

# Touch and hearing: Teacher's topic guide

## God is Creator Year 3

### Finding out through the sense of touch

#### **Spiritual Awareness: Using the senses to discern the truth**

We use our senses to find out about the world around us. We know how something feels by using our sense of touch: rough, smooth, wet, dry. Our sense of touch helps us find out the truth about the world that God created.

How can we find out whether an idea is true? God helps us to do that when we ask Him to show us. God has given us the Holy Spirit to show us what is true and what is false. As we listen to God's voice and get to know God's word, we will know what is true. Jesus said, "I am the Way, the Truth and the Life."

#### **Values: Our response to 'God is Creator'**

- Believe God's word: the creation explained in explained in Genesis 1 and 2
- Faith in the word of God being the truth
- Respect for truth
- Trust in the Holy Spirit to lead and guide us into all truth.

#### **Outcomes: Students will**

- explain how our sense of touch helps us to find out about things around us
- explain how we find out whether ideas in the world around us are true or false
- be able to identify what parts of the body are used for our sense of touch
- be able to predict some of the things they would be able to feel if they were put in a situation
- discover objects based only on the sense of touch

#### **Biblical stories and passages**

Genesis 1 and 2 The creation

*References concerning truth:*

Matthew 7:13-14 The broad and narrow way

Matthew 16:13-17 Jesus asks, "Who am I?"

John 10:1-8 The Good Shepherd. The sheep recognize His voice.

Matthew 7:15-21 Wolves in sheep's clothing

John 14: 6 Jesus said, "I am, the way the truth and the life."

John 16:13 When the Holy Spirit comes He will guide you into all truth.

Acts 17:16-34 The unknown god

Psalms 115:4-7 Those who worship idols: "Their gods are made of silver and gold formed by human hands. They have mouths but cannot speak, and eyes but cannot see. They have ears but cannot hear, and noses but cannot smell. They have hands but cannot feel, and feet but cannot walk."

Luke 8: 40-56 The woman who touched the hem of Jesus garment.

**Key question:**

How do we find out about things?

**Activities**

- Explain that the things that we touch have many different textures: rough, smooth, soft, hard. Explain that we not only use our hands for our sense of touch, but if we have our shoes off, we can also use our feet.
- Show the students a picture of a beach scene, or ask them to imagine it. Ask the students to make a list of the things that they think they would be able to touch and feel if they were in this picture. Encourage the students to share their ideas.
- Put some familiar items inside socks or brown bags, and have the children feel them and guess what they might be. Explain that in this activity they will use their sense of touch to try to find out what is in the socks/bags. Remind students that they are NOT to look in the bags.
- Discuss what items the students thought were in the bags and show them what it really was.
- Explain: "We can feel different sensations on our skin. We can sense touch, pressure and temperature. We have skin all over our body. Our hands are very sensitive to touch." Make a list of the way things feel using our hands, e.g. hot, cold, rough, smooth.
- Ask: If you were not able to see with your eyes, would your sense of touch be helpful, and why?
- Do you think it's possible to drop a marble (or a coin) into a paper cup without looking? Try it. Put an item in a paper cup without looking. How were you able to do this?
- Compare your sense of touch with your other senses. Which do you think is the most important and helpful to you? Why? Equally helpful?
- Do you think we could do as well without one or more of our senses? Talk about it and try different tests. Some people are not able to see, or hear, or smell, and scientists have found that those people are able to develop another sense very strongly, to help them understand our world.
- Obtain a Braille alphabet sheet, or simulate one with dots of dried glue. Explain what it is used for, and have the children feel the letters with eyes open and eyes closed.
- Have an outdoor treasure hunt. Ask the children to find something rough, something smooth, something prickly and something wet. Make up your own criteria according to your environment.
- Have the children make their own tactile board. Make available a piece of heavy paper or card, and a variety of items with strong sensory qualities. E.g. sponge, foil, sandpaper, bark chips, coin etc. Have the children glue some items to the board, and then when dry, close eyes and guess what the texture is by feeling it with hands
- Compare sensations by placing an item on an arm, or cheek, or foot. Do you think the sensation is stronger by touching with your hand, or with your cheek etc.?
- Do the same thing but have the child close eyes and answer.
- Child closes eyes. You touch a child on arm with finger. Have the child try to touch the exact spot where you touched.

