



SEQUENCE 1

Age group	6-9 y. o.
Prior knowledge	None
Material needed	Waves box, skewer sticks, playdough, duct tape, ruler (optional).
Subjects	Physics
Skills involved	How a wave spreads. Measuring. Fine motor skills.
Time to carry out the sequence	1.5 hour

Step 1: Introduction

Start the lesson by discussing the sea with your students. Ask them what they know about it. They will most likely have a lot of different ideas, as the topic is quite broad. Write down their answers on the board and try to group their answers in categories like vacation, life in the sea, properties of the sea (e.g. it's salty, large...) etc.

Step 2: Storytelling

Read the story about the monster wave to your students. Discuss what they heard and if they think such a thing is possible. Have they heard about a massive wave like that one before? Ask them what was the largest wave that they have seen before. Use the storytelling resources to create your model of a wave.



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Step 3: Discovering the content of the box

Give the students enough time to go over everything in the box. Ask them what they think they are going to do next. Do they see a connection between the content of the box and the sea?

Step 4: The waves

Go back to what is written on the board and ask the students if they see something that connects all the groups. Is there something that can fall into any category?

Depending on their previous answers, there can be multiple answers to this question, but try to steer them towards the waves. Waves are one of key properties of the sea, they are instrumental for a lot of species living in and around it, they can be used as a renewable energy source, and they are a lot of fun when on vacation.

But how are they formed? Get the students to hypothesise about that.

There are different causes of waves like wind, earthquakes, volcano eruptions, and ocean currents.

Step 5: Creating a wave

To see how a wave is formed do the “Create a wave” experiment, described in the “Creation of elements”.

Discuss the results with your class. Do they understand how waves are formed and how they spread?



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SEQUENCE 2

Age group	10 -12 y. o.
Prior knowledge	None
Material needed	Waves box, skewer sticks, playdough, duct tape, ruler (optional)
Subjects	Waves
Skills involved	Understanding how waves are formed and how they spread Fine motor skills Measuring
Time to carry out the sequence	1.5 hour

Step 1: Storytelling

Read the story about the monster wave to your students. Discuss what they heard and if they think such a thing is possible. Have they heard about a massive wave like that one before? Ask them what was the largest wave that they have seen before. Use the storytelling resources to create your model of a wave.

Step 2: Discovering the content of the box

Give the students enough time to go over everything in the box. Ask them what they think they are going to do next.

Step 3: Creating a wave

Do the "Create a wave" experiment by following the instructions in the "Creation of elements".

Discuss the results with your class. Have they observed something strange about the wave? Did they notice that each stick only moved up and down, and yet the wave was moving left to right? How is that possible?



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They will most likely realise that it is happening because of the tape that connects them, so when the stick moves it twists the tape, which moves the next stick.

But how does this relate to water?

Tell the students to visualise dropping a rock the into water. While its falling through the water, it is pushing it down, but also pushing some of it left and right. This creates a “hole” in the middle and a “hill” on each side. Then the water goes from the hills to fill the hole, but since its such a big difference too much water goes in the middle, so it becomes a hill, and the sides become holes. This is the basic principle of how waves spread throughout the water.

In physics these waves are called transverse waves.

Step 4: How are waves created

Clearly, the ocean waves that we are talking about can't be created by throwing a rock in the water, so how are they formed? Ask your students to write down what they think causes the waves. To make it more interactive you can use a digital tool like Mentimeter to collect their answers.

There are many different things that can cause waves, but the most common is the wind. Its speed, duration and direction influence the size and characteristics of the wave.

Waves can also be caused by seismic activity like earthquakes and volcano eruptions. These occurrences are much more powerful than casual winds, so they can create much bigger and more destructive waves called tsunamis.

Another specific type of wave is the tide. It is an everyday sea phenomenon, and it refers to the rising and falling of the sea, which usually happens twice a day. What makes these so unique is that they are caused by the gravitational pull of the moon.



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Step 5: Why are ocean waves important?

Ask your students about their thoughts on the importance of waves. Are they useful at all, and do they have any sort of an impact on the world?

The waves are really important for our world, and they impact different aspects of nature. They help redistribute heat from the equator towards the poles, influencing global climate patterns. They are also important for different species because they bring nutrients to the surface, supporting marine life and contributing to the coastal ecosystems. The massive energy that the waves have can be used by special power plants, as a renewable source used to generate electricity. And lastly, and possibly the most importantly for the students, the waves are a source of great fun when you are at the coastline.



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