HISTORY OF SOUND

Sound is a form of energy: it is the physical consequence of the vibration of a material, which is transmitted in the air.



To perceive a sound, you need a living body equipped with an auditory system like human hearing.



Sound is different from noise (chaotic or even unpleasant), and from the musical note, which sets a sound at a particular frequency (pitch).



When it carries information, sound becomes language.



Among the oldest musical instruments, we know the prehistoric flutes made of bone or wood (50-60'000 years old).



Until the emergence of writing, language was oral: it was primarily a sound reality.



From the second half of the 19th century, different systems were invented to record sound: the phonautograph (1857), the paleophone (1877), the phonograph (1877), the graphophone (1886), etc.



During the 20th century, many other recording formats emerged,



such as shellac (78 rpm), vinyl (33 or 45 rpm), polycarbonate (CD, laserdisc) or magnetic tape cassettes.



At the beginning of the 21st century, streaming began to replace physical media.



An estimated 25% of audio streaming platform users are located in Europe.



A vintage record player uses 5 to 10 times less electricity than a computer or smartphone.



Streaming relies on gigantic server farms to broadcast to individual devices.



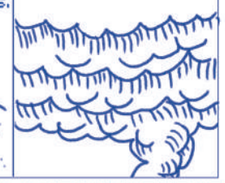
The network infrastructures needed to distribute audio are everywhere: on land, under the ocean, in the air.



In 2024, there are around 9 billion smartphones in use – more than the number of living human beings.



300 million tons of CO2 are emitted every year due to global streaming.



HISTORY OF PAPER

Cellulose is the most widespread natural organic substance in nature.



Paper is an agglomerate of it. Wood also contains it (around 50%).



The manufacture of paper is linked to the emergence of speech and writing.



It allows information to be recorded and kept track of it.



The invention of paper is attributed to Cai Lun, around 105 AD, in China.



He created it from mulberry bark and hemp rags.



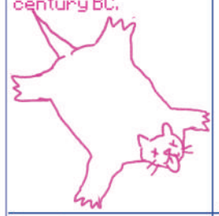
Before paper, people wrote on different supports such as stone, clay tablets, metals, wood, turtle shells or dried leaves rubbed with oil.



The Egyptians invented papyrus in 2500 BC.



Parchment was used from the 2nd century BC.



In the Middle Ages, paper was made from linen and hemp rags that were soaked in water and crushed.



Thanks to the invention of water mills, it was possible to work with a millstone, rather than by hand using a pestle.



Rags became scarce from the 18th century onwards, engineers and papermakers looked for new solutions.



Several works were then printed on different plants. Then in 1840, Keller invented wood pulp which is still used today from resinous trees such as pines or spruces.



In France, 60% of used paper and cardboard are recovered.



Recycled paper already existed in China in the 10th century, but its grayish appearance is less appreciated.



The operation remains expensive and polluting – elimination of unwanted elements, de-inking with sodium hydroxide, bleaching with chlorine.



HISTORY OF PIXEL

A pixel is a point of light.



It is part of a grid of points that can display digital information and images.



If the word pixel was first used in 1965, it is the contraction of the expression "picture element", which appeared in 1927.



and designates the same "point" of a mosaic of points as the word "Bildpunkt", which appeared in the German language in 1888.



The upcoming arrival on the market of quantum displays will be the death of the pixel.



The mosaic of points of these screens will be made up of 3D micro-pearls.



The mosaic is the ancestor of pixel art.



To build objects, humans fragment them into smaller elements. The oldest known mosaic was found in Çatalhöyük (present-day Türkiye).



With its brick (adobe) constructions, this 9000-year-old site bears witness to the transition from pastoralism to sedentary lifestyle. Mosaic uses clay, stone, glass, or other materials.

Fragmentation is also at the heart of the photographic decomposition of movement (1882), heir to the ancestors of animation: the thaumatrope (1825), the phenakistoscope (1832) and the zoetrope (1834).

Unlike mosaic, digital image distribution systems require rare materials, such as ores or metals

Their industrial extraction poses enormous ecological, ethical and geopolitical problems.

Defective electronic machines are rarely repairable. The amount of electronic waste produced increases every year, and their storage is a crucial problem.

SUMMARY DIAGRAM OF TIME SCALE, AVERAGE DURATIONS:

the formation of mountains	the formation of petrol	the formation of sand	the formation of humus	life of a tree	life of a book	life of a human	life of a computer
10 million years	millions of years	thousands / millions of years	hundreds of years	300 years	100 years	70 years	10 years

INTERVIEW

What futures do you want to live in? Imagine a desirable future.

Fill in the radar (diagram below)
→ Rate the importance of the following categories from 1 to 5:
1 = close to the center
5 = far from the center

- *work*
- *fun*
- *technology*
- *progress*
- *wild plants and animals*
- *domestic plants and animals*

→ connect the dots and interpret the shape

Ask other people about their desired futures

→ imagine a question of your own and write it down below
Some ideas for questions:
Project yourself into the future.
In 10 years: what does your house look like?
In 20 years: what is your job?
In 30 years: how do you get around?