**Beacon Media student research cards:** Touch

# Sound and hearing

## God is Creator / Protector

### Spiritual Awareness:

God has given us our five senses as a means of protection. We hear sounds that warn of danger, when we are crossing the road or when a big storm is coming. God has also given us special ears to hear when we are being led to do something that God would not like. These special ears are not really ears at all but our thoughts. The voice we hear with the special ears is our conscience. It tells us right from wrong.

### Values: Our response to 'God is Creator and Protector'

- appreciation for the created world and the sense of hearing
- **trust** and **faith** in God to be with us always, including in times of trouble
- **security** and **confidence** in God as our protector
- **courage**: we have peace, and are not afraid because God is with us

### Outcomes: Students will

- explain the nature and properties of sound waves
- explain how sound waves are made
- test and explain the mediums through which sound travels
- explain how sound waves are received by the ear
- understand the different ways in which musical instruments produce sound
- make predictions
- observe reactions to sound
- classify types of frequencies of sound
- measure distances over which sounds can be heard
  - listen to different types of sounds and music

### Bible stories and passages

Mark 4:9 – He who has ears to hear, let him hear

Luke 10:38 - Mary and Martha: Mary listened to Jesus.

1 Samuel 3 - The boy Samuel hears God's voice.

Matthew 13:10-16 - The hidden meaning of the parables. We need to listen with 'special ears'.

Ephesians 6: 10-18 The armour of God for protection

### Key Questions

What is a good listener?

How do we hear?

What kinds of sounds do we hear?

How does hearing help to keep us safe?

What special help is available for people who cannot hear?

### Activities

- Identify sounds in the immediate environment.
- Identify sounds in the home.
- Go for a walk and identify sounds.
- Record sounds.
- Play 'Who am I?' – one child has eyes closed and tries to guess the sound of voices of other children.

- Classify sounds - loud, soft, harsh, musical, banging, tapping, whirring, clattering, buzzing, vibrating
- Make sounds using body parts.
- Make musical instruments from rubber bands (plucked), balloons (escaping air), rulers & containers (drum), jars filled with different levels of water (strike with pen), combs and tissue paper (blow), cardboard cylinders (blow).
- Classify instruments of the orchestra according to the way they make sounds, i.e. pluck, blow, bow etc.
- Listen to sounds of varying frequencies, (high/low), and measure the distance from which they may be heard.
- Experiment to see whether sound can travel through certain materials.
- Make 'telephones' from tin cans and string.
- explain the nature and properties of sound waves
- explain how sound waves are made
- Draw a diagram of the ear and the passage of sound waves.
- Read the biography of Helen Keller (Supplied in this folder)
- Find out how the hearing impaired can be assisted by scientific innovations, e.g. hearing aids

### **Learning Connections**

**Mathematics:** measurement – how far can sound travel? Use the tin can telephone and measure how long the string needs to be for hearing sound travel. Study relationship between mathematics and the notes of musical scales; historical development of our number system, computer codes, binary number system, calculators and formulae to describe laws.

**History:** the history of musical instruments and communications such as the telegraph, telephone, fax machine, computer

**Social studies:** assistance to the hearing impaired; sound pollution; comparison of noise/sound in city and rural areas; communication with those who speak another language

**Phys. Ed.:** listening to instructions in playing games

**Thinking skills:** Invent a new musical instrument

**Beacon Media student research cards:** Sound and hearing

**Thinking skills:** Five senses

**Biography:** Helen Keller

# Year 3 Values education

## God is Creator

### Thankfulness for who I am

For my life, my family and that I have life.

Thankfulness to God for creating me as I am.

God loves me just the way I am. He created me in a very special way. I am special to Him.

### Thankfulness for who I am...

- knowing that I am special to God
- feeling sure that I am a very valuable person
- feeling good about my strengths, but not boasting about them
- knowing that I am not good at some things, and accepting it
- feeling happy about the way I am
- knowing that God loves me just the way I am
- being thankful to God for the way He created me

### Activities

1. Design your own personal shield that shows the things you are good at. Draw symbols for things like music, cooking, drawing, or whatever you are good at.
2. Did you know that no one has the same fingerprint as you? You are special. Here's an art activity. Make some stamped fingerprint designs. Make the finger prints (or thumb prints or hand prints into animals. Use a pen to add legs, beak, tail or whatever you need to make your animal.

