.
- Take a sheet of A4 paper and predict its possibilities to support a weight, unaided. Pleat the paper using 4-5 cm pleats. Make a column from the piece of paper and try to support a ruler. Test the column with other weights. Find out how much weight the column will actually support. Make a table showing results.
- Make a bridge from the pleated paper using two supports. Find out how much weight the paper will support when placed as such. Compare results with those of the single support.
- Take another piece of A4 paper and make a column by rolling. Compare the supporting ability of the column with the above.
- Use a strip of card to form a bridge between two pillars (or wooden blocks). Find out how to stop the card collapsing in the middle by - a) moving the pillars closer together, b) using wider card, c) using a stronger material. Draw conclusions.
- Experiment with building blocks to show the stability of different laying patterns similar to those used in bricklaying.
- Make the tallest structure you can using only - a packet of straws, a roll of sticky tape, scissors and newspapers.
- Observe structural features in famous buildings around the world e.g. Egyptian pyramids, leaning tower of Pisa, Eiffel Tower, The Beehive (Wellington N.Z.).
- Describe some of the structural developments of Greek and Roman times such as columns, arches, stone arch bridges (aqueducts).
- Investigate the strength of triangles and arches. Make a model aqueduct using scored cardboard for arches. Use plastic straws or cardboard strips to make triangular constructions.
- Compare bridges designed on suspension or compression principles e.g. Golden Gate Bridge USA (suspension) Roman stone arch bridges (compression).
- Explore the local environment comparing old and new buildings. Assess stability of buildings, taking into account building materials and methods.

Mathematics:

Research strength of shapes and prisms; measure heights of structures; estimate, measure, and record length, height, and distance, using standard units (i.e., centimetre, metre, kilometre);

Estimate, measure and record the mass of the load that the structures can support.

Values education Year 5

God is Protector

Faith and Trust

Faith is complete trust or confidence in someone or something. Trust is being certain that the 'someone' or the 'something' will not let you down.

Having faith and trust means:

- we trust those who have proven themselves trustworthy.
- we feel safe with people we can trust.

Christians put their trust in God who is trustworthy. They have faith that God is in control of their life and whatever happens, He is still looking after them.

Discussion and activities

Tell your partner about a time when you felt afraid.

Tell your partner about something you might be afraid to do in the future.

What do people worry about mostly?

Finish this sentence: "When I am afraid I can have faith because ..."

Bible passages

- Isaiah 41:13 "I the Lord hold your right hand. Do not be afraid. I am the one who helps you."
- Romans 8:28 All things work together for good, in the lives of those who love and trust God.
- Psalm 23 The Lord is my shepherd
- Hebrews 11:6 Without faith it is impossible to please God.
- Ephesians 6:16 Put on the shield of faith.
- Matthew 17:20 Faith as a grain of mustard seed.
- Matthew 21:21-22 If you have faith, you can say to this mountain, 'move' and it will move.

Practical Science 1

God is Protector

How strong is an egg shell?

<http://www.scienceweek.ie/assets/media/Resources/Primary%20Schools/2012%20activities/2012-Science-Week-how-strong-is-an-eggshell.pdf>

What happens if you drop an egg onto a hard surface?

That's right, the shell breaks. Is an eggshell always this fragile? Let's investigate.

What you need 4 raw eggs (same size) Pencil Glass Scissors Sheet of A4 paper Ruler Heavy books

What you do

1. Using the pencil, draw a line around the widest part of one of the eggs.
2. Crack the pointed part of the egg. Pour the contents into a glass. (You could later use these eggs to make a nice healthy omelette).
3. Carefully break off the pieces of the eggshell down to near the pencil line. Use a scissors to nip off the shell near the line. Try and keep the rim of the shell as even as possible.
4. Repeat steps 1 to 3 with the other 3 eggs.
5. Draw a rectangle on a sheet of paper (about 18 cm by 12 cm).
6. Place one of the egg shells on each corner of the rectangle, with the cut edges facing down, as shown.
7. Carefully place a heavy book on top of the eggshells as shown.

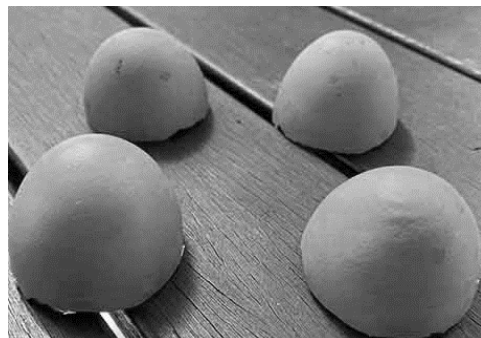
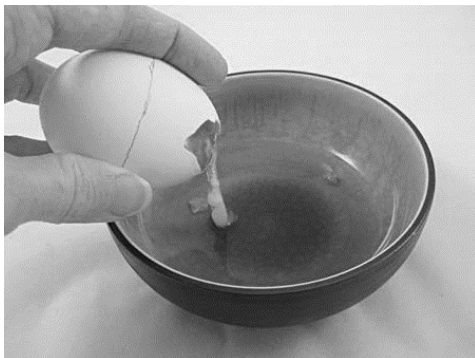
What happens?

