

WHAT IS SOUND?

WHAT IS THE SOUND ENERGY? _____

WHAT IS SOUND? _____

HOW IS SOUND PRODUCED? _____

HOW DOES SOUND TRAVEL? _____

TYPES OS WAVES _____

ELE MENTS OF SOUND _____

DETECTOR (OUR HEARING SENSE) _____

EMISOR - CODE - RECEPTOR (COMMUNICATION) _____

FIRST SESSION

HOW IS SOUND PRODUCED? SOURCE



FOURTH YEAR PRIMARY EDUCATION

What is sound? Autora: Asunción López Espín. CBM Ntra. Señora de los Ángeles. El Esparragal, Murcia.
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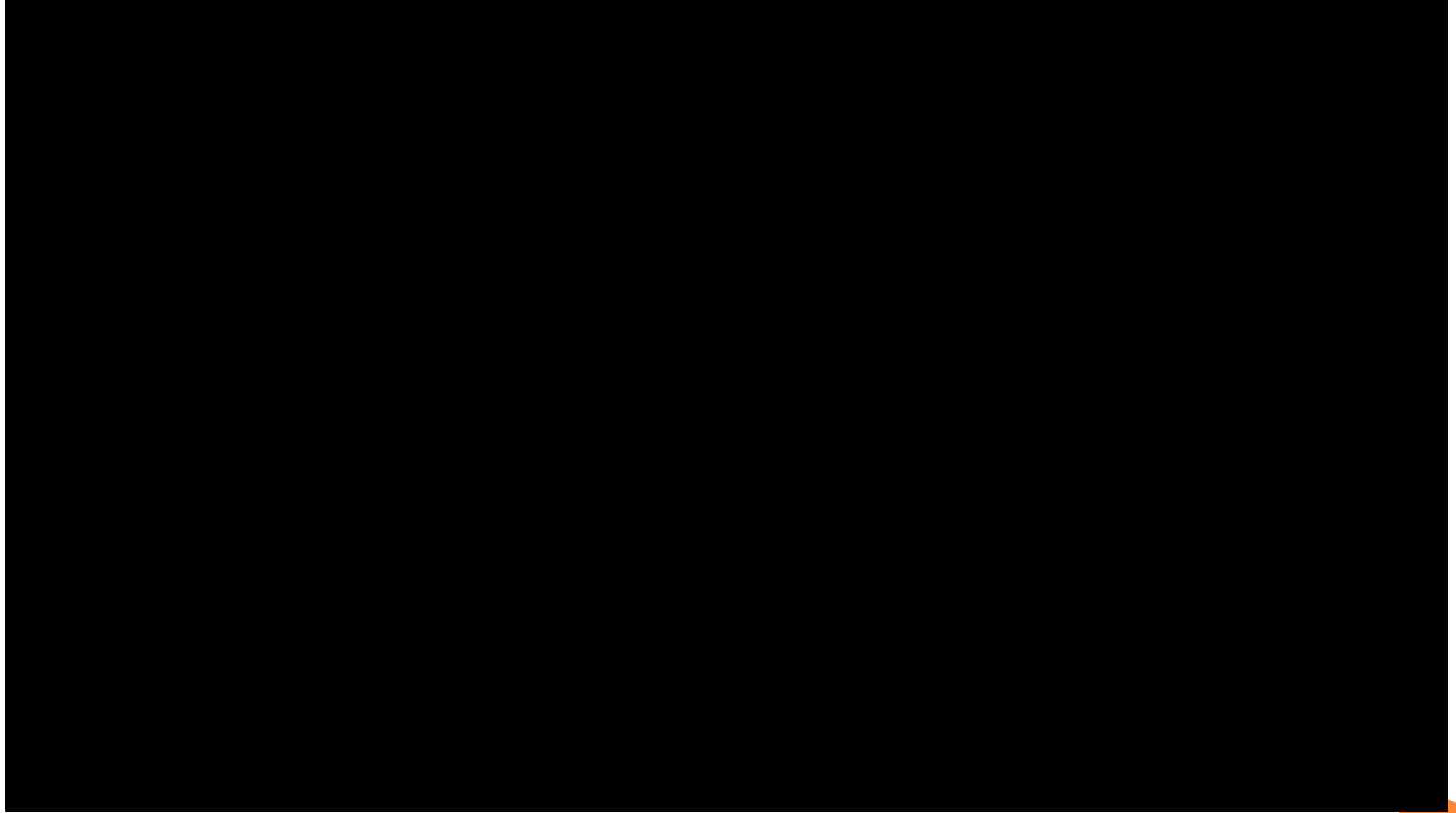
FIRST SESSION PLANNING