## Practical Science Year 3

### God is Creator: Sound

#### Bottle flute

<http://www.kidspot.com.au/kids-activities-and-games/Science-experiments+10/Bottle-Flute+11060.htm?>

Making music does not have to be a terribly noisy experience. Making music with these glass bottles can actually be quite pleasant. Give it a go and see if you can make a tune to impress.

##### What you need:

- 2 (or more) glass bottles
- water

##### What to do:

Fill the glass bottles with different amounts of water, without filling any to the top.

Blow gently across the top of the bottle so that you can hear a note.

Now blow gently across all of the bottles. They should all make different notes. Why? Because blowing air inside the bottle makes the water vibrate, creating the note.

#### Use a Balloon to Amplify Sound

<http://www.sciencekids.co.nz/experiments/balloonspeakers.html>

Small sounds can still make a big noise when you use a good sound conductor. Experiment with a balloon, compressed air and your own ears to find out how it works and the science behind it.

##### What you'll need:

A balloon

##### Instructions:

1. Blow up the balloon.
2. Hold the balloon close to your ear while you tap lightly on the other side.

##### What's happening?

Despite you only tapping lightly on the balloon your ears can hear the noise loudly. When you blew up the balloon you forced the air molecules inside the balloon closer to each other. Because the air molecules inside the balloon are closer together, they become a better conductor of sound waves than the ordinary air around you.

## Practical Science: Sound

### Making Music with Water

<http://www.sciencekids.co.nz/experiments/makemusic.html>

Have you ever tried making music with glasses or bottles filled with water? I bet your favourite band hasn't. Experiment with your own special sounds by turning glasses of water into instruments, make some cool music and find out how it works.

What you'll need:

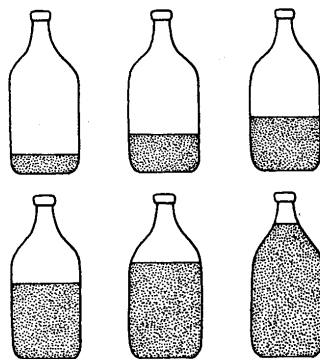
- 5 or more drinking glasses or glass bottles
- Water
- Wooden stick such as a pencil

#### Instructions:

1. Line the glasses up next to each other and fill them with different amounts of water. The first should have just a little water while the last should almost full, the ones in between should have slightly more than the last.
2. Hit the glass with the least amount of water and observe the sound, then hit the glass with the most water, which makes the higher sound?
3. Hit the other glasses and see what noise they make, see if you can get a tune going by hitting the glasses in a certain order.

#### What's happening?

Each of the glasses will have a different tone when hit with the pencil, the glass with the most water will have the lowest tone while the glass with the least water will have the highest. Small vibrations are made when you hit the glass, this creates sound waves which travel through the water. More water means slower vibrations and a deeper tone.



## Practical Science: Sense of touch

### Describe how things feel

Make a collection of things that feel different when we touch them:

Examples:

Sticks  
 Stones  
 Cloth  
 Ice  
 Cotton wool  
 Plastic  
 Metal  
 Sandpaper

Find words to describe each of these.

Make a classification table.

Make this into a bar graph.

hair	pineapple					
face	sandpaper	mango		metal	silk	finger paint
cotton	stick	stone	face	Ice	plastic	Jelly

**Soft      rough      smooth      warm      cold      slippery      slimy**

### Mystery surfaces

Make your own touch surfaces by coating pieces of cardboard with glue.

Then spread on things to give a texture, such as popcorn, sugar, flour, seeds, sand.

Put each card in a paper bag.

Take turns to pull a card out of a bag, eyes closed.

### Mystery fabrics

Make cards as for "Mystery surfaces".

Glue on to the cards different types of fabrics such as silk, tee-shirt material, scratch bag material, wool, fur



## **Practical Science: sense of touch**

### **Warm or cold?**

#### **You will need:**

Three jars of water: one icy cold; one at room temperature and one warm

#### **What to do:**

Dip one finger into the cold jar and one finger on the other hand into the warm jar for a minute.