The eggs do not crack.

Why?

The halved egg shells under the books are dome shaped. As you can see from the diagram below, a dome is like a number of small arches arranged in a circle.

An arch is strong because its shape evenly spreads the weight on top of it. The weight of the books acting downwards is balanced by the strength of the dome-shaped eggshells. The weight of the books is spread evenly along the curve of the eggshells as shown below.



Practical Science 2

Triangles and squares

What you need:

- Toothpicks or match sticks
- Lumps of blue tack or plasticine

Background information

The triangle is a strong shape and is used to support structures. Under a heavy load, a square distorts easily. If you put a brace diagonally across the square, you create two triangles and a much stronger shape. In fact, the triangle is the only shape that cannot be deformed without changing the length of one of its sides. Because it is not easily deformed, the triangle is an extremely popular building shape.

Questions

What shapes do you know?

Can you pick out any shapes in this room?

If you look at a bicycle (or a picture of one) can you pick out any shapes?

What shapes help the bicycle move? (Circles, wheels)

What shapes make the bicycle strong? (Triangles in the frame).

How would you make a corner stronger on a bench or a table?

(Ans: Add a strut across the corners to make a triangle.)

Activities

1) Squares and Cubes

(This takes 8 lumps of Blue tack and 12 toothpicks.)

Make a cube.

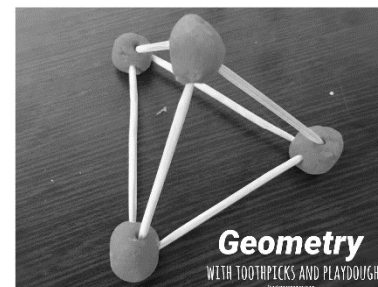
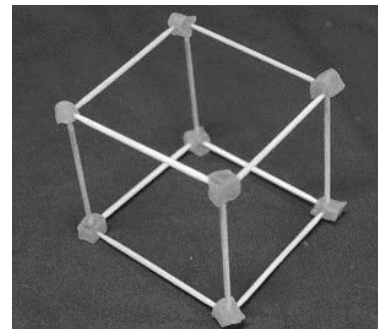
2) Triangles and Pyramids

Make a triangular-based

Now make a square-based pyramid. Which shape is the strongest?

3) Construction challenge:

When you make a structure that uses both triangles and squares you can make large structures. Try to make a structure using both.



Practical Science 3

Design a bridge

http://www.primaryscience.ie/media/pdfs/col/dps_maths_bridges_activity.pdf

Find a context where children have to think about crossing a river. This might be a story or a local river crossing. Find out what children think and know about bridges. They may mention tunnels as well as a means of getting across.

Have a display of pictures of bridges.

Visit a local bridge.

Do this introductory work on the day prior to doing the activity?

Questions

What is a bridge?

Where would you find bridges?

What are bridges made of?

What makes a good bridge?

What types of bridges are there? Can you name any?

(Bridge designs include arch, suspension etc.)

Activity 1

Place two piles of books the same distance apart on each table.

Make different kinds of bridges between the books and test which ones are strongest.

e.g. make a simple bridge using 1 page of A4 paper. Test its strength by adding coins or other masses.

Activity 2

Design a Bridge

Explore how to make a paper bridge stronger

Using the blocks or books, paper and coins, design a bridge that will take the heaviest weight.

Try the following and record the results:

- 1) Make a bridge from one piece of paper and test its strength by adding coins or other masses until the bridge collapses.
- 2) Use two pieces of paper and test again.
- 3) Use one piece of paper and fold up sides, i.e. a walled bridge
- 4) Make an arch (using two pieces of paper).
- 5) Make a corrugated bridge, (folded like a paper fan.)
- 6) Make a bridge out of a different material.

