

ACTIVITY DOSE PROJECT '22 –

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Title Activity	Help, we are drowning!
Age group	primary school (10-12 yo)
Number of hours	5 half days
Goals/skills summary (most obvious, related to context)	<p>(The pupils can ...)</p> <ul style="list-style-type: none">- make a floating farm that is anchored to the seabed. They also have to think about the tides.- make a floating forest of fruit trees. These trees must be attached to each other so that the forest stays together. Anchoring must also be provided here.- The students can build a greenhouse above their floating farm. This greenhouse must also offer protection against salt water.- The children can look for a way to make sea water drinkable and ready for irrigation of their farm or a way to collect rainwater.
Brief description of the activity: (max 4 sentences)	
<p>We are building a floating farm with a forest so that we can provide food when there is not enough land. The farm and the forest must be anchored to the bottom of the ocean. They have take into account the tide. The forest may not drift apart. They also make sure that the farm can resist a storm at sea. So they provide enough stability. They also make sure that the farm is completely closed off. High waves cannot hit the farm and make the ground unusable. They also provide a way to have water on their farm. This can be done by collecting precipitation or by purifying seawater.</p>	

CONTEXT	
Motivation	<p>Global Warming has its consequences. Especially problematic is the rising of the water level of the oceans. So in the future there will be less land available and we will have to learn to live on water. We will also have to grow our vegetables on the water. But how do we do that? We build a prototype of a floating farm, that provides us with food supplies, when there is not enough land. The farm must be anchored to the bottom of the ocean. In doing so, pupils take into account the effect of the tide. Pupils also have to make sure that the farm can survive a storm at sea (stability issue). High waves may also not hit the farm and make it unusable. They also need to provide a way to have drinking water on their farm. (collecting precipitation or purifying seawater).</p>
Justification of STEAM integration (doctor)	<p>Science: Ebb and flow Water cycle Floating and sinking Stability Filtering water What do plants need to grow?</p> <p>Technology: How to build a green house? How do you make a water filter on a collection system? How to keep the farm floating and remain stable? How to anchor the farm?</p> <p>Engeneering: How to optimize design? Criteria of the design</p> <p>Arts: The farm must look as pleasant as possible. You have to spend a full life in it. (e.g. Graffiti on the walls, colours in the windows,....</p> <p>How to use graffiti? Lass Art?</p> <p>Maths: (specific) weight density Contents</p>

	Measurement
Methodology and materials needed	
Materials	<p>By class:</p> <p>Farmhouse:</p> <ul style="list-style-type: none"> ● Aluminium tray ● Plastic tray ● Shelves ● Cultivation earth ● Cardboard ● Wooden slats ● Straws ● Balloons ● Cork ● Styrofoam ● PMD bottles ● Rope ● Duct tape ● Glue gun ● Weight of 1 kg <p>Forest:</p> <ul style="list-style-type: none"> ● Plastic trees ● Small cups ● Styrofoam ● Shelves ● Cork ● Boulders ● Cultivation earth <p>Green house:</p> <ul style="list-style-type: none"> ● Plastic foil ● Prickers ● Skewers ● Steel wire ● Spaghetti sticks ● Spatulas ● Paint (glass paint) ● Glue gun ● Styrofoam

	<p>Collecting or purifying water:</p> <ul style="list-style-type: none"> ● Fire ● Salt (+water) ● Plastic pipes ● Cups ● Steel wire ● Piece of mirror ● Pieces of metal ● Glue gun ● Duct tape <p>Per group:</p> <p>All the materials are in the front of the classroom. The pupils take only what they need. They leave the rest.</p>
Organisation	<p>The pupils work together in groups of four.</p> <p>They all have a socket. So they can use the glue gun. The materials and tools are all together in the classroom. They can take what they need. It is not a good idea to stock up and then throw it away.</p>
<p>Coaching & methodology</p> <p>Based on learning by doing (with different levels: from imitation to creation)</p>	

