

# Amazing me! (Foundation and KS 1)

SUPPORT NOTES

Have you ever wondered just how amazing you really are? This interactive show explores how our amazing senses help us figure out what is happening in the world around them. We will also look at the role played by some of the most important organs in our bodies – including the heart, lungs, stomach and intestines. The show ends by considering how our bones and skeleton allow us to move around.



## Purpose of these notes

These notes are intended to provide teachers with a brief overview of the main demonstrations and concepts presented in the show, and to suggest some topics for discussion or follow-up after the show. We also hope that the show will encourage teachers to integrate some of the ideas and techniques that they find useful into their own teaching. If you would like any more information about any of these topics please get in touch with us.

### safety information

Although each demonstration presented in the show only involves everyday equipment, often our own bodies, each activity has been subject to the normal risk assessments. It is important to emphasise that if any of the demonstrations are to be used or adapted for classrooms they should, of course, be thoroughly assessed by each teacher in advance. *Pupils repeating the experiments at home should be encouraged to involve their parents or carers for reasons of both safety and education.*

## Format of the show

Children are fascinated by their bodies and how they work. This interactive show explores just how amazing our senses really are. It uses simple demonstrations, fascinating body facts, music, and lots of audience participation to illustrate how our different senses work together.

All of the demonstrations involve “testing” the senses of volunteers or sometimes everyone in the audience. At this age it is important that these experiments are not carried out in a competitive context. The show will encourage pupils to accept and respect differences between themselves and their friends.

The exact demonstrations used in each show will depend on the length of the show, the age and background of the audience, and any particular topics requested by the teachers.

## Curriculum connections

Our shows are designed to support and enrich the science strand of the revised NI curriculum learning area *The World Around Us* for Foundation Stage and Key Stage 1.

This show, in particular, addresses the following topics:

Interdependence

- a) recognise and name the main external parts of the body;
- b) explore similarities and differences between themselves and other children;
- c) find out about themselves including how they grow, move and use their senses.

## Our amazing senses

We make sense of the many different things happening around us all of the time by using our senses. Each of these senses takes in information from our surroundings and with the help of our brains we can usually work out what is happening. Without our brains we wouldn't be able to figure out what the messages that our senses send us actually mean. The brain also controls every part of our body and everything that we do – walking, eating, sleeping, singing, watching TV. Our brains are about the size of our two fists put together. They are so important to our bodies that they have to be protected from damage by the skull.



Often we need information from more than one sense to understand what is happening in a particular situation. People who cannot see, will find that their other senses work harder instead.

We usually say that humans have five main senses.

## Sight

Vision is most people's best sense – it's how we get most of our information about the world around us. We can see more colours and better detail than most animals, but our night vision is very poor compared to many animals.

We see objects when light from light sources (like a bulb, the Sun, etc) bounces off objects towards our eyes. Our eyes capture this light, focus it and project it onto a small screen on the back of our eyeball. Nerves from this screen send "the picture" of what we are seeing to our brain to try to make sense of it.



Did you know ... that our eyes never grow in size after we are born? The eyes of children are the same size as those of their teachers. This is why young babies with small faces seem to have really big eyes.

How can two people look at the same picture but see different things? In the show we demonstrate how one picture can be seen in two completely different ways – as a duck or as a rabbit. It's not the picture of what we are seeing that is different, but rather how our brains make sense of it.

## Hearing

Sound waves are invisible ripples in the air (vibrations) that travel outwards in all directions from the source of the sound. We cannot see these ripples but our ears can feel them. The flaps of skin on the sides of our head collect these sound vibrations and funnel them towards the most important parts of our ear inside our head. Cupping our hand around our ear can help to collect more of the sound coming from a particular direction. However, this also means that we block sounds from behind our hands – so big ears on other animals do not always mean they have better overall hearing.