Art Year 5

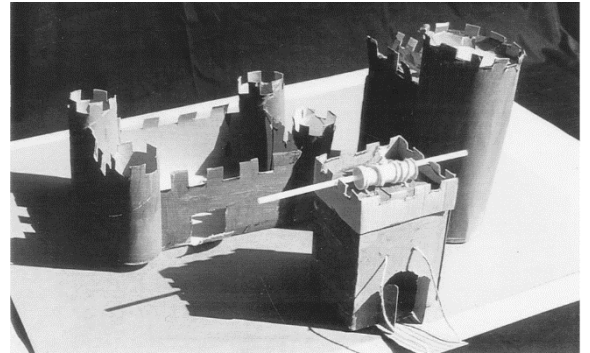
God is Protector

Buildings of the world

Biblical wall display: The name of the Lord is a strong tower. The righteous will run into it and be safe.
Proverbs 18:10

Construction

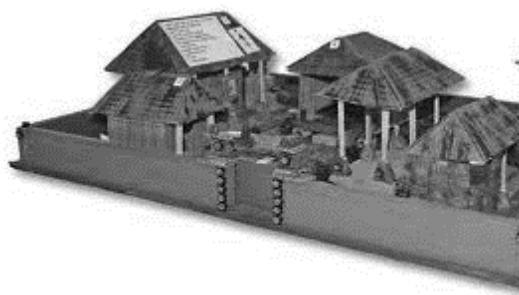
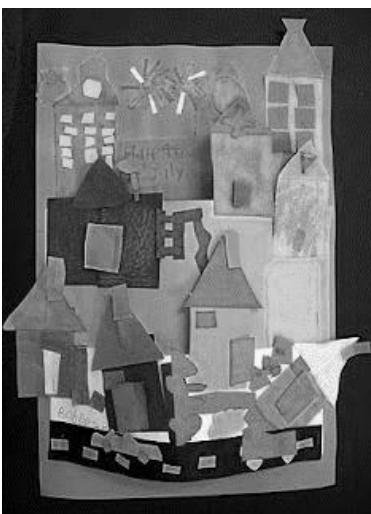
Design and build a model of structure that is strong and stable. Explain why your model is a strong structure.



Drawing and painting

Buildings past and present: Make a timeline in picture form of the history of buildings in your country.

Buildings rural and urban: draw the different buildings you might see in a village. Compare to buildings in a city.



Thinking Skills Protector Yr 5

<p style="text-align: center;">Structure for strength 1</p> <p>Draw a boat. Now redesign it by using the following steps: B - igger I – instead of N - onsense G – et rid of O – ther uses</p>	<p style="text-align: center;">Structures for strength 2</p> <p>Construct a bridge using:</p> <ul style="list-style-type: none"> •a book •10 straws •sticky tape
<p style="text-align: center;">Structures for strength 3</p> <p>Give 3 possible explanations for:</p> <p style="text-align: center;">a collapsed bridge</p>	<p style="text-align: center;">Structures for strength 4</p> <p>Think of 5 ways that God can give us ‘strength’.</p>
<p style="text-align: center;">Structures for strength 5</p> <p>Make a new product using:</p> <ul style="list-style-type: none"> •an egg •a pack of cards •a cardboard cylinder 	<p style="text-align: center;">Structures for strength 6</p> <p>Design a structure that will not collapse in the event of an earthquake. Draw it if possible.</p> <p>Give reason for the design of your structure and the choice of materials.</p>

Thinking Skills Protector Yr 5

<p>Structure for strength 7</p> <p>List 10 materials that are not used in the construction of a house.</p>	<p>Structures for strength 8</p> <p>What if there were no multi-story buildings allowed to be built.</p> <p>Write down 3 possible consequences.</p>
<p>Structures for strength 9</p> <p>Consider 5 alternatives to:</p> <p>“crossing rivers using bridges”.</p>	<p>Structures for strength 10</p> <p>The answer is:</p> <p>“The Eiffel Tower”</p> <p>Think of 5 questions.</p>
<p>Structures for strength 11</p> <p>Brainstorm 5 ways that</p> <p>“The Leaning Tower of Pisa”</p> <p>could be made to stand upright.</p>	<p>Structures for strength 12</p> <p>List 3 disadvantages and 3 improvements to:</p> <p>a brick house</p>

Brother Andrew

Biography

Many people today show bravery in serving God. Some people face dangers as they take His word to places where it is forbidden. They must trust God to protect them. Brother Andrew is a person who has served in such places.

Andrew, son of a blacksmith, grew up in a typical Dutch town. Living in Holland, a free country, Andrew had great concern for people in countries where the gospel could not be preached. Some of these countries were Russia, Hungary, Albania and China. In those days, the Socialist government did not allow religious freedom.

When Andrew grew older he conducted missions to these countries. With his car packed with Bibles, concealed in all sorts of secret compartments, he would drive his car through border crossings. As he did, he prayed that the Lord would 'close the eyes' of the border guards. God did it time and time again.