Slowly, your brain will grow used to the two different temperatures.

Now move both fingers into the jar at room temperature and notice how it feels.

Although you know both fingers are in cool water, your brain doesn't agree.

#### **Why is this so?**

There are millions of nerve endings in your skin which are sensitive to heat, cold, pain, light and heavy pressure. Certain parts of your body, like your hands, are crowded with nerve endings and much more sensitive than other parts. The nerve endings send messages to your brain. If one message is received by the brain for long enough, your brain gets used to it and doesn't immediately recognize any changes.

## Practical Science: Sound and hearing

### Make a drum

#### What you will need:

- A balloon
- Scissors
- A strong elastic band
- A can with both ends removed

#### What to do:

Blow up the balloon and leave it for at least 2 hours so that it can stretch. Carefully cut the end off the balloon. Try not to burst it. Let the air out slowly. Cut a large circle out of the balloon with scissors, Stretch the circle over the tin can and secure it with an elastic band.

The balloon is like a skin on a drum. It vibrates as you hit it with your fingers. This makes the sound.

1. What other materials are used to make different types of drums?
2. Why does the skin need to be stretched?
3. The vibrations are travelling through the \_\_\_\_\_ to our ears.



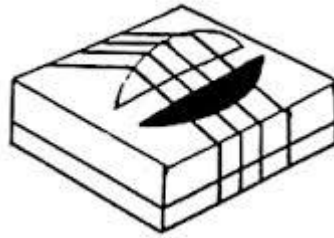
## Practical Science: Sound and hearing

### Make a guitar and a xylophone

#### Guitar:

##### What you need:

A small cardboard box  
Rubber bands



##### What to do:

- Cut the front out of the box.
- Stretch the rubber bands across the open part of the box.
- Watch the rubber bands vibrating to make the sound.

The rubber bands vibrate the air and travel to our ears.

#### Xylophone:

##### What you will need:

5 glasses  
A jug of water

##### What to do:

- Fill 5 glasses with different amount of water.
- The first has only a little, the next has a bit more, the next one has a bit more and the last one is full.
- Use a metal spoon to hit the glasses.

1. Which glass makes the highest sounds?
2. Which makes the lowest?
3. What is vibrating this time?

## **Practical Science: Sound and hearing**

### **Make some pan pipes**

#### **What you need:**

8 straws

Tape

#### **What to do:**

Cut the straws into different lengths.

Place them in order of shortest to longest and tape the together at one end.

To play your pan pipes, blow gently across the top of each pipe. You will find that the longer pipes make a lower sound than the shorter pipes.

1. Which musical instruments are played by blowing?
2. What is vibrating?

## **Practical Science: Sound and hearing**

### **Make a shaker**

#### **What you need:**

Paper cups

Plastic bottles with lids

Rice, lentils, dried beans or peas, sand or pebbles

#### **What to do:**

To make a paper-cup shaker, put a handful of rice or lentils into one cup. Turn another cup upside down and tape the two cups together rim to rim.

To make plastic bottle shakers, pour a handful of dried peas or beans into the bottle and put the lid on tight.

Try making shakers with different sized bottles. You will find that the larger bottles which hold more make deeper sounds.

Experiment with the different fillings. You will find that paper cup shakers with lentils or rice make a softer sound than the plastic bottles with dried beans or peas.

1. Which shaker made the louder sound?
2. Which shaker made the lower sound?

## **Practical Science: Sound and hearing**

### **Make some telephones**

#### **What you need:**

2 clean, empty cans

A nail

A hammer

A piece of string about 6 metres long

#### **What to do:**

- Ask an adult to help you make a hole in the bottom of each can using a hammer and nail.
- Push one end of the string through the hole through the open end of the can to the outside.
- Tie a very big knot (or several knots) to stop the string slipping through.
- Take the other end of the string and thread it through the other can. Tie a knot in the end.
- Give one can to a friend. Walk apart from each other until the string is pulled tight. The string must be very straight and must not touch anything.
- Take turns in talking to each other. One person listens by holding the can to the ear and the other person speaks softly into his/her can.