- We are going to start this unit by detecting the previous knowledge of our students. For this reason, we have prepared a worksheet with some questions that they have to answer in pairs or threes (annexes). But before doing this, we are going to do a Brainstorming exercise to know what they already know and what they want to know about sound.
- After sharing the hypothesis and ideas we will start with the experiments. Let's make noise : whistle, shout, hit tables, speakers...
- Experiments:
- First: we will use speakers: We will use styroflex balls, candles, bubbles maker, etc... to show how the membrane of the speakers vibrates. Our students will appreciate how the candle's flame moves and the bubble vibrates too.
- Second: we will make a foneindoscope (toilet paper, wax paper, rubber band and aluminium paper). This way our students will see the vibrations.
- Students will learn the first element of sound:
- The source: sound waves vibrate and produce oscilations. Using longitudinal waves, these vibrations travel from one point to another.
- OUR STUDENTS DRAW THE EXPERIMENTS
- AND CONCLUSIONS





AMAZING RESONANCE EXPERIMENT





FIRST SESSION CONCLUSIONS

You need for the experiments: SPEAKERS, STYROFLEX BALLS, PASTRY, CANDLES, BUBBLES, TOYLET ROLL, WAX PAPER, RUBBER BAND AND ALUMINIUM PAPER

- The experiments have shown us that SOUND origin is a vibration.
- Summarising: Sound vibrations create sound waves which move through mediums such as air and water before reaching our ears.

SECOND SESSION HOW DOES SOUND TRAVEL?

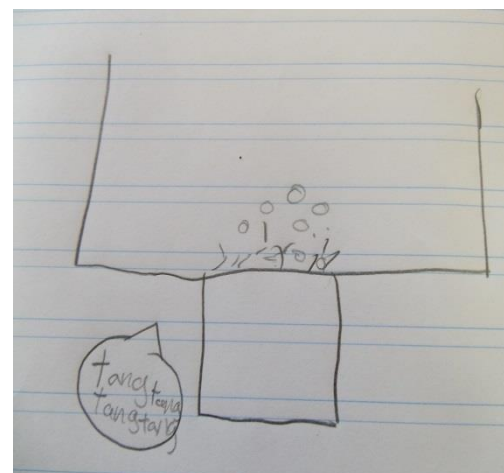
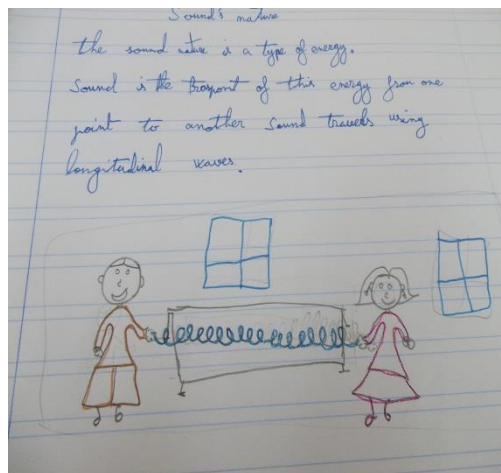
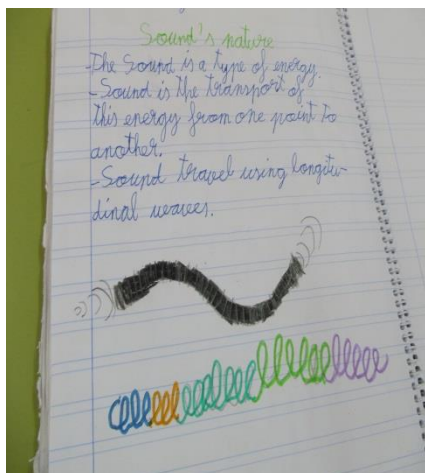