Here is a story about one of Andrew's experiences. He had just made it through the Hungarian border without being caught. God had again made seeing eyes blind. He drove on through the beautiful country side which followed the River Danube. He started to feel hungry so decided to stop for some lunch. He drove down a sandy lane and stopped at a little clearing at the water's edge. In order to get to the camp stove, Andrew had to move several boxes of gospel literature that the guards had just overlooked. No sooner had he opened the can of peas and carrots when he heard the roar of a speed boat approaching. The boat was heading towards Andrew at full throttle. In the bow, stood a soldier with a drawn machine-gun. At the last possible instant the boat swerved and coasted to a neat landing at the river's edge. Andrew now saw that there were two other soldiers in the boat. The man in the front leapt ashore followed by another one. "Lord," Andrew prayed, "help me not to be afraid."

The first soldier kept the machine-gun on Andrew while the other ran to the car. Andrew kept stirring the peas and carrots as he heard the car door open. "Well," said Andrew, "it is certainly nice to have you drop in this way. Would you care to join me?"

Andrew reached into his picnic box and drew out two extra plates. He motioned to the soldier to come and sit down. The soldier stared stonily and shook his head, as if to say, "I'm not going to be bribed." Andrew could hear the other soldier poking around. Any moment now he was going to ask about those boxes.

"Well," said Andrew, "if you don't mind, I'm going to go ahead and eat while the food is hot."

Andrew bowed his head and prayed. Then an amazing thing happened. While he prayed there was no sound from the soldier inspecting his car. Just as soon as he had finished praying, the door slammed. Andrew heard the sound of footsteps coming rapidly towards him. He picked up his fork and started to eat. For a moment both soldiers stood over him. Then abruptly they whirled around. Without looking behind them, they ran down to their boat, jumped in, and roared off in a spray of white. That was the last he saw of them.

Brother Andrew Activities

1. Name some of the countries that Andrew went to.
2. Why did he want to go to these countries in particular?
3. What miracles did God do for Andrew, to enable him to get Bibles into these countries?
4. Why would you say that Andrew showed great courage?
5. What do you think could have happened to Andrew if he had been caught?
6. Write about a time when God has protected you, or someone close to you.

Irena Sendler

(1910 – 2008) Poland

When World War 2 broke out in 1939, Irena Sendler was a 29-year-old social worker, employed by the Welfare Department of Warsaw, Poland. After the German occupation, the department continued to take care of the great number of poor people in the city.

Irena Sendler took advantage of her job in order to help the Jews. However, this became practically impossible once the ghetto was sealed off in November 1940. About 400,000 people had been driven into this small area of housing. The poor hygienic conditions in the crowded ghetto, the lack of food and medical supplies resulted in epidemics such as typhoid, and the high death rates were high.

Irena Sendler worked out a way to get into the ghetto and help the dying Jews. She managed to obtain a permit from the council that enabled her to enter the ghetto to inspect the sanitary conditions. Once inside the ghetto, she made contact with a network of people who wanted to help the Jews. She helped smuggle Jews out of the ghetto and helped set up hiding places for them.

Knowing that the ghetto was soon to be destroyed, and the Jewish residents to be sent to concentration camps, (or death camps), she convinced Jewish parents to give up their children so that the children could be saved. Irena found Polish Christian families who were willing to adopt Jewish children. These families would take the Jewish children in as their own children, until after the war was over. If their parents were still living at the end of the war, they would be returned to their parents. In order to make sure of the location of each child, Irena secretly kept each child's name and location on pieces of paper which she placed inside glass jars. She then hid the jars in the ground so that the Nazis would not discover their identity.

Once the ghetto was destroyed, Irena turned her attention to work as a nurse. She used her job as a nurse to rescue Jewish children. Using an ambulance, a child could be taken out hidden under the stretcher. If a child could pretend to be sick or was actually very ill, they could be legally taken away using the ambulance.

Sometimes a trolley was used to carry out children hiding in a sack, a suitcase or something similar. Some children were taken out through secret underground passages.

For each child she rescued, she made false identity papers for them, and gave them a new Polish name. This meant that the children had to practice their name and not use their Jewish name. She dressed the children in smart clothes, unlike the poor clothes they were wearing in the ghetto, so that they would look like Polish children and not Jewish children.

In 1943 her activities were discovered and she was arrested, along with her friends who were helping her. Anyone found assisting Jews would normally be shot. Irena's friends were shot, but the Nazis did not want to kill Irene before they found out the information

on where the Jewish children were hiding. Irena would not give them any information, even though she was tortured, her legs and feet bashed so that she could not walk.

Irena had a close Jewish friend, who was able to get her out of prison by bribing one of the guards. She was able to escape and stay safe until the end of the war, when some children could be reunited with their parents. However, sadly, many parents were killed in the concentration camps. Altogether Irena was able to save 2,500 children.