<p>Questions:</p>	<p>Preface:</p> <p>Make a sketch of the farm. Make sure that the materials are recognisable on the sketch! You will need to do this at every step of the process.</p> <p>Phase 1: (the farm)</p> <p>Make a floating farm that is stable in the water and can carry a weight of at least 1 kg. Make sure that your construction cannot float away.</p> <p>How do you make sure the farm stays floating?</p> <p>Can the farm carry enough weight? How do you make sure the farm can carry a heavy weight?</p> <p>What materials do you use? Can they tolerate seawater? (Salt water is aggressive)</p> <p>How do you prevent the farm from capsizing?</p> <p>Can the farm carry enough weight? How do you make sure the farm can carry a heavy weight?</p>
<p>Questions:</p>	<p>Phase 2: (the forest)</p> <p>Make sure that a tree (standing upright) can float on water. The tree must not float away. The trees that are made must form one cluster.</p> <p>How do you keep the tree from falling in the water? (stability)</p> <p>How do you make the tree float?</p> <p>How do you make sure the tree stays in place?</p> <p>How can you make a sea forest out of individual trees?</p>
<p>Questions:</p>	<p>Phase 3: (green house)</p> <p>The farm needs to be protected from the sea water? You do this by making a greenhouse over it. Make a greenhouse so that the farm gets enough sunlight and make sure it doesn't get any salt water.</p> <p>What construction are you going to make?</p> <p>How to make it a solid construction?</p>

Questions:

Is the construction not too heavy? Make sure the farm doesn't sink.
What materials are you going to use?

Are the materials durable?

What kind of green houses do you know?

How can you make this green house beautiful so that it becomes more pleasant to live in?

Phase 4: (Collecting water to make it potable)

Our farm needs water for plants to grow. Seawater is not drinkable and the salt makes our soil infertile. We can use rainwater, but we must be able to collect it.

How will you ensure that our farm is supplied with water?

- Purifying sea water
- Collecting rainwater

Sea water:

Are there filters that can remove salt from the water?

How can we separate water from salt?

How is the salt we use in our meals made?

Rainwater:

How do you catch the rain?

How does the water in the reservoir get into the greenhouse or onto the plants?

Adaptations:

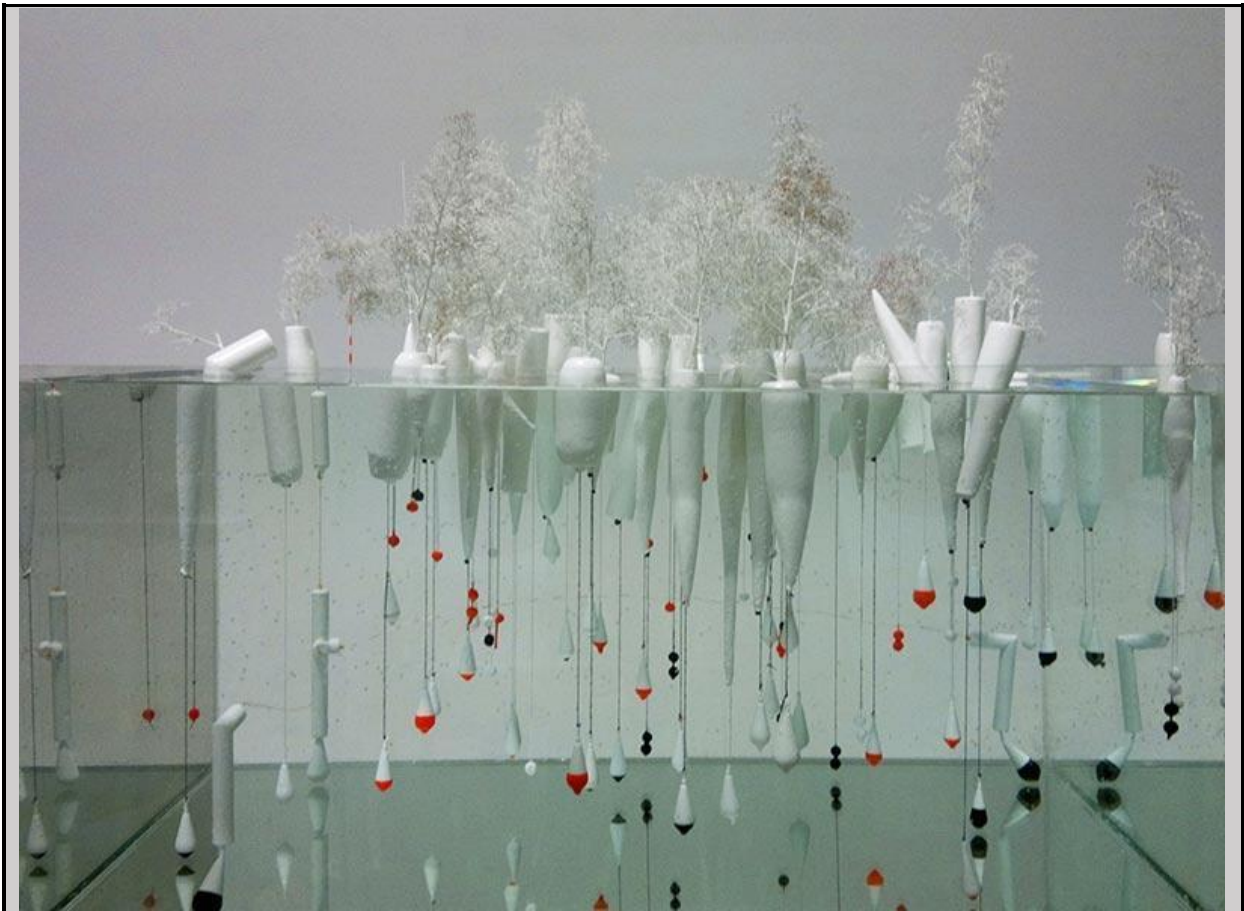
- Solar energy can also be used. Panels can be installed on the roof of the farm or they can also float.