Your question :

_____

_____

WE

SOUND :
PAPER :
PIXEL :

Rules:
Pixel fills paper.
Paper steals sound.
Sound distracts the pixel

The workshop was designed as part of Codename Seedling, a project supported by Erasmus+

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Graphics: Diego Verastegui.
Special thanks to: Melanie Frances, Zunaira Malik, Elvira Crois

PROTOCOL

Continental drift occurs over hundreds of millions of years.
– Breathe as slowly as possible

It takes tens of thousands of years for a cave to form.
– Breathe even more slowly

The average lifespan of a tree is about 100 years.
– Breathe normally

The average lifespan of a book is about 200 years.
– Take a sheet of paper, tear it in 2 then in 2 then in 2

Currently, 42% of the trees in the world are used to make paper.
– Breathe quickly, tear faster and faster

It is difficult to recycle the components of a computer by yourself.
– Tear the paper as slowly as possible

On the other hand, the entire web is remixable.
– Put the paper in a shredder

A bit like this paper.
– Shred paper

What if we remade the world out of paper?
– Create several continents from recycled paper and cardboard

What if we talked about the future?
– Interview people about their dreams

What if we added life?
– Beam animated drawings on the sculpture with Fragmenter Animated Loop Machine

You are time

You act on a geological scale

Start the activity.

HOW TO DO IT?

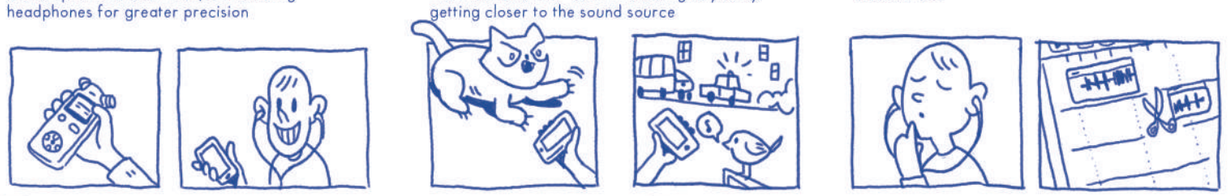
SOUND

1- Le field recording designates the audio recording of natural sounds and sounds from human environments (factories, busy streets, car noises, etc.).

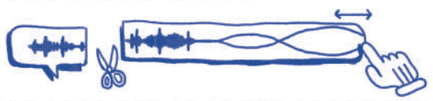
1- Get a device to record sounds (a recorder, or a smartphone to start with). Listen using headphones for greater precision

2- Capture the sounds of your environment; zoom in on elements that seem interesting to you by getting closer to the sound source

3- You can listen to them again, cut them out to make an edit



2- Editing - Audio editing is done using software to process sound, such as Audacity (free). Cut parts of your audio track, remove empty areas, remove background noise. You have a bank of samples. With your audio software, you can also stretch the sound and make it slower, or reverse the direction of the sound.



3- Effects - Most audio software offers sound effects, such as reverb, which gives persistence to the sound (like in a church), or other temporal effects ("delay", "echo"...). Delay, or "delay", repeats a sound at different time intervals (like in a canyon).



PAPER

1- Papier mâché - To make papier mâché (paper pulp), you need newspaper, water and glue (glossy paper dissolves poorly in water).



1- Tear the paper into confetti (be careful, remove the staples).

2- Moisten the paper with hot water.

3- Mix with a hand blender until you get thin films (add water accordingly).

4- Wring out the paper in a cloth.

5. Make your own flour-based glue (You can also use wallpaper glue, wood glue or acrylic glue).

mix 1 glass of flour + 1 glass of water + 1 tablespoon of fine sugar



Cook over low heat

mix with a whisk to avoid lumps.

6- The glue has a thick and creamy consistency but you can add water to make it more liquid.

7- Mix the glue with the paper and knead your dough with love. Use freely, or flatten with a roller to dry.

2- Dead leaves mâchées -
You can also make a pulp from organic waste, such as dead leaves. The method is the same as for paper, but the raw material is less homogeneous. When you prepare it yourself, the final product looks like lace: it is more delicate and fragile than paper.



3- Terraformation in recycled materials -
You can use different recycled materials to build volumes:



I Load-bearing **underground** structures with cut cardboard (notch systems, reinforced frames)

II Create **landscapes** and **terrain** from free-form volumes in papier-mâché (paper balls, flat shapes)

III Wet newspaper sheets and stretch / superimpose them to create flat surfaces like **geological layers**

PIXEL

1- Fragmenter : animation / digital drawing - Animation gives the illusion of movement to a chronological sequence of images (drawings, photographs). Fragmenter Animated Loop Machine records each line of a drawing independently and allows them to be replayed in a loop, creating live animation.



Using a graphics tablet, a computer and the Fragmenter Animated Loop Machine software, draw colored shapes: lines come to life by themselves. Change the parameters and effects live: you have (re)discovered VJing.

2- Mapping - Video mapping consists of projecting digital images onto volumes or onto structures in relief, in order to create animated frescoes. Using a video projector, project a Fragmenter animation onto a papier-mâché sculpture: the structure comes to life.



Identify a few points of interest in the space. By hovering over the tablet with the stylus, place landmarks on a layer. On a new layer, draw lines or color areas around the landmarks. Repeat on other layers, with other landmarks and other ideas for drawing in motion (symmetry, frame-by-frame, etc.).

3- Contour lines - In cartography, a line formed by the points of the relief located at the same altitude is called a contour line. These lines are used to represent in 2D the shapes and altitude of mapped areas.

With Fragmenter, draw in mapping by connecting points on the papier-mâché sculpture: it takes on relief. Add animated colored areas: the sculpture becomes a world in fast motion.