The vibrations in the air inside our ears make our eardrum vibrate. This makes small bones touching the eardrum vibrate, which sends ripples through a liquid inside our inner ear. These ripples move nerves in this liquid, and the nerves then send an electrical message to our brains to tell us that we have just heard something.

Did you know ... pupils can hear quiet, high-pitched sounds better than adults?

## Taste

If we take a look at our tongue in the mirror, you can see lots of tiny bumps on the top. Around each bump are lots of taste buds. There are different types of taste buds to detect particular tastes when the saliva in our mouth dissolves the food. There are said to be four basic tastes – bitter, sour, salty, sweet. Can you think of examples of each of these tastes? The bitter taste buds can help to stop us swallowing poisons that are often bitter. Have you ever wondered why ice cream tastes so good when we lick it? Many of the sensors for sweet tastes are at the tip of our tongue.



Much of the information about how food tastes, however, actually comes from our nose. We will try a simple experiment in the show to test how important our sense of smell is when we taste food. Have you ever noticed that when we have a really bad cold, our food tastes very bland? This is because we cannot smell it anymore – the tube that connects our mouth to our nose is blocked up.

## Smell

Our sense of smell is much better than our sense of taste – about 20,000 times more sensitive. Most people can recognise between 4000 to 10,000 different smells. In the show we test a volunteer's sense of smell.

The sense of smell is strongest at birth – so a baby can recognise its mother before the baby's sense of sight develops. As the baby grows, its sense of smell is not as important, and it slowly becomes less sensitive.

Our sense of smell can switch off to certain odours if it gets used to smelling them all the time. Most of us notice that whenever we return home from holiday our house smells funny when we first walk in. This probably isn't because it hasn't been aired for a while. It's more likely to smell like this to visitors all the time – we've just got used to it!



## Touch

Tiny nerves in our skin tell us if surfaces are rough or smooth, hard or soft, hot or cold. Different parts of our body have more nerves in the skin than others. For example, our fingers (and brains) are excellent at working out what they are holding by touch alone – as demonstrated by the objects being felt inside Ned's head. The skin on our fingers has lots of nerves and is much more sensitive than the skin on our arm. There are not as many nerves on our arms so they are less sensitive to touch. This explains why we often can't tell exactly where our back itches – there are relatively few nerves on the skin on our backs.



If the messages sent from these nerves to our brain are too strong (too hard, too hot, etc), this pain warns us something is hurting us so we can take action.

Did you know ... Louis Braille invented the system of reading for the blind, using raised dots on paper, when he was only 12? He had been blind since the age of 3 and was desperate to be able to read as many books as possible.

## Other senses

We actually have more than five senses. For example, if we try to balance on one foot, we will need to use two extra senses as well as our eyes to stop ourselves falling over:

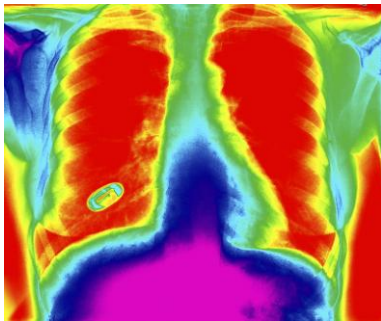
- 1) our eyes help to tell our brains when we are about to topple (try closing your eyes to see the difference this makes)
- 2) our muscles send messages to our brains to tell it what each of our body parts is doing;
- 3) liquid in our ears sloshes around to let our brain know which way is up. Sometimes when we have a really bad ear infection we discover that we can't balance properly or even stand upright. This is also why we feel dizzy after spinning around – the liquid in our ears keeps spinning for a while (telling our brains we are still moving), but our muscles and eyes tell our brains we have stopped – so our brain gets confused by these mixed messages.



## Our amazing organs

In the show we use an organ tunic to show some of the major organs and to discuss what roles they play inside our bodies. At this early level the organs are discussed in terms of very simple ideas as an introduction to later work, but additional information is provided below.

