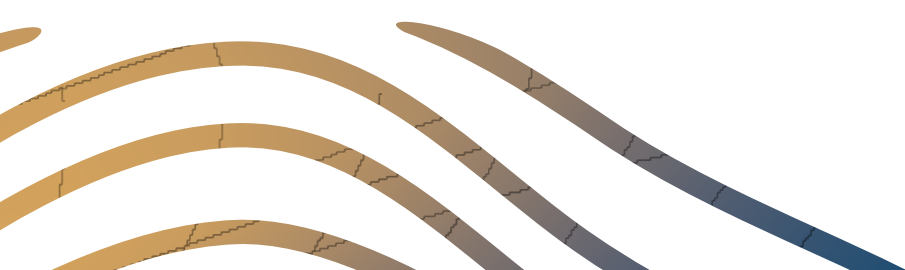




**THE OCEAN SENSES
ACTIVITIES BOOK**





SOUND



COLD SEEPS SYMPHONY

Focus:

To listen to the Arctic Ocean's sounds and to learn about the Arctic Ocean's biodiversity, particularly near cold seeps. We will experiment with creating new sound expressions inspired by the Ocean. For pupils with hearing impairment, pupils can create a bodily expression of this and/or use instruments they are comfortable with.

Learning objectives:

With this activity pupils will start to understand:

- the multitude of sounds audible in the Ocean and near to cold seeps at the sea-bed.
- That the oceans, including the Arctic Ocean, harbors great biodiversity.
- What an oceanographic ship is, and the anthropic sounds related to it.

Key words:

Ocean research, exploration, human/non-human relationship within ocean, sounds, place, noise.

This specific lesson plan was developed in a close collaboration with:

Lisa Katrin Losleben, Monica Clerici, Villads Dyrved Holm and Giuliana Panieri. All the sounds in the narrative (except the wave sound) were recorded on board the MS Kronprins Håkon in May 2022; The ship's horn was simulated with an instrument by Flavio Fulchi.

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IN SHORT (FOR THE TEACHER):

This is an activity in which pupils will construct their own instruments and use them to mimic the sounds they hear in the accompanying sound and narrative recordings from the Arctic Ocean.

The aim is for the pupils to better understand ocean research, but also human and non-human sounds and relationships within the ocean. Through the discussion afterwards, you should focus on what the pupils feel when hearing (and recreating) the sounds from the bottom of the Arctic Ocean. They can also discuss the importance of preserving the biodiversity we find there.

Materials:

For teachers:

- Background Information about fauna on the sea floor and near cold seeps (<https://akma-project.com> or find on <https://en.uit.no/project/akma> from summer 2023)
- The sound file of the narrative to accompany the activity (see accompanying sound file).
- Instructions on how to build the recycled instruments that the pupils will play as they follow the sound file of the narrative.

For pupils (SEE PAGES 5-7):

- Instructions on how to build recycled instruments able to follow the narrative. For the instruments, you will need the following (exact quantities depend on the number of children in the class):
 - Shaker/wave sound: cardboard cylinder, rice, plastic, or aluminium cover.
 - Empty water bottle/ship's signal horn: empty glass water bottle or a metal flask.
 - Castanets/clicking signals: cardboard, metal bottle caps.
 - In general, for building and decor: glue, tape, scissors, paint, pencils, and brushes.

Teaching Time (estimated):

60 min. Instrument building, although more time can be spent drawing, designing, and decorating the instruments.

60 min. Listening and playing instruments + discussion with the teacher.

Class organization:

The class should be split into 3 groups corresponding to the three different instruments. The teacher can decide how to arrange the activity if other instruments or modes of expression are included in the activity.

BACKGROUND STORY:

The Arctic Ocean is among the most remote and least known environments on our planet, yet. Like most environments, the Arctic Ocean is already threatened by human activities, such as litter deposition, increased CO2 emissions, and noise pollution from marine traffic and natural resource exploitation. Through sound and music, we can develop a closer connection to and greater respect for these oceanic environments.

A vast variety of species live in and around the Arctic Ocean. Seabirds and marine mammals like polar bears, seals and whales are usually the first that come to mind. However, under the surface of this magnificent ocean, we find the homes of thousands of different species. Also, the seafloor is chemically active, and we find methane bubbling up in the Arctic Ocean (cold seeps). Bacteria that can process methane and related substances, allow the formation of carbonate crusts. These solid structures also support great biodiversity.