On October 19, 1965, Yad Vashem, a world Holocaust remembrance centre in Israel, recognized Irena Sendler as *Righteous Among the Nations*. The tree planted in her honor stands at the entrance to the Avenue of the *Righteous Among the Nations*.

Trouble for the Jews throughout history

Throughout history, the Jews have been under attack. Satan knows that God has a special plan for the Jews in the future history of the world. Satan does all he can to stop God's plan, and he will do so until one day he will be thrown into the lake of fire and destroyed.

Throughout history Satan has worked through various people, to try to destroy the Jews. Hitler has so far been the most evil of these. He murdered around 6 million Jews in an event in history called the Holocaust.

Although the Jews have suffered much, they have not been destroyed, and after World War 2 those who survived the Holocaust returned to the Middle East to reclaim their own land, Israel. God's plans cannot be destroyed by Satan, God, in His wisdom, has used the willing hearts of Christian people, such as Irena Sendler, to fight for the Jews. God used Christians to save many Jews during the Second World War.

The historical story of Esther in the Bible is another example in history where God stepped in to save His people. Jews still remember this event today by holding a special thanksgiving feast each year called Purim.

In the 4th Century BC, the Jews were ruled by Persia, under King Ahasuerus. Haman was the King's prime minister at the time. It was his evil idea to kill all the Jews, and he convinced the King that this should happen. However, it was Esther who God used to save the Jews. The king discovered that Haman had evil motives and the plan did not go ahead. Instead Haman was hanged.

During the feast of Purim, special triangular pastries filled with honey are eaten to celebrate the Jew's victory. Children dress up as characters from the story and act it out.

History of shelter 1

The First Homes

Student activities

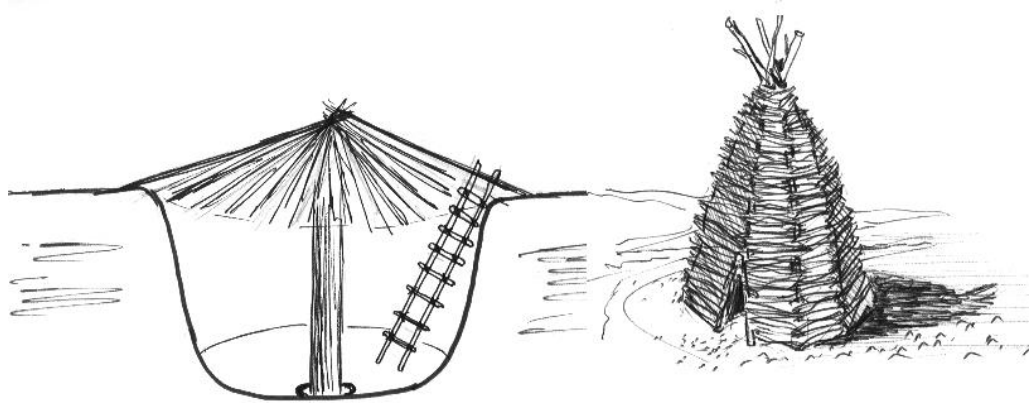
Most people, who do not believe the Bible, imagine that the first people were a kind of half man, half ape, living in caves and having little intelligence. However, Christians know that there were never such beings as ape-men, and that people were created with the same intelligence that people have today.

It is true that some people did live in caves because we see their paintings on the walls, but these people as intelligent as people today. Early people were also able to build structures out of the materials they found around them. Noah, who lived on earth 1500 years after the creation, was capable of building a huge and wonderful boat, capable of staying afloat for 40 days. The people of Babel, who we read about in Genesis 11, were capable of building an enormous tower.

Archaeologists are people who look for things from the past. Some have found remains of early types of dwellings. They have found evidence that people in early times built pit dwellings. To make pit dwellings, holes were dug in the ground and covered with logs, placed horizontally over the hole. Then earth was heaped on top.

Remains of other types of dwellings have also been found. It seems that in early times, people used materials like wooden posts, reeds, leaves, mud and animal skins.

Draw and label 3 types of early homes.



History of Shelter 2

Desert homes

Desert homes must perform two functions. They shield the interior from intense daily heat, and must also store that heat for use during the cool nights. The best material for this is heavy clay or mud, moulded and baked into bricks. Mud bricks slowly absorb the sun's rays during the day, preventing the heat from penetrating the interior of the home. Then, during the cold night, the warm bricks radiate their stored heat and keep the interior warm. There is evidence that mud bricks were used in hot desert areas all around the world.