1. What is vibrating?
2. The sound of your voice is traveling along the \_\_\_\_\_

# Art Year 3

## God is Creator

### Topic: The senses: touch and hearing

**Biblical connection:** God created us with senses to enjoy His beautiful creation, and to communicate with others.

**Bible art as a wall display 1:** The woman who touched the hem of Jesus' clothing

**Bible verse: Luke 8:45:** "Who touched me?" Jesus asked.

**Bible art wall display 2:** Jesus speaking to a crowd of people saying, "He who has ears, let him hear." (Mark 4:9) Show Jesus speaking this verse in a speech bubble.

#### 1. Painting and collage (Touch)

Teach the meaning of the word texture and look for textures in the environment.

- a) Students create art work with different 'feeling' textures: smooth, rough, bumpy
- b) Student create art work that LOOKS as if it has texture, but is actually smooth to touch, e.g. the surface of the moon; a rocky beach

#### 2. Modelling (touch)

- Making a textured surface using sticks, forks and toothbrushes on the clay.

#### 3. Drawing animals and the sounds they make (Hearing)

Students can draw different birds and animals and use speech bubbles to describe the sounds they make, e.g. birds tweet, frogs croak; bees buzz

#### 4. Drawing of painting to music

#### 5. Threads and textiles

Explore the textures of threads and textiles. Create a woven mat using threads or fibres of different textures. Grasses can be included.

Thinking Skills Creator Yr 3

<p><b>Five senses 1</b></p> <p>The answer is:</p> <p><b>our senses.</b></p> <p>Give 5 questions.</p>	<p><b>Five senses 2</b></p> <p>Name 5 things that you could NEVER see.</p>
<p><b>Five senses 3</b></p> <p>Make something that will help blind people.</p>	<p><b>Five senses 4</b></p> <p>Draw 5 things astronauts would see if they travelled around the moon.</p>
<p><b>Five senses 5</b></p> <p>Find 10 different uses for a chair</p>	<p><b>Five senses 6</b></p> <p>Draw a set of head phones.</p> <p>Now redesign it using</p> <p><b>B – make one part bigger</b></p> <p><b>A – add something extra</b></p> <p><b>R – replace one part with something else</b></p>



# Helen Keller

When Helen was little more than one year old, she became very ill. When she recovered from the illness, her parents found that their little girl could no longer see or hear.

It was a frightening experience for a little one year old, to find herself suddenly in a world of darkness. She just clung to her mother's dress all day as her mother went about the housework. Her mother loved Helen very much and helped her understand the world around her.

By the time Helen was five she was able to help her mother fold and put away the clean clothes. She was even able to tell her own clothes from the rest.

Three months before Helen turned seven, a teacher came to live with them. Miss Sullivan would be Helen's own personal teacher. Miss Sullivan taught Helen to understand letters which she would spell into the palm of Helen's hand. Helen could tell one letter from another by feel alone. Soon she was able to put letters together to make words. Helen learned to make words into Miss Sullivan's hand too, and before long they were able to talk to each other using the silent language.

Miss Sullivan then taught Helen to read words, which were written in raised type, on special pieces of cardboard. Helen could read the words by feeling the letters. This was called Braille. Miss Sullivan would play hide and seek with Helen using the Braille word cards. It was Helen who actually thought up the game. One day she pinned the Braille word, 'girl', on her dress and hid in the wardrobe. She had left some other words on the shelf, as clues for Miss Sullivan. The words were: 'is', 'in', "wardrobe". This meant that Miss Sullivan had to go and look for Helen in the wardrobe. She and her teacher played this game for hours at a time.

Because Helen was only one year old when she became deaf, she had not been able to speak with her voice as we do. When Helen was ten, Miss Sullivan heard about a deaf girl in Norway who had been taught to speak using her voice. Helen wanted to try to do this too. It was very difficult because she had to learn how to say sounds by feeling the position of the teacher's tongue and lips as the sound was being made. Then Helen would have to copy what the teacher did. On her first day, Helen had managed to imitate six sounds!

Helen never gave up. She kept trying until she was able to speak using her voice. When she was older, Helen helped others who had problems like herself. She wrote books and travelled the country giving speeches about helping the blind and deaf. She didn't need her teacher any more, but she always remembered Miss Sullivan, who had been so patient and kind to her. Helen thanked God for giving her Miss Sullivan.