FOURTH Year Primary Education

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SECOND SESSION PLANNING

- Objective: Learn that sound Waves travel by air in longitudinal waves.
- Acting out: Matter in three states: gas, liquid and solid.
- Experiments:
- First: we are going to work with tubes. Our students will see that sound travels through air but if there is no air, they listen to the sound from their partners too.
- Second: Represent longitudinal waves with the students. Use a metal spring to show how it works.
- Conclusions:
- In this second session our students have learned that sound uses longitudinal waves to travel. So we already know that the sound is the transport of energy from one point to another as well as that the sound uses longitudinal waves to travel.



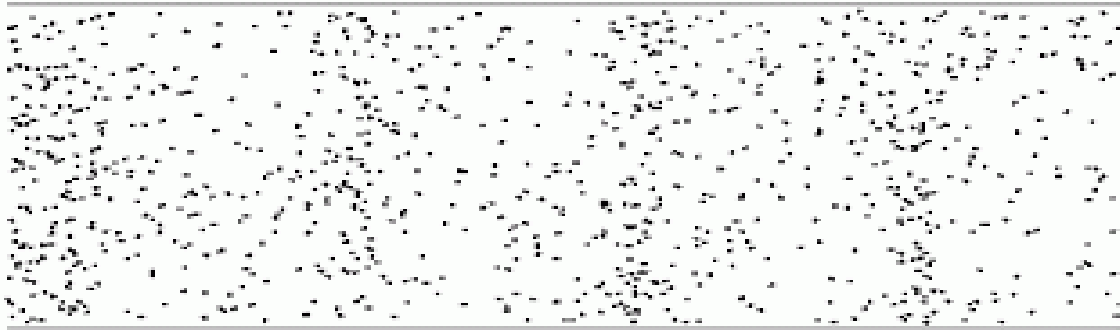
LONGITUDINAL WAVES IN SLOW MOTION



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LONGITUDINAL WAVES IN MOVEMENT

- Molecules are pushing each others like balls. But they comes back to its position.



STUDENT: _____



SECOND SESSION CONCLUSIONS

- In this second session our students have learned that sound uses longitudinal waves to travel. So we already know that the sound is the transport of energy from one point to another as well as that the sound uses longitudinal waves to travel.

THIRD SESSION

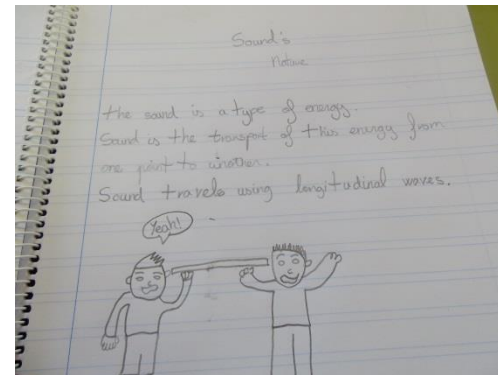
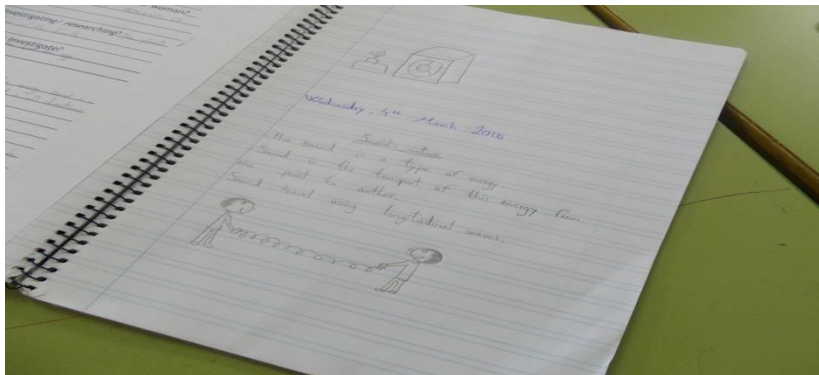
HOW DOES SOUND TRAVEL?