Another type of desert home is the tent. Tents were used by nomadic people. These are people who move around from place to place. A tent can be taken with you wherever you go. The desert tents, like those of the Arabs, usually have broad canopies over the doorways, to lessen the effects of the sun and wind. Tents were originally made from animal hides which were sewn together. Tents were used by many people around the world, including the American Indians.

1. Why are mud bricks such an effective form of shelter in desert regions?
2. Why were tents a suitable form of shelter for nomadic people?
3. Draw a tent belonging to an Arab from a nomadic tribe. Label your drawing to show the main parts of the tent and the materials used.
4. Compare a camping tent of today with traditional tents. What do they have in common?

History of Shelter 3

Eskimo homes

Eskimos live in the arctic, in the far north of the world.

The arctic climate is harsher than any climate in the world. The only building material available to traditional Eskimos was the snow itself. The Eskimos, using a semi-circular snow knife, cut long flat blocks of snow and arranged them in an ascending spiral, that became smaller and smaller at the top, forming a dome. The igloo was built from the inside. Cutting blocks from around his feet, the Eskimo would lower the floor level as the dome rose above him. When the igloo was finished, more than half was below the surface. A small tunnel was connected to the igloo. This is where the sled-dogs sheltered. A small hole was left at the top of the igloo to provide ventilation, and to allow smoke to escape.

The inside of the igloo was warm, keeping out the outside cold and wind. Seal oil-lamps provided light and warmth. Blocks of ice were cut for furniture, and covered with animal skins. The temperature of the inside of the igloo was much higher than the temperature outside. The dome shape was excellent for the arctic conditions as the howling winds only swirled around the smooth shape and did no damage.

1. Draw a picture of an igloo. Include the details you have read about in the text.
2. How did the Eskimo get the floor level to be lower than the ground outside?
3. What was the small tunnel for?
4. Why was there a small hole at the top?
5. What was the igloo like inside?

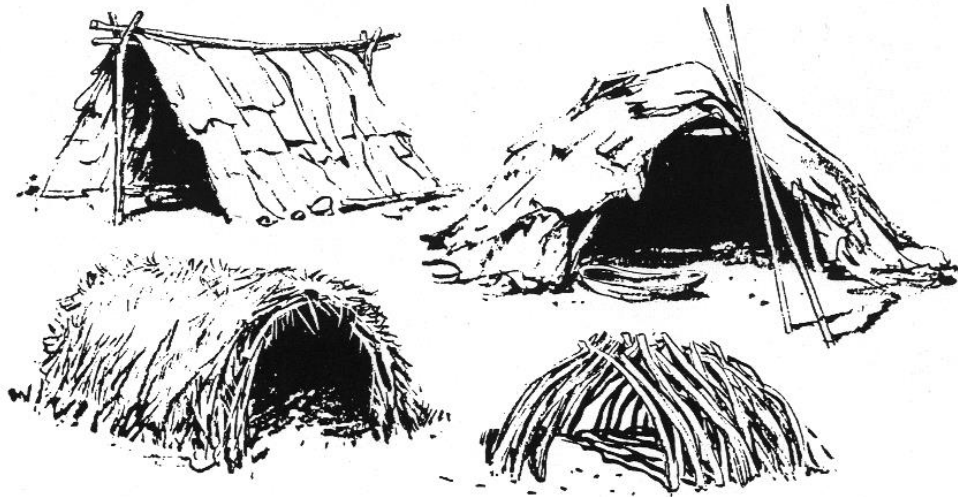


History of Shelter 4

Early homes of Australian Aboriginal people

The Australian Aboriginal people moved around from place to place. They understood the land, and never mistreated it. They would never take all the food plants from one place, but left some so there were enough seeds to produce more plants. Their homes were easily built from the materials around them, like bark, grass and sticks. When they moved on, they simply built new homes. Australian Aboriginal people now live in permanent homes made of modern building materials.

Draw and write a description of some of the early Australian Aboriginal homes.



History of Shelter 5

Traditional Fijian homes

Bure is the Fijian word for a wood-and-straw hut.

The traditional Fijian people built bures out of the materials around them. The materials were either stacked together, tied together by rope, or a both. Bures were for the men.

The other type of house was the vale. This was the family house. Both of these buildings were dark and smoky inside, often with no windows and usually only one low door. Vales had hearth pits where the women cooked. The packed earth floor was covered with grass or fern leaves and then carpeted with pandanus leaf or coconut leaf mats.

1. Make a list of 5 materials that you might use when building a bure.
2. There were no nails or screws, so how did the bures hold together?
3. Who used the bures?
4. What was the family home called?
5. What is a hearth pit?
6. Describe the floor of the vale.

