

Title of Lesson: Inventions based on Oceanic Animals

- I. Big Idea: The world we live on includes life on land and underwater. It is important to understand life under water to understand the relationship between all animals on this earth and how our actions can affect life in the ocean.
- II. Grade Level and Subject Area: 1<sup>st</sup> grade Marine Biology
- III. Standards:  
NGSS:  
1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.  
  
CCSS-Math:  
1.MD.C.4: Organize, represent, and interpret data with up to three categories; ask and answer questions about the total of data points, how many in each category, and how many more or less in one category than in another.  
  
Social Studies Standard: 1.1 Students describe the rights and individual responsibilities of citizenship.  
2. Understand the elements of fair play and good sportsmanship, respect for the rights and opinions of others, and respect for rules by which we live, including the meaning of the “Golden Rule.”
- IV. Justification Statement: This unit plan is based on NGSS and making connections between the world around the students and themselves and technology. This unit plan is designed to allow students to learn about animal features within the ocean while creating their own technology based on what they learn/observe. Oceanic animals are used for this activity due to an upcoming aquarium field trip.
- V. Measurable Objectives:
  - Students will make observations on oceanic animals and base their design on those observations.
  - Students will create new technology to solve a human problem
  - Students will create and participate in a classroom survey based on animals represented for observation.
  - Students will participate in fair play and will fulfill their assigned group jobs
- VI. Total Time: The whole unit will take 3 days. Each day will have a 45-minute lesson.
- VII. Social Skills and or Habits of Mind to Engage/Assess: Students will engage in social skills and habits of mind in the following ways:
  - Having group discussions to decide and draw inspiration from a specific oceanic animal
  - Decide as a group what new technology that they will create
  - Present their inventions to the whole class

- Be mindful of animal characteristics to help students make meaningful connections about caring for our earth and the animals that live here.

#### VIII. Level of Voice:

- During instruction students will be silent and raise their hands if they want to contribute to conversation.
- During observations and group work, students can converse, but must maintain a moderate level of voice.
- During presentations, students should be silent and respectful to presenters. Only presenters may speak at this time and questions will be taken after the presentation if students raise their hands quietly.

#### IX. 5-e Framework

Role Assignments: Beginning with the Checker all roles are assigned to the right (clockwise)

Materials Manager/ Encourager: This person will also be responsible for obtaining materials for the design portion of the lesson.

Checker/Timekeeper: This student is responsible for making sure the students are designing something on topic, including labels, and a description. They will use the following checklist during the assignment:

Checklist:

- Can be used by humans
- Is based on an animal. Which animal? \_\_\_\_\_
- Has labels
- Has a description
- Has detailed illustration

Recorder: This student writes the description for the design after discussing with the group.

Observer/Reporter: Students with this job will be in charge of monitoring if students are handling the materials correctly and sharing the materials with each other. These students will also fill out the group participation evaluation sheet.

Other: Presenter: This student is responsible for sharing their design with another group during presentations.

### **Day 1:**

Materials:

- Oceanic realia
- Document camera to project KWL chart and survey
- Paper
- Pencils

- Clip boards (optional)
- Bell for signaling changes

Engage: Students will be introduced to the concept of animals having different qualities that help them protect themselves. Students will be asked what protection means. Have students have a discussion about how we protect ourselves versus why an oceanic animal would protect themselves. Start a KWL chart (completing K and W) about animals and protection. Preview to students that they will explore different things that protect animals in stations and to think about it could be used for human protection. Go over jobs and expectations for rotations.

Explore: Students will rotate between 4 stations that are set up to show examples of how animals protect themselves. The stations will be categorized by:

- turtles
- shells from clams, oysters, and mussels
- shells from snails, slugs, and limpets
- sea stars

Each station will have realia as well as books and photographs that give more information about the animals. Diagrams will also be provided. Have each rotation last about 4-5 mins.

Explain: Students will choose an animal that they wish to draw inspiration from and write an explanation on what the animal is, what characteristics it possesses, and which characteristic that they will choose and why. The recorder will write this explanation during this time with the help of his/her group.