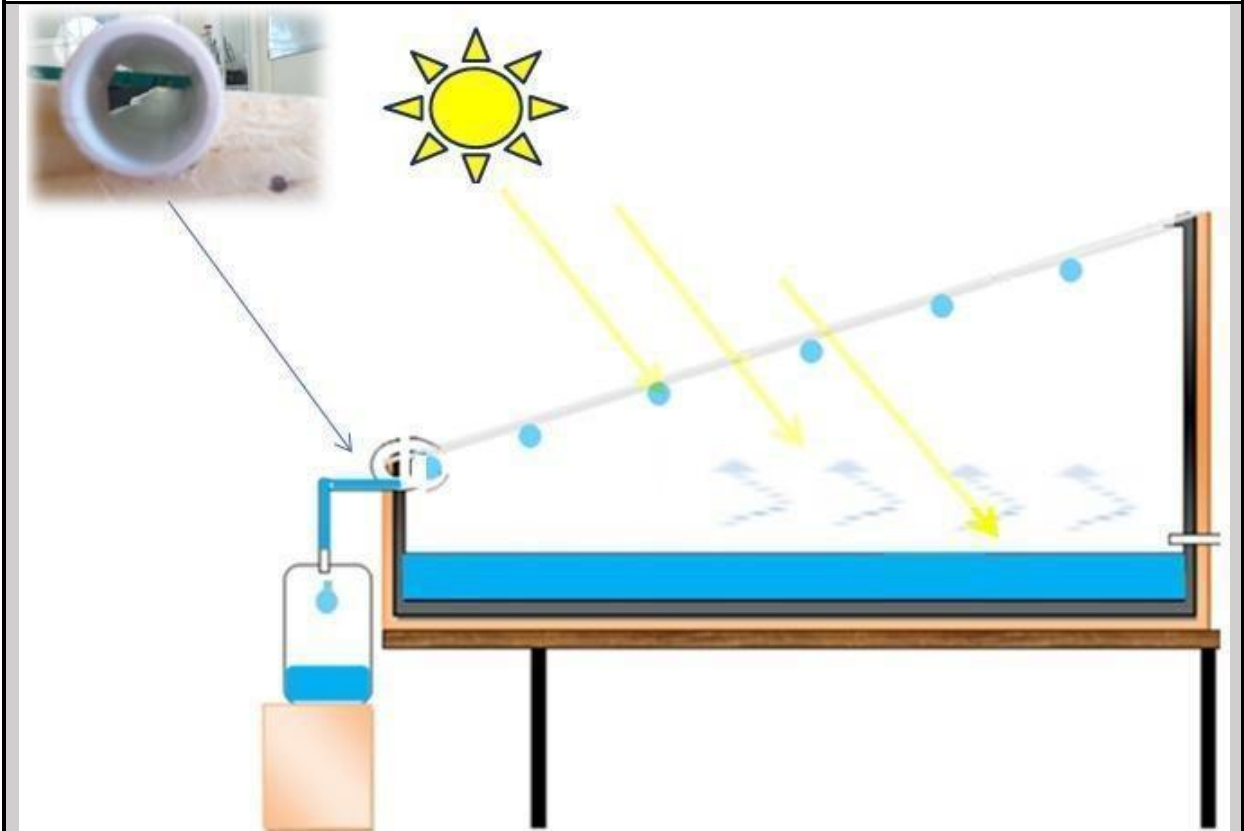
A windmill is also a possibility to install on the farm. Both can ensure that there is sufficient electricity on the farm.