**Heart** – A group of strong muscles in your chest that pump blood around the body – a bit like “the engine” of the body. It pumps **blood** around the body all of the time, even when we are sleeping. The blood contains oxygen from the air we breathe and nourishment from the food we eat, and takes these vital supplies through blood vessels to all of the organs of the body to give them energy so they can do their job.



**Lungs** - When we breathe in deeply you can feel your lungs fill with fresh air like two balloons. They send the part of the air that our bodies need (the oxygen) into the blood stream. Then your lungs push the used air out again, ready to take another breath all over again.

**Stomach** – We need to eat food so that our bodies can grow and so we have enough energy to move and do all the things we take for granted everyday. When we eat the food gets passed into our stomach where it begins to get broken down. A meal spends about 4 hours in your stomach. The thick liquid that your food has become is then passed into your intestines.

**Intestines** – The small intestine is a long coiled tube (about 6m in length) that helps to break down or digest the food even more. The good parts of the food are then absorbed into the blood, and after about 6 hours the leftover water and waste are passed into the large intestine. This is a smaller tube, despite its name, which absorbs the water and then passes the waste out of your body.

Each of the other major organs in our bodies have their own jobs eg our kidneys help to clean our blood.

## Our amazing bones and muscles

The skeleton is a framework of **bones** that holds the body up and protects the soft organs underneath. When you are born you had over 300 bones but some of these fused together as you grew, so that you now only have 206 bones. In the show we look at X-ray pictures of various bones. Your bones are connected by joints that allow them to move, a bit like hinges.



The word “muscle” comes from “mouse”. People long ago thought muscles looked like mice running around under your skin.

The **muscles** attached to your bones are what makes them move. Muscles can stretch and shrink like rubber bands. You have over 600 muscles that you can control, but there are hundreds more that you cannot consciously control.

Perhaps one of the most amazing things about our bodies is that our senses, our brain, our organs and our bones and muscles are all connected so that they can work together.

## Sources of more activities and information

### some more activities

There are lots of simple and fun activities relating to the senses that you might like to try after the show with pupils:

- Ask pupils to find their favourite optical illusion from books and several internet sites. Encourage them to draw their own versions of the selected illusion, and then show it to other classes with an explanation of how scientists think that the illusion works.
- Look at your eyes closely in a mirror. Close your eyes nearly shut, then open them quickly whilst you stare at the mirror. You should see the black pupil in the centre of your eye shrink as more light floods into your eye.
- Why do we need two ears? Whilst blindfolded try to locate which direction the sound from a radio is coming from as it is moved around the room. What happens when you block the sound coming in one ear?
- Stretch some cling film over a large dish and scatter some rice on top. What happens to the rice when you play a drum near the dish? How do you think this could be used as a simple model for the ear?
- Have pupils design and build feely boxes with everyday objects. They can then test how well others can recognise the objects they have chosen.
- Carefully hold one or two pencil tips against different parts of a volunteer’s skin and see if you they can feel whether you are using one or two pencils (without peeking). Is it easier to tell this on your hand or your arm?
- Blindfold a brave volunteer and carefully feed them different foods whilst waving a cut onion underneath their nose. How does the smell of the onion affect the taste of the food according to the volunteer?

Many more similar activities are described in the books listed below.

### books

- “Head to toe science”, Jim Wiese, John Wiley, NY;
- “The human body for every kid”, Janice van Cleave, John Wiley, NY;
- “The body owner’s handbook”, Nick Arnold, Horrible Science series, Scholastic;
- “Body – bones, muscle, blood and other body bits”, Secret Worlds series, Dorling Kindersley.
- “How your body works”, Judy Hindley and Colin King, Usborne.

### web sites

- [http://www.kidshealth.org/kid/closet/experiments/experiment\\_main.html](http://www.kidshealth.org/kid/closet/experiments/experiment_main.html)
- <http://www.faculty.washington.edu/chudler/chsense.html>