Extend/Elaborate: Students will create and participate in a class survey about how many groups chose what animal. Example survey below:

Animal:	Number of groups who chose the animal:
Sea Urchin	
Starfish	
Hermit Crab	
Sea Snail	


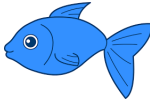


Fill out the final portion of the KWL chart.

Evaluate: The reporter will fill out the group assessment sheet. Each person will fill out a self-evaluation sheet.

Assessments:


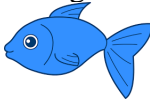


- Group Assessment:

Group Members:

	Not Quite 	Getting There 	Good Job 	Fantastic! 
Whole group stayed on task.				
Whole group worked together and was respectful to each other.				
Whole group handled materials respectfully.				

- Self-Assessment:

Name:

	Not Quite 	Getting There 	Good Job 	Fantastic! 
I helped the group with the design.				
I spoke to my group members using a 6-inch voice.				
I did my job to the best of my ability.				

## Day 2:

Materials:

- Paper
- Pencils
- Poster paper
- Markers
- Clipboards (optional)

Engage: Have students get in their groups and spread anywhere around the room so that they have enough space to work and aren't too close to another group. Have students review what animal they are using for inspiration and go over their explanation from day 1.

Explore: Have students design a human item inspired by the animal of their choice. During this time students must work together to agree on a design. Students can revisit the observation tables to get ideas and to help with their explanation. Students will draw their design and label it on a piece of printer paper. The checker can use the checklist throughout this part of the lesson.

Explain: Students will explain their design and how it relates to the animal that they chose. The reporter will also write during this portion and can get support from the group. This explanation will help with the group's presentation.


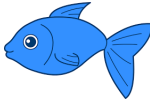


Extend/Explore: Students will create a poster to help them present their inventions to the whole class on the following day.

Evaluate: The reporter will fill out the group assessment sheet. Each person will fill out a self-evaluation sheet.

Assessments:

- Group Assessment:


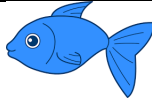


Group Members:

	Not Quite 	Getting There 	Good Job 	Fantastic! 
Whole group stayed on task.				
Whole group worked together and was respectful to each other.				
Whole group handled materials respectfully.				

- Self-Assessment:

Name:

	Not Quite	Getting There	Good Job	Fantastic!
--	-----------	---------------	----------	------------

				
I helped the group with the design.				
I spoke to my group members using a 6-inch voice.				
I did my job to the best of my ability.				

### Day 3:

#### Materials:

- Document camera to display survey
- Paper to create survey

**Engage:** Start the lesson by showing the class the survey that they made on the first day of the project. Have students keep this survey in mind when watching presentations so that they can anticipate what the inventions might be.

**Explore:** Have groups present their inventions to the whole class. Students are able to experience different inventions while listening to presentations as well as how their invention is similar or different to others.

**Explain:** Have students explain what invention from another group that they enjoyed. This can be done in a group discussion. Have students elaborate on why they enjoyed the invention.

**Extend/Elaborate:** Have students create another survey to see how many groups chose to make inventions based on protection, aid in eating, or how to move better. Conduct the classroom survey.

**Evaluate:** The reporter will fill out the group assessment sheet. Each person will fill out a self-evaluation sheet.

#### Formal Assessment (For teacher):

1: Below Grade Level	2: Approaching Grade Level	3: On Grade Level	4: Above Grade Level
Design is not based on an oceanic animal	Design has some resemblance to an oceanic animal	Design resembles an oceanic animal	Design resembles more than one oceanic animal or

			shows a deeper understanding of the properties of the oceanic animal.
Description of design is missing	Description of design is vague. Has less than 2 details.	Description has 2 to 3 details.	Description has more than 3 details or elaborates on the 2-3 details at above a first-grade level.
Design illustration is missing	Design illustration has no labels or is not detailed or both.	Design illustration has appropriate labels and details.	Design illustration is detailed with detailed labels.