*Helen Keller was born in the U.S.A. and lived from 1880-1986.*

*God is Love – Themes for Christian Studies 2*

## **Activities – Helen Keller**

### **PART A**

1. When did Helen become ill?
2. What happened to Helen because of the illness?
3. How did Helen's mother let Helen help around the house?
4. How did Miss Sullivan help Helen?
5. How did Helen learn to speak?
6. Why would we say that Miss Sullivan was patient and kind?
7. If you knew someone who was blind or deaf, how would you show love and kindness to them?

### **PART B - God is love**

**Read:**

God is kind. God is patient. People can show God's kindness and patience in their lives. The Bible says, 'love is patient and kind'. Showing God's love to others is showing His patience and kindness. God wants us to show His love to everyone, especially those who cannot do things as well as we can.

**Copy and fill in the missing words:**

**How can I show God's love to others?**

I can be \_\_\_\_\_ to people who can't do things as well as I can.

I can look out for ways to \_\_\_\_\_ people who have needs.

Missing words:    help    kind

## The sense of touch 1

Student activities

### How do we feel things?

We feel things because of nerves under the skin. Nerves are like little cords that send messages to the brain. They also send messages from the brain back to our body parts.

1. Copy:

We feel things because of ..... under the skin.

Nerves carry m.....

2. Draw some pictures to show the messages that the nerves give us:

This is hot!

This is cold!

This hurts!

This feels soft.

This feels smooth.

3. Think about the way things feel. Things can feel soft, fluffy, slippery, hard, rough or smooth.

Look around the room for three objects and write down what the texture is like.

e.g. The table feels smooth.

4. Now write about three more objects that are not in the room.

A ..... feels .....

A ..... feels .....

A .....feels .....

## The sense of touch 2

### Hot and cold

You can only tell that something is hotter or colder than your skin.

1. Fill a glass with hot water.

2. Fill another glass with ice water.

3. Fill another glass with warm water.

4. Stand the glasses in a line.

5. Put one finger into the hot water and one in to the cold water. Leave them there a minute.

6. Dip the hot finger into the warm water.

How does the warm water feel?

Copy:

When I dip my finger into the warm water it feels .....

This is because the water is not as hot as my .....

7. Now dip the cold finger into the warm water.

Copy:

When I dip my finger into the warm water it feels ..... because

.....

## **The sense of touch 3**

### **Touch test**

We feel things because of the nerves under our skin.

There are feeling points called receptors.

The feeling points can be close together or far apart.

### **Science experiment**

In this experiment you will find out where the receptors are close together and where they are far apart.

Take a polystyrene block and stick two pins in it.

The pin heads are about 1 cm out of the polystyrene. They are the same height.

Get a friend to put a blind fold on.

Press the pin heads GENTLY against your friend's skin at these places:

1. the palm of the hand
2. the fingertips
3. the inside of the arm.

### **What did you find?**

The fingertips can feel things better because the nerve receptors are close together here.

The palm cannot feel as well as the fingertips.

The arm cannot feel things as well as the fingertips or palm.

## **The sense of touch 4**

### **God created us with a sense of touch**

Do you know why?

God is a protector. He gave us the sense of touch to protect us from things we come into contact with.

When we touch something that is hot, we take our hand away quickly. If we left our hand on something hot for more than a second, we would have a very bad burn.

When the weather is cold, we feel cold and know to wear warm clothes. If we wore thin clothes in cold weather, we may catch a cold.

If we touch something sharp, we pull our hand away immediately. If we walk on something sharp, we move our feet so as not to hurt our feet.

The sense of touch one of the many special gifts God gave us when He made us. He thought about everything a human being would need!

Why is the sense of touch important to our safety?

Draw some things that would hurt us if we touched them.

## **Sound and hearing 1**

### **How sounds get to our ears**

1. *What are some of the sounds you would hear if you were camping on a quiet night?*
2. *How would you feel if you couldn't hear anything?*

When you listen to something the sound comes through the ear and it hits the eardrum, then it goes to your brain. Your brain quickly thinks about it and then you will know what to do.