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THIRD SESSION PLANNING

- In this session our students will experiment with different materials to see if they can listen through different mediums: air, water and solid.
- Experiments:
- First: Use balloons filled with air and water. Students will listen to sounds by putting their ears on the balloons and making noise.
- Second:
- With some material to make a vacuum we will use a mobile phone to show our students that sound cannot travel in vacuum conditions.
- Conclusions:
- Sound can travel through gas, liquid and solid. Sound cannot travel in vacuum conditions.
- Finally I will give out photocopies with the biography of Galileo Galilei, the first scientist who tried to measure the speed of sound. In the next session we will read it and we will comment on the experiment he made or he carried out.





THIRD SESSION CONCLUSIONS

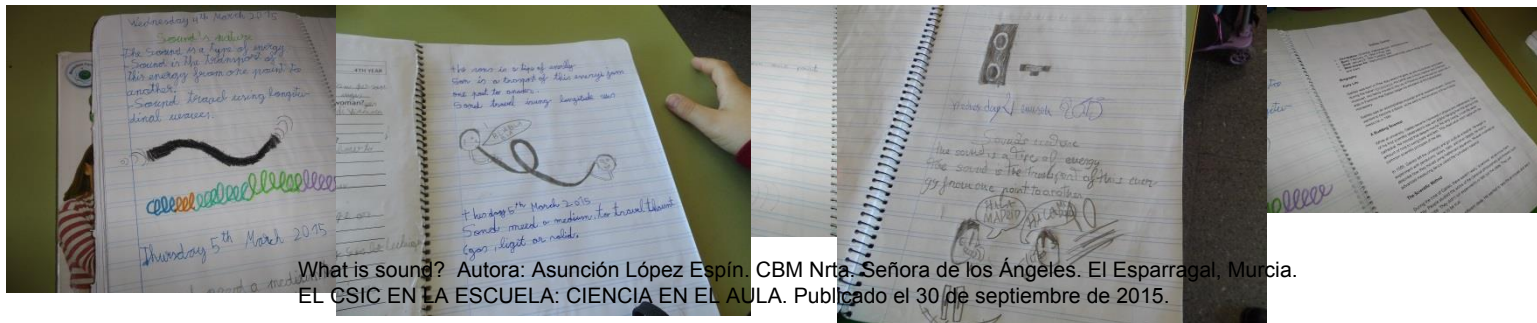
- Sound can travel through gas, liquid and solid. Sound cannot travel in vacuum conditions.
- Finally I will give out photocopies with the biography of Galileo Galilei, the first scientist who tried to measure the speed of sound. In the next session we will read it and we will comment on the experiment he made or he carried out.

FOURTH SESSION



FOURTH SESSION PLANNING

- We start the lesson by reviewing what we have learned:
- Sound's Nature
- The source: sound waves vibrate and produce oscillations (a repetitive movement).
- Medium: sound waves need a medium to travel through (matter).
- After reading the biography of Galileo Galilei, we will watch a video and a power point presentation. We will comment on the experiment Galileo made to try to measure the speed of sound.
- Then we will start with the experiments.
- First: with plastic cups and rubber bands we will make noise.
- Second: We will use the straws for the same purpose.
- Third: with combs and wax paper we will make sound.
- Our students have to explain the process in order to detect if they have understood the concepts of sound, source, medium, vibration, longitudinal waves, low or high pressure areas of molecules, etc...





GALILEO GALILEI BIOGRAPHY

Family Sing Along **MUFFIN SONGS**



WWW.MUFFINSONGS.COM
INFO@MUFFINSONGS.COM



FOURTH SESSION CONCLUSIONS

- First our students have to explain the process in order to detect if they have understood the concepts of sound, source, medium, vibration, longitudinal waves, low or high pressure areas of molecules, etc...
- After that They are going to experiment with the material. Finally they will draw the experiment they have done.