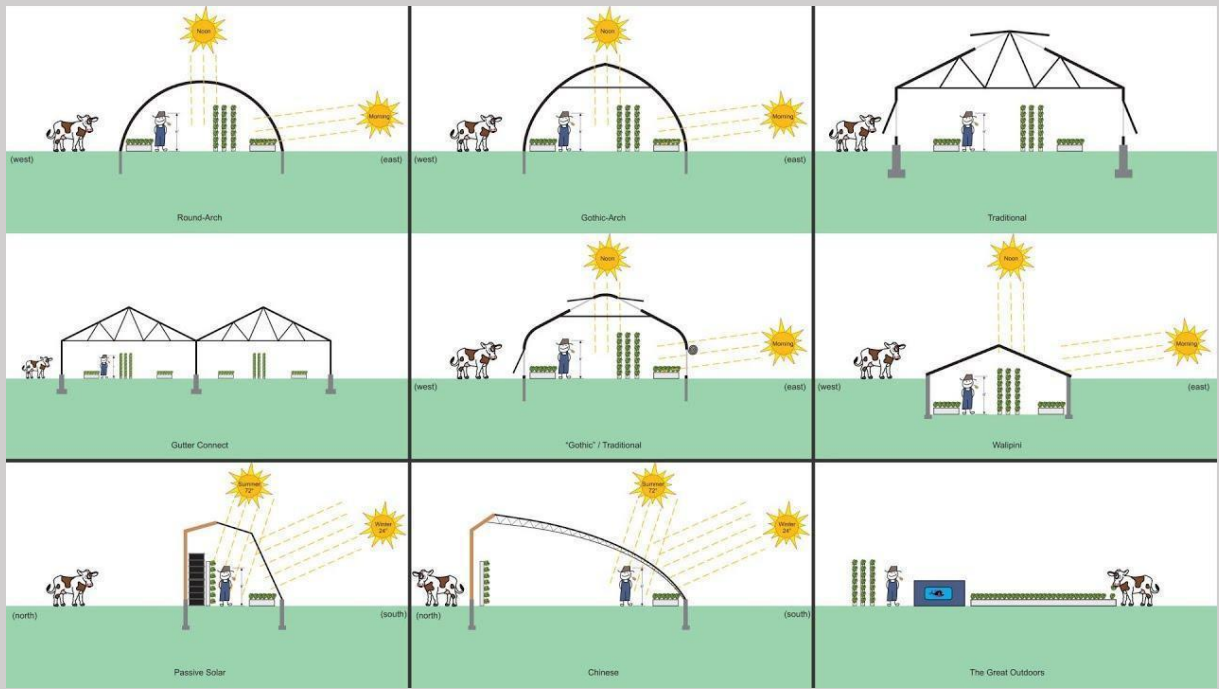
Tips & tricks











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