Sound is made by something that vibrates. Vibrate means to move quickly backwards and forwards.

#### **Science experiment:**

If you stretch a rubber band between your hands and pluck it, the rubber band will move back and forth and make a humming sound.

The hum you hear comes from the vibrations of the rubber band. If you touch the rubber band while it is still humming the hum will stop. This is because you have stopped the vibrations.

Place your finger on your throat and hum. You will feel the vibrations. Sound vibrations travel to your ears through the air around us. Sound vibrations traveling through the air are called sound waves.

3. *What are vibrations?*
4. *How do sound vibrations get to our ears?*

## Sound and hearing 2

### The outside of the ear

On the outside, we see the ear flaps. They are the sound collectors. They are called the *pinnae*.

*Why do we have two ears?*

The sound from one direction reaches one ear a tiny bit sooner than the other. Our brain tells us which direction the sound has come from. Then we can turn in that direction.

Try cupping your hand around your ear while you are listening to something. By doing this you will make a larger sound collector and hear the sound more clearly.

Many animals have bigger and better sound collectors than we do.

Animals can turn their ear flaps to the direction of the sound. If you clap your hands near your dog or cat when it's having a sleep, it will turn the ear flaps to pick up the sound.

1. *What are the ear flaps called?*
2. *Write and draw two animals that have bigger ear flaps than we do. Show the ears.*

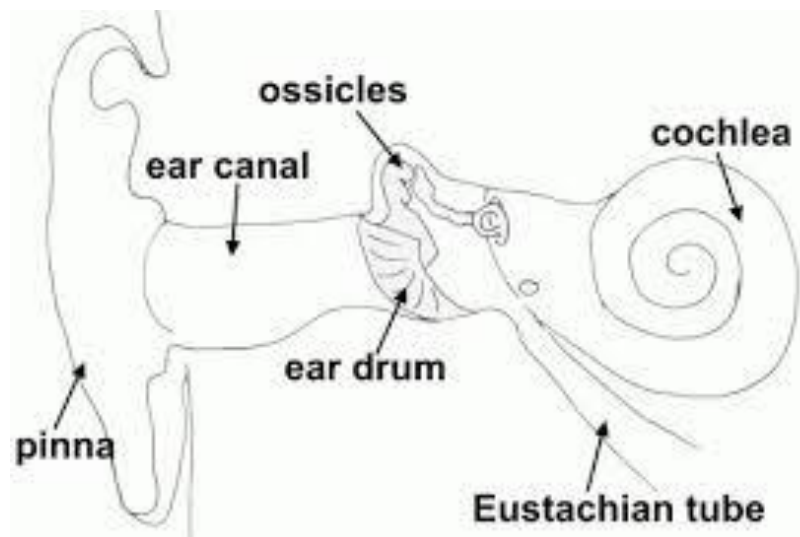
## The sense of hearing 3

### Inside the ear

There are hairs in our ears that are connected to nerves. The nerves carry the sound to the brain. That's when we 'hear' sound.

Never poke anything into your ear because it could get stuck in your ear or you could make a hole in the ear drum. Then it couldn't vibrate properly and you couldn't hear properly.

*Draw and label this picture of the ear.*



## Sound and hearing 4

### Inside the ear

The inside of the ear has different rooms and pathways. The pathways take twists and turns. It begins with the *ear canal*. The ear canal has some hairs and sticky ear wax to trap dirt and stop insects from getting in.

It leads to the *middle ear*.

Stretched across the entrance to the middle ear is the *ear drum*.

The ear drum is a thin piece of skin that vibrates (shakes) when sound reaches it. Behind the ear drum is an open space filled with air. Three tiny bones go across this space. These bones make the sound louder. They are called the *hammer*, the *anvil* and the *stirrup*. Together they are known as the *ossicles*.

The stirrup touches another piece of thin skin called the *oval window*. It covers the entrance to the *inner ear*.

Inside the inner ear is a twisty tube called the *cochlea*. It is shaped like a snail shell. It is filled with liquid and also has thousands of tiny hairs which move back and forth as sound vibrations make the liquid move.

The hairs are connected to nerves which carry sound messages to your brain. That's when you 'hear'.