Learning procedure:

The sound file provided with this activity is a soundscape that was created on the actual AKMA scientific expedition through the Arctic Ocean in May 2022. Your pupils will first get the opportunity to construct self-made instruments. These instruments can mimic sounds in the soundscape.

You will first divide the class into different groups. In each group, each participant will create a certain type of instrument, although pupils can also work in pairs. You can print out the instructions on the following pages to help the pupils through the process. You, the teacher, will guide the pupils in building the instruments while giving them information about what sound they will mimic. Or ask them what sounds they think their instrument will make. And get them to think about what sounds like their instruments in nature and the ocean.

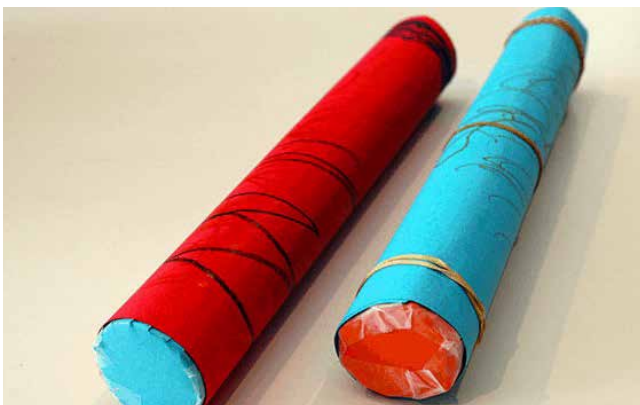
Once the instruments are complete, you can play the sound- file/soundscape. you can choose whether to read the narrative themselves (script starts on page 8) or to use the soundtrack with the narrative already incorporated. The script is a guide highlighting when the pupils should play their instruments.

Once the “symphony” is over, you and your pupils can discuss what they experienced, their emotions and what they understood from the soundscape. The main topic discussed should be the importance of understanding and preserving this biodiversity, and how sounds can be heard even at the bottom of the Arctic Ocean.

Use the following questions to structure the classroom discussion afterwards

- How can you hear when you are below water?
- Do you think that animals can hear the same as us?
- How do you think scientists' study what's on the seafloor?
- How is it possible to record sounds under the sea?

Instrument 1: SHAKER/WAVE SOUNDS MATERIALS:



Example of cardboard cylinders (e.g., empty chips can)

- Cardboard cylinder (e.g., empty chips can)
- Plastic lid or baking paper and an elastic to close the end of the tube
- Rice or beans
- Paint, brushes, pencils, glue, and marine themed decors

Building the instrument:

- Take an empty Pringles container, or a cardboard cylinder, and cover the outer surface with paper or masking tape. On this, you can paint or draw ocean motifs. You can also attach marine themed decorations;
- Insert a handful of rice or dried beans into the container, and seal it;
- Ensure the cap fits tightly and securely. If not, you can substitute the lid with some baking paper attached to the top with an elastic band and/or tape;
- Different beans, rice, and pulses make different sounds, so experiment with different contents!

Instrument 2:

EMPTY WATER BOTTLE/SHIP'S SIGNAL HORN MATERIALS:

- Empty glass water bottle or flask. NB: Make sure the opening at the top is not too big so that it makes a sound when you blow across the top. Bottles with larger openings can be gently hit with a piece of foam to make a sound.
- Glass paints,
- Paint brushes,
- Pen (permanent markers to draw on the glass bottle),
- Glue, and
- Marine themed decors to decorate your bottle.
- Water to fill your bottle to various levels.
- Pieces of foam to gently hit the top of the bottle if necessary.



A child holding an empty transparent bottle

Building the instrument:

- Decorate your bottle with paint and marine themed decorations;
- Depending on how full the bottle is, the instrument will play a different sound, when you blow across the opening, or gently hit the top with a piece of foam;
- You can leave the bottle empty for a very deep and strong sound, or you can experiment with different water levels in your bottle to make a different pitch.

Instrument 3:

CASTANETS/CLICKING SOUNDS MATERIALS:

For each castanet, you will need:

- Cardboard to cut into a strip the width of a bottle top.
- 2 metal bottle tops. These need to be slightly flattened so they stick to the cardboard (see the image below). Ask your teacher if you are allowed to flatten them yourselves.
- Glue
- Paint, brushes, pencils and marine themed decors to decorate the castanet.