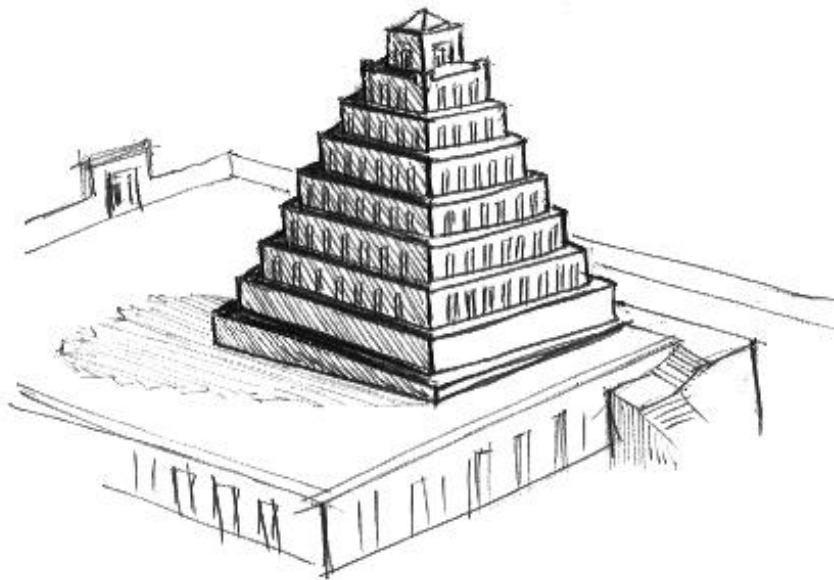


History of Shelter 6

Famous buildings around the world

The Tower of Babel (Babylon, now Iraq)

You can read about this tower in Genesis 11. It was built by the descendants of Noah, who thought they were so great that they could reach heaven. God saw their proud hearts and put a stop to the building by confusing their languages. Because they suddenly spoke different languages, they couldn't communicate with one another to finish the building project. It is believed that the tower was a 90 metre high stepped pyramid called a ziggurat.



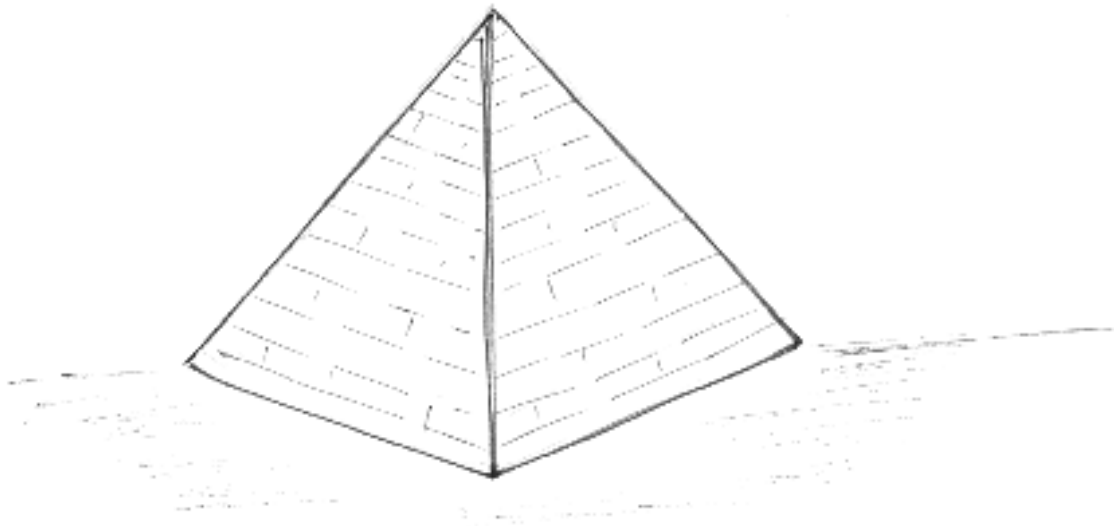
1. Draw the Tower of Babel.
2. Why was the Tower of Babel built?
3. Why wasn't it finished?

History of Shelter 7

Famous buildings around the world

The Pyramid of Giza (Egypt)

Like the people who built the tower of Babel, the Egyptians also wanted to build tall structures to get closer to heaven. The Egyptians worshiped false gods. They buried the pharaohs in the pyramids, along with their treasures, and food for their next life. Without steel or concrete, the only way of building high in ancient times was to pile stone blocks on top of one another. Slaves were used to haul the huge stone blocks. God's people, the Israelites were slaves to the Egyptian pharaoh at the time, but God chose Moses to set them free. The Great Pyramid of Giza was completed about 2550 BC and was 146 metres high.