1. Which two parts are made of thin skin?
2. What do the three little bones do?

## **Sound and hearing 5**

### **Vibrations**

All sounds are made by something vibrating (shaking back and forth very fast). Sound vibrations are called sound waves. They travel can through the air, through water and through solid things. When the vibrations reach our ears, we hear the sound.

When you play a musical instrument, part of the instrument vibrates. That makes the air vibrate. The vibrating air travels to your ear and the inside of your ear vibrates. That's when you hear.

Most sounds reach us through the air. We hear voices this way. We make a sound when our vocal cords vibrate. If you put your hand on your throat and make a sound you can feel the vibration.

Did you know that your voice sounds different to you compared with the way other people hear it? This is because you hear your own voice not just through air, but through the bones in your head.

1. *Draw a picture to show this: a guitar string is vibrating. This makes the air vibrate and it reaches your ear.*
2. *What can sound travel through?*

## **Sound and hearing 6**

### **Types of sounds**

Sounds can be very high-pitched, like a high singing voice. Sounds can be low-pitched like a low singing voice.

Sounds can be loud or soft. Very loud noises make the tiny parts inside your ear vibrate too much. This can cause you to become deaf. Never shout in someone's ear. Keep the volume turned down if you are listening to music through headphones. A loud music concert can make your ears ring for hours afterwards. That's a sign that the loud sound was damaging your ears.

Think of all the beautiful sounds we can hear. God gave us the gift of music. Birds make beautiful music. Think of sounds that make us happy. Laughter makes us happy.

We need to take good care of our ears.

1. Which animal can make a high-pitched sound?
2. Which animal can make a low-pitched sound?
3. How can we damage our ears?
4. What are some of the beautiful sounds God has given us?
5. What sound makes you happy?



## **Sound and hearing 7**

### **Questions and answer about ears**

Work with a partner. One can ask the questions. The other can guess the answers.

Where are the tiniest bones found in our bodies?

Answer: in our ears

Why do our ears have flaps on the outside?

Answer: They are sound collectors.

*Try cupping your hands around your ear while you are listening to something. You will make a larger sound collector and hear the sound more clearly.*

Which animals have bigger sound collectors than humans?

Answer: many animals, e.g. elephant

What is the inside of your ear like?

Answer: It is like a set of rooms with entryways which take twists and turns.

What is the entry way closest to the outside?

Answer: the ear canal

What is in the middle of your ear?

Answer: an ear drum

How does an ear drum help us to hear?

Answer: It has a thin piece of skins stretched across it that vibrates, (shakes) when the sound reaches it.

## **Sound and hearing 8**

### **Animal communication**

Mammals use their sharp sense of hearing to find food, keep out of danger, attract mates and to guard their homes.

Bats hunt at night, using sound to find food, and to find their way around. A bat makes lots of high squeaking sounds, which hit objects, such as insects. The sounds then send back echoes, which the bat picks up with its sharp sense of hearing. It can tell from the echoes what and where the object is. This is called radar.

Dolphins use a similar method of sending messages through the water. This is called sonar. Whales send messages to each other by singing underwater. They have very loud, but very low voices. Monkeys get together in groups and make loud noises to keep other monkeys away from their trees.

*Choose three animals and describe the sounds they make. Explain why they make these sounds.*

## **Sound and hearing 9**

### **People who cannot hear**

Our ears are a special gift from God. But sometimes people are born unable to hear. They are born deaf. This is not how God intended it to be in His perfect creation, but because sickness and suffering came into the world after Adam and Eve sinned, not everything is perfect anymore.

Jesus healed many people who were deaf. How wonderful it was for them to hear for the first time!

People who are born deaf are unable to speak, because to learn to speak we have to be able to hear and repeat the sounds we hear. These people use a special sign language to communicate. They can also learn to understand what people are saying by lip reading.

Some people lose their hearing after sickness, an accident or exposing their ears to very loud noise. They may still have a little bit of hearing, but things sound very soft. These people can use a hearing aid, which is an electronic device placed in the ear to make the sound louder and clearer. If we know that someone cannot hear very well, we should always make sure that we are looking directly at them before speaking.

1. How can people who have hearing problems be helped?
2. How can we communicate with someone who cannot hear, or cannot hear very well?