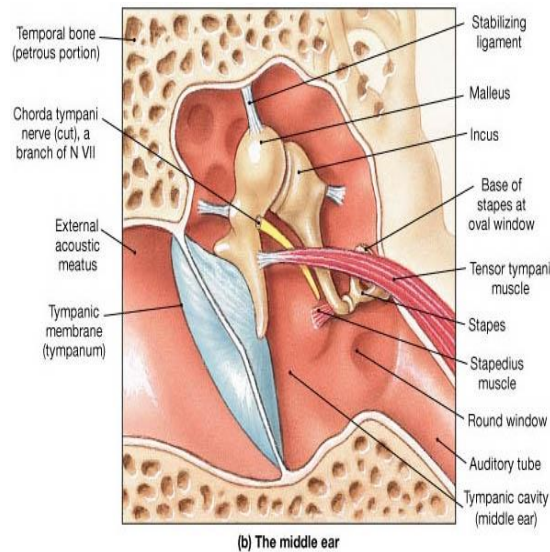
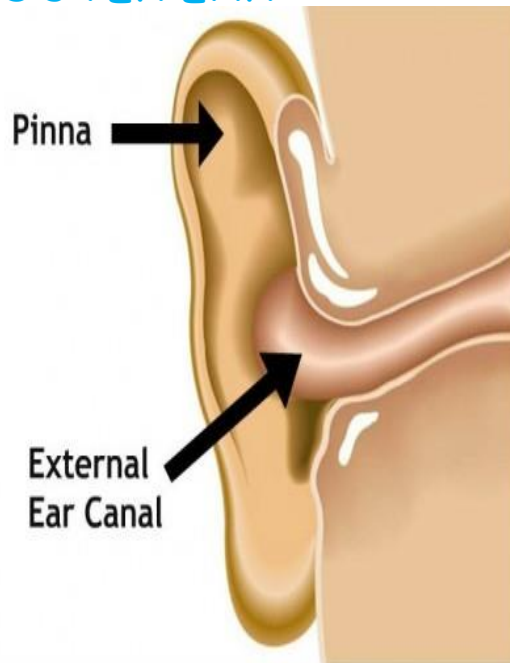
FIFTH SESSION



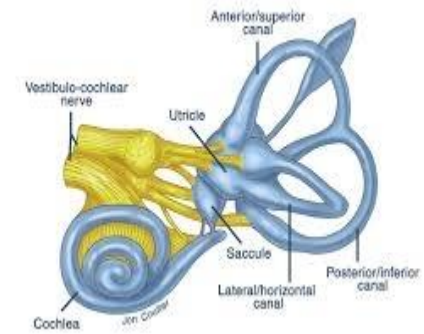
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PARTS OF THE EAR

OUTER EAR



MIDDLE EAR



INNER EAR

FOURTH YEAR PRIMARY EDUCATION

DETECTOR (OUR HEARING SENSE)

How our ears work.....



FOURTH YEAR PRIMARY EDUCATION

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SOUND ELEMENTS

SOURCE:

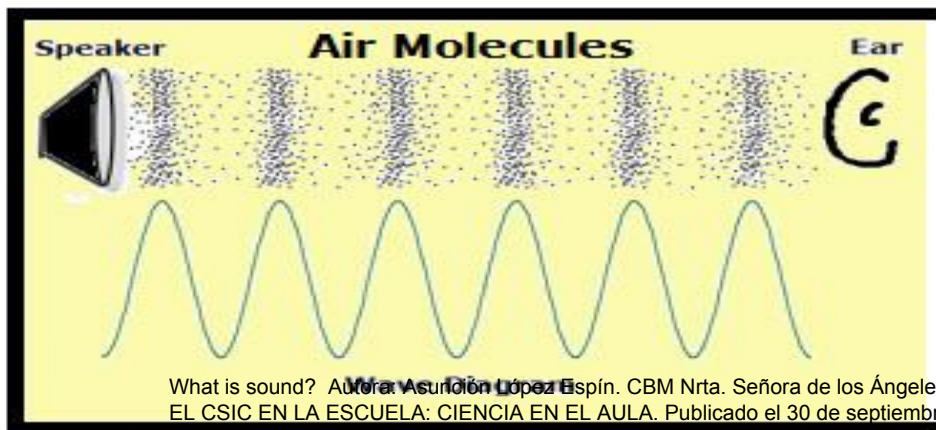
MEDIUM:

DETECTOR:

Sound waves vibrate and produce oscillations. Using longitudinal waves, these vibrations travel from one point to another.

