Chapter 22

Vision, Hearing and Touch

Day One:

Today, you and your child will:

1. Read the text
2. Review the text with your child
3. Complete the student worksheets
4. Collect the materials you will need for days two and three

National Science Education Standards covered this week:

The behavior of individual organisms is influenced by internal cues (such as hunger) and by external cues (such as a change in the environment). Humans and other organisms have senses that help them detect internal and external cues.

The senses of vision, hearing and touch are all external senses as they are all linked to activities that take place outside of our bodies. The largest sense organ belongs to our sense of touch as nerve endings surround our entire body. Not all areas on our bodies are as sensitive as others. This is due to the amount of nerve endings that exist in particular places of our bodies.

Definitions

Pupil	the black "dot" in your eye where light enters your body
Iris	the colorful portion of your eye that changes the size of the pupil
Retina	takes a picture of anything you see and sends it to your brain
Eyebrows	bushy strips of hair above your eyes that help to keep sweat from dripping into your eyes
Eyelashes	protective hairs that "sweep away" any bad stuff in the air that may get into your eyes
Eyelids	protective skin that can surround the eye and sweep away dirt and other junk that gets on your eyeballs
Tears	fluid that is made by your eyes to keep them wet and clean
Sound waves	vibrations that cause any kind of noise
Eardrum	part of your ear that vibrates when sound waves hit it
Cochlea	"coke-lee-ah"; looks like a seashell and is filled with fluid; when sound waves vibrate the eardrum, tiny hairs inside this structure vibrate too; each hair sends a different message to the brain
Nerve endings	areas in your skin that sense the feelings of heat, cold, pressure, pain and taste

Sample questions to ask your child after completing the weekly reading.

What are your sense organs for vision, hearing and touch?

Eyes, ears and skin.

What structures on your face do you use to protect your eyes?

Eyebrows, eyelashes, eyelids and tears.

What can you find inside your cochlea? Why is it important?

Inside your cochlea you will find many hairs. These hairs vibrate to the sound waves that enter through the ear. As these hairs vibrate, they each send a message to the brain which identifies what it is you are listening to.

Is your tongue very good at sensing things that are hot? Why or why not?

Your tongue is not very good at sensing things that are hot or cold. This is because there are very few nerve endings on the tongue that are used to identify temperature. Your fingers, however, are very good at determining temperature.

Answers to worksheet questions:

Page 1:

(Word search)

Page 2:

8 - pupil

4 - iris

5 - retina

1 - eyebrows

11 - eyelashes

3 - eyelids

9 - tears

10 - sound waves

2 - eardrum

7 - cochlea

6 - nerve endings

Page 3:

1. C
2. C
3. B
4. C
5. C
6. A

Day Two:

Today, you and your child will:

1. Review Day One using the following text
2. Run the first activity this week

The following text will give you the most important items to review for your activity today.

Sound waves can be bounced within a solid object and directed into different positions. This usually takes place inside a speaker.

Should the sound waves be allowed to bounce back-and-forth inside a closed structure, the intensity of the sound can be increased. This is what happens inside of a megaphone. It also occurs within the ear canal.

The construction of a simple speaker from this activity simulates the actions of our ear canal as sound waves are collected, trapped and analyzed by our sense organs.

A cup of sound

Objective:

Children will create a homemade speaker

Materials:

small paper cup
2 feet of string
one toothpick
small source of water

Procedure:

To build this device, poke a hole in the bottom of the cup using the toothpick. Tie the string around the toothpick and insert the free end of the string into the hole through the inside of the cup.
Break off the sides of the toothpick so that when you pull down on the string, it rests securely inside the cup.
Now, wet your fingers and pull down on the string. This noisemaker is hard to keep quiet.

Explanation:

The water on your fingers creates friction between your fingers and the string. When the wet fingers are pulled down the string, the friction you create causes uneven pressure along the string and creates vibrations. The vibrations travel up the string to the cup. The cup vibrates along with the string; however, the vibrations cause sound waves to form inside the walls of the cup. The sound waves bounce back and forth inside the cup increasing the intensity of the sounds you hear.

Day Three: Lab Activity

Today, you and your child will:

1. Review Day One using the following text
2. Run the first activity this week

The following text will give you the most important items to review for your activity today.

Unlike some organisms, human eyes are positioned in the front of the head. This allows us to use both eyes to identify the relative distance that exists between ourselves and what we are focusing on. This is known as our depth perception.

By impairing our vision, our depth perception is not as efficient and it requires practice to be able to judge distances once again.

ESP Activity: Touch the dot

Objective:

Depth perception is explored as students intentionally impair their vision.

Materials:

pencil
notebook/typing paper
measuring tape

Procedure:

Draw a fairly large dot (about 1 inch) onto a piece of paper. Place the paper on a table approximately 2-3 feet in front of you.
Close one of your eyes with one of your hands.
Use the opposite hand to attempt to touch the pencil point to the dot. Measure and record the distance between your pencil mark and the original dot.
Change eyes and use both eyes for experimentation.

Explanation:

You will find it increasingly more difficult to touch the dot without the use of one (or both) of your eyes. Humans use both of their eyes to determine their relative distance to other objects. By impairing your vision, your perspective is altered.

Independent variable: Number of eyes used
Dependent variable: Distance from the dot
Hypothesis:
If the number of eyes used is (increased/decreased), then the distance from the dot will (increase/decrease).