Building the instrument:

- Cut out a rectangular piece of cardboard as wide as the bottle tops and long enough to be folded in two like a duck's beak;
- Stick two bottle tops at the end of "beak" with the glue, so that they hit each other when the cardboard is squeezed;
- Decorate the castanets with paint, pencils, and marine themed elements!



Example of castanets madewith bottle tops and cardboard

FOR THE TEACHER:

It's up to you, the teacher, to choose either the soundtrack/ soundscape with an already integrated voiceover of the narrative, or to read the narrative yourself. Either way, we suggest that you previously listen to the soundtrack in its entirety to have a better picture of the task for the pupils.

The following narrative also indicates when the pupils can/should play their instruments. Feel free to add musical intervention from pupils at other times too.

THE NARRATIVE (SPOKEN WORDS IN THE SOUND FILE):

As you see the Ocean from above, what you may perceive is a vast blue spot covered in waves. But is it really only that? Come with us on a journey to discover the beauty of one of the most alien elements on our planet.

We start our adventure leaving the seashore of Longyearbyen, from the Svalbard archipelago, the last human-populated frontier before the north pole. The ship we are onboard now is an oceanographic ship, fundamental transportation for marine scientists. The ship is filled with advanced instruments capable of doing unimaginable things, and to take us on an adventure. What you can hear is the sound of waves gently breaking on the shore (PUPILS MAY USE INSTRUMENT 1). Once left behind us the snowy coasts of Svalbard we rapidly take the open sea in search of the wonders of the marine environment.

Can you hear it? (PUPILS MAY USE INSTRUMENT 1 and 2) the sound of the waves still keeps us company, but something more is coming... (PUPILS MAY USE INSTRUMENT 2) We are welcoming ourselves into this blue blanket that is going to carry us for the next days.

Reference:

<https://zinginstruments.com/homemade-musical-instruments>

We let the sound of the ship prevail in our sleep while we are rocked by the waves (PUPILS MAY USE INSTRUMENT 1). But in the middle of the night something strange happens, (PUPILS MAY USE INSTRUMENT 1 MORE VIGOROUSLY) you hear an increasing crackling sound... something strange that you've never listened before. We jump down the bed and run to the porthole of our cabin, look! Ice! We are surrounded by a breath-taking white expanse of snow and ice! You can hear the boat crackling, scratching, and cutting through meter-thick, teal ice floes.

Once we reach a solid spot, we decide to explore more the unknown corners of this incredible environment. We can hear our footsteps get caught in the snow, the iced wind blowing through our ears and something else... an incredible whiteness all around us. You may think that this place resembles some iced planet lost in an unknown galaxy. But in reality, it has had its hands in life much more than you might think...

We deploy our hydrophone, an instrument marine scientists use to record sounds meandering from the ocean. While the microphone enters the water you can start hearing the muffled sounds of the ship and our voices getting more and more distant. And suddenly (PUPILS MAY USE INSTRUMENT 2 & 3) the magic happens, you hear whistling, giggling, and clicking cetacean sounds. These could be dolphins, whales, belugas and much more!
What a wonderful surprise!

While we continue our journey into the heart of the abyss, the environment becomes darker and darker until no glimpse of the light can be found. But this darkness isn't scary or intimidating, because if you can listen closely, you get more familiar with the sounds meter after meter (PUPILS MAY USE INSTRUMENTS 1, 2 & 3). We might even encounter the sound of popping bubbles from methane sources. Bacteria that can process this substance allow the formation of carbonate crusts, a hard surface that allows the presence of a wonderful biodiversity: from tubeworms, snails, microbes, shrimp that rely on processes able to transform these substances in nutrients for themselves instead of using the sun. Anemones whose tentacles vibrate in water streams, starfishes that follow the same flow, and octopuses that want to participate in this joyful dance. You may also hear Skates gently caressing the seafloor and fishes darting in these magical waters. Can you imagine what this symphony of ocean life might sound like?

What a wonderful ride has been this concert of ocean sounds! We slowly come back to the surface more conscious of the beauty and biodiversity of the ocean, how something that was just a blanket has become a place of life, width and sounds? (FROM HERE THE TEACHER WILL OPEN THE DISCUSSION WITH THE PUPILS)