Sound waves need a medium to travel through (matter).

We hear sound when sound waves enter our ears.



Summarising: Sound vibrations create sound waves which move through mediums such as air and water before reaching our ears.



FIFTH SESSION PLANNING

- In this session we will deal with the last element of the sound:
- Detector: How we hear. Our sense of hearing. Parts of the ear: outer ear (ear), middle ear (eardrum and the three small bones) and inner ear (chloquea and auditory nerves).
- We have got two ears because we hear in stereo, which means that sound enters our ears using two different channels. But we can also hear spatially and it is due to the ability of our brain to evaluate the available signals in relationship to each other.
- Experiments:
- First: with a sleeping mask, some volunteers are going to listen to different sounds and they have to point to the direction they think the sound comes from.
- Second: with special headphones we can see that we can alterate the reception of the sound.
- Finally we will study the Information Theory
- Emisor_____Code_____Receptor
- We will make a telephone with plastic cups and string.
- Get a piece of string and two empty cans (preferably soup cans)
- Punch a hole at the bottom of each can just small enough for string to fit through.
- Pass the string through the hole and into the bottom of one can or cup.
- Tie a knot in the end of the string that is inside the cup.
- Place the untied end of the string through the bottom of the other can or cup.
- Get a partner and talk!!



Fifth Session Conclusions

We have got two ears because we hear in stereo, which means that sound enters our ears using two different channels.

But we can also hear spatially and it is due to the ability of our brain to evaluate the available signals in relationship to each other.

FOURTH YEAR PRIMARY EDUCATION



OTHER EXPERIMENTS.....



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FOURTH YEAR PRIMARY EDUCATION

COPIA DE LA ACTIVIDAD REALIZADA EN EL AULA. Publicado el 30 de septiembre de 2015.



CONCLUSIONS

- Sound's elements:
- The source: sound waves vibrate and produce oscillations. Using longitudinal waves, these vibrations travel from one point to another.
- Medium: Sound waves need a medium to travel through (matter).
- Detector: we hear sound when sound waves enter our ears.
- Summarising: Sound vibrations create sound waves which move through mediums such as air and water before reaching our ears.



RECAP

- Sound is a type of energy
- Sound is the transport of this energy from one point to another
- Sound is produced by vibrations
- Sound travels in all directions and through objects
- Sound uses longitudinal waves to travel
- The elements of the sound are:
 - a)SOURCE (VIBRATIONS)
 - b)MEDIUM (SOLIDS, LIQUIDS AND GASES)
 - c)DETECTOR (OUR EARS)
- Detector: How we hear. Our sense of hearing. Parts of the ear: outer ear (ear), middle ear (eardrum and the three small bones) and inner ear (chloquea and auditory nerves)
- The Information Theory
- Emisor_____Code_____Receptor



FINALLY

- We answer all the questions that we got at the beginning of the project.



WHAT IS SOUND?

WHAT IS THE SOUND ENERGY? _____ IT'S A TYPE OF ENERGY

WHAT IS SOUND? _____ IT'S THE TRANSPORT OF THIS ENERGY FROM ONE POINT TO ANOTHER.

HOW IS SOUND PRODUCED? _____ IT'S PRODUCED BY VIBRATIONS

HOW DOES SOUND TRAVEL? _____ TRAVELS IN ALL DIRECTIONS AND THROUGH OBJECTS

TYPES OF WAVES _____ TRANSVERSAL AND LONGITUDINAL WAVES. SOUND USES LONGITUDINAL WAVES.

ELEMENTS OF SOUND _____ SOURCE (VIBRATIONS) – MEDIUM (SOLIDS, LIQUIDS AND GASES) – DETECTOR (OUR EARS)

DETECTOR (OUR HEARING SENSE) _____ OUTER/MIDDLE/INNER EAR

EMISOR - CODE - RECEPTOR (COMMUNICATION) _____

THERE IS A MESSAGE TRANSMITTED BY AN EMISOR THAT USES A CODE WHICH HAS TO BE DECODED BY THE RECEPTOR