1. Draw the pyramid of Giza
2. Why did the Egyptians bury the pharaohs with food and treasure?

History of Shelter 8

Famous buildings around the world

The Colosseum (Rome, Italy)

About 2,000 years ago, the city of Rome was at the heart of a vast empire. The Romans built huge arenas called amphitheatres. Men called gladiators fought each other or wild animals, while people watched. Sometimes Christians were put in the arena with wild animals. The Colosseum, in Rome, was the biggest amphitheatre they built. It had room for about 50,000 people. The Romans sometimes flooded the Colosseum and watched ships fighting each other in sea battles.

The Colosseum had three layers of arches and the arena was oval shaped. There were about 80 entrances, and tickets had the right entrance number stamped on them. Slaves and women sat on wooden benches at the back. The other seats were marble.



1. Draw the Colosseum.
2. What was it used for?
3. What did the Roman government do to Christians?

History of Shelter 9

Famous buildings around the world

The leaning tower of Pisa (Italy)

The 55 metre high leaning tower of Pisa in Italy was built between 1174 and 1350. Unfortunately, it was built on soft ground without proper foundations. As a result, the soil has settled unevenly, making the tower lean about 5 metres towards the ground.



1. Draw the leaning tower of Pisa.
2. Why is it leaning?

History of Shelter 10

Famous buildings around the world

The Eiffel Tower (Paris, France)

Alexandre Gustave Eiffel, a French engineer, was one of the first to realise the great possibilities that iron had in building. Using iron was the first step to building skyscrapers. Eiffel made the highest iron building ever, for the Paris exhibition in 1889. It was 300 metres tall.

1. Draw the Eiffel Tower
2. Why was the Eiffel tower built?
3. What was it made from?
4. What did people learn from the building of the Eiffel Tower?



History of Shelter 11

Some important building structures

Engineers are people who work out the strength of a building. They must understand the strength of the materials and the forces that will make a building stay upright. Bridges, towers, domes, arches are some of the structures built by engineers.

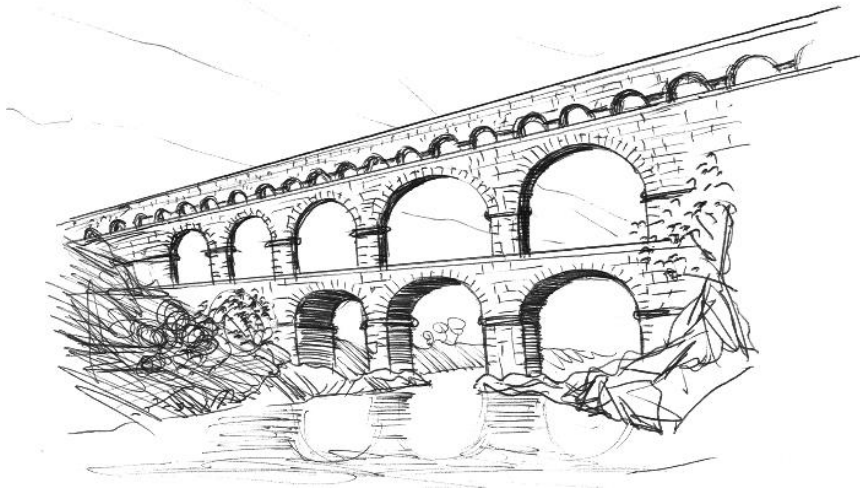
Arches

The Romans were the first to use the arch. They put an arch shaped wooden frame on top of two stone pillars. Stones were tightly packed together around the frame. Sometimes a wedge-shaped stone at the top held the other stones in place. This was called a **keystone**.

The arch is a very strong shape. It can support a heavier weight than a post and beam.

The Romans also used arches for strength in the building of aqueducts. An aqueduct is a canal built on top of a bridge made of arches. The series of arches support the canal of water above.

1. Why do builders use arches?
2. Draw pictures of buildings that have arches.



History of Shelter 12

Some important building structures

Roof frames

Making a strong waterproof roof can be the most difficult part of building a house. Flat roofs often leak. A sloping roof works better because the water runs off, but the roof must be strong enough to support the weight and stand up to high winds.

Triangles

If we look around us, we will see that many structures are triangular in design. Unlike the square frame, the triangular frame is rigid and will not change its shape.

Domes

It was the Romans who learned to make domes. They made a frame from wood and poured concrete over the wooden moulds. When the mixture dried, the framework was taken down.

The top of the dome was made of a slightly different mixture to make it lighter. At the top of the dome was a window called the eye. The dome was very strong.

1. Draw and describe the best kind of roof to keep the rain off.
2. Draw a building with a dome shaped roof.
3. What are some dome-shaped things that we use?

