

LESSON PLAN: OCEAN FRIENDLY STUDENTS

Subject: ADST	Grade: 1-5	Duration: 1-4 periods
Lesson Overview	Culmination of students' learning experience and connection to Surfrider's work, students will think of ways to make their own school more sustainable. This will be inquiry / project based learning. Students will use the applied design cycle to think of ideas and execute them.	

Curriculum Ties (in addition to satisfying multiple core competencies)	<p>Main Core Competency Being Addressed</p>  <p>ADST</p> <p>Applied Design</p> <p>Understanding context</p> <ul style="list-style-type: none"> ● Gather information about or from potential <u>users</u> <p>Defining</p> <ul style="list-style-type: none"> ● Choose a design opportunity ● Identify key features or user requirements ● Identify the main objective for the design and any <u>constraints</u> <p>Ideating</p> <ul style="list-style-type: none"> ● Generate potential ideas and add to others' ideas ● Screen ideas against the objective and constraints
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- Choose an idea to pursue

Prototyping

- Outline a general plan, identifying tools and materials
- Construct a first version of the product, making changes to tools, materials, and procedures as needed
- Record iterations of prototyping

Testing

- Test the product
- Gather peer feedback and inspiration
- Make changes and test again, repeating until satisfied with the product

Making

- Construct the final product, incorporating planned changes

Sharing

- Decide on how and with whom to share their product
- Demonstrate their product and describe their process
- Determine whether their product meets the objective and contributes to the individual, family, community, and/or environment
- Reflect on their design thinking and processes, and their ability to work effectively both as individuals and collaboratively in a group, including their ability to share and maintain a co-operative work space
- Identify new design issues

Applied Skills

Use materials, tools, and technologies in a safe manner, and with an awareness of the safety of others, in both physical and digital environments

Identify the skills required for a task and develop those skills as needed

Content Objectives	<ul style="list-style-type: none"> • Students will reflect on what they have learned in the program up to date and think of ways that they could make their school more sustainable. • Use the Applied Design Skills to solve a real world problem.
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Materials and Equipment Needed for this Lesson	
<ul style="list-style-type: none"> • Ocean Friendly Student Certificates • Any materials that students need to complete their projects. 	

Lesson Stages	Learning Activities
Introduction	<ul style="list-style-type: none"> • Begin by doing a review of some of the things we have learned up to date. • Now introduce the problem: How can we make our school more sustainable? Or plastic friendly? • You can begin this activity by having students go do “field research”. Allow time to do a walk around the inside / outside of the school. What things do they notice? What things are not very environmentally friendly? What are some things that could use improving? • Students can also interview teachers and other students. <p>Note: You may also need to have a mini-lesson on what sustainability is.</p>
Activity	<ul style="list-style-type: none"> • Run students through the applied design cycle for this challenge: <p>Understanding Context</p> <p>Understand the question: How can you make your school more sustainable? Discuss what sustainability is and do some “field research” around the school and the “potential clients”</p> <p>Defining</p> <p>Students can now begin to chose a specific topic or design opportunity. They can</p>

	<p>start to identify the main objective with what they want to do and any constraints they will face. At this stage they can also do some research to learn more about their topics. Maybe they want to create a compost system at their school. They can research how compost works and how other schools have done it.</p> <p>Ideating</p> <p>Begin brainstorming ideas! This could be a blueprint, or point form notes. Does it answer the original question / problem ? What are the constraints? This is a good time for a teacher check-in and see if students are on the right track.</p> <p>Prototyping</p> <p>At this point students can outline a general plan and create a first version of the product. If there is no physical product that they are creating (ex: a plastic free lunch program) they can create the plan for it. How will they execute it? What will be the incentive of the program etc.</p> <p>Testing</p> <p>Students can test their product / program.</p> <p>Making</p> <p>After running tests, students can construct the final product or plan. With the changes necessary from their tests.</p>
<p>Closure</p>	<p>Sharing</p> <p>For the final stage have students share with the class what they made / created, and how it will help the school! Try to have them keep in mind the original question, and focus on sharing the “why is it important” for our school aspect.</p> <p>You can do this in a Dragon’s Den style! Where they have to give a pitch as to why their product / idea should be funded!</p> <p>FINAL CLASS DISCUSSION: Ask students what they have learned from this experience? What plastic are they each going to eliminate and reduce from their</p>



	lives? What does your school need to do to become Ocean Friendly?
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Modifications	<ul style="list-style-type: none">You can add additional lesson plans to this project by doing lessons on natural resources as well to add in some social studies curriculum. <p>Another really great Engineering Design Challenge here is to have students create a device that can help clean up plastic in the ocean. Have them run through the stages in the Applied Design section of the ADST curriculum to ideate, plan, create and test a prototype of something that can clean the plastic from the rubbermaid bin from the previous science experiment activity.</p>
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Additional Teacher Resources	See the Engineering Design Challenge Worksheet section from the workbook for this activity.
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