

Development

Get Ready!	Lesson Title:	Inventing Like Cousteau: A Two-Week Challenge to Save Our Seas
	Format	mixed ability small groups of 3-4 students and independent work
	Major Concept(s) or Theme(s)	In this lesson, students will review <i>The Fantastic Undersea Life of Jacques Cousteau</i> by Dan Yaccarino and demonstrate their understanding of key ideas found in the text by creating a prototype for an invention that addresses ocean conservation issues. Students will be challenged to use their critical thinking and problem-solving skills to develop a deeper understanding of the academic content and apply their research to a real-world solution. Students will investigate a real-world issue and brainstorm within their small groups to identify a solution to complex problems, gaining learning experiences that can be applied to real-world problems. Furthermore, students will further their comprehension by thinking beyond just the text and describing how Jacques Cousteau's inventions and research protect our seas from pollution. Through this lesson, students will learn how people in the past influenced the development of technology and research today and how they, too, can make a meaningful difference in the world today.
	Objectives	By the end of this lesson, students will analyze key concepts from <i>The Fantastic Undersea Life of Jacques Cousteau</i> and collaborate in small groups to develop a solution to a real-world ocean conservation issue. By the end of this lesson, students will design and evaluate a functional prototype addressing a specific ocean conservation challenge, demonstrating their understanding of environmental issues and applying problem-solving skills in a collaborative setting. Objective for the presentation: By the end of this lesson, students will present their prototypes and articulate how their invention contributes to ocean conservation, utilizing multimedia tools to enhance their communication. Objective for the reflection: By the end of this lesson, students will reflect on their learning process and evaluate their group collaboration and personal contributions to the project through written, oral, or digital formats.

	Aligned Standards	Reading, Writing, and Communicating - Third Grade Standard 1. Oral Expression and Listening. 1. Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective (Colorado Department of Education, 2020). Reading, Writing, and Communicating - Third Grade Standard 4. Research Inquiry and Design. 10. Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions (Colorado Department of Education, 2020). Social Studies - Third Grade Standard 1. History 2. Analyze historical time periods and patterns of continuity and change, through multiple perspectives, within and among cultures and societies (Colorado Department of Education, 2020). Science - Third Grade Standard 2. Life Science 7. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how genetic and environmental factors influence variation of organisms across generations (Colorado Department of Education, 2020).
	Lingo (5-10 key vocab words)	- Conservation - Ocean conservation - Research - Solution - Prototype - Invention - Jacques Cousteau
	Materials or technology needs	- Book: <i>The Fantastic Undersea Life of Jacques Cousteau</i> by Dan Yaccarino - Technology: Laptops/Tablets, Internet access, Canva for multimedia creation (can choose another platform but must have permission first), Google Classroom or Microsoft Teams for collaboration - Project Kits: Craft supplies, models for physical components - Journal: For students to document their research, brainstorming, and design process

	Preparation	- This lesson is designed for a post-unit project after reading <i>The Fantastic Undersea Life of Jacques Cousteau</i> by Dan Yaccarino. - Students should already be familiar with the text and have a general understanding of what the book is about and the key ideas. - Teachers should prepare a classroom with space for students to move around and meet with their team members. - Teachers should have prepared mixed-ability groups of 3-4 before the start of the project. These groups should have all levels within in order to support all students in their learning needs. - Teachers should have the materials downloaded and ensure that students have access to laptops/tech platforms.
Engage	Objective: Hook: The purpose is to capture students' interest and connect the lesson to prior knowledge Optional video for hook and to refresh students' understanding of Jacques Cousteau: - YouTube video Underwater Discovery and Adventure: The Story of Jacques Cousteau - Video follow-up question: - Turn and talk with your partner: - Identify and discuss your favorite Jacques Cousteau invention that was mentioned in the video. - Bonus Question: Name one thing about Jacques Cousteau that was not mentioned in the video. Notice and Wonder - Show a picture of one of Jacques Cousteau's inventions (attached at the bottom of this doc). - Ask students to jot down in journals, "What do you notice? What do you wonder?" - give students 2 minutes to think about the picture - have students think-pair-share and talk about what they wrote in their journals (allow two minutes and have a couple of students share) - Sentence Stems: - I think this photo is.... - I notice that in the photo, there is.... - I wonder who is in the picture... - I wonder what this invention might be...	

	Discussion: Lead a class discussion on Cousteau’s impact and ask students what they think are current issues facing our oceans. - Class KWL chart on whiteboard - Ask students what they know, what they want to know, and later what they learned about ocean conservation. Driving Question: - Introduce the driving question: How can we create an invention inspired by Jacques Cousteau that helps solve current ocean conservation problems? - Teacher note: break down this question by highlighting different parts of the question like this: - How can we create an invention inspired by Jacques Cousteau that helps solve current ocean conservation problems? - Scaffolds the problem and helps students focus on two parts of the question Optional video for further information on Jacques Cousteau - E1 Sharks - The Undersea World Of Jacques Cousteau - 8 January 1968
Explore	1. Divide students into mixed-ability groups, and they will explore ocean conservation and current inventions and solutions to it. 2. Research: In small groups, students will conduct research on the selected ocean conservation issue a. Teacher Note: Give students examples of what to research: Plastic pollution, coral reef protection, metal straws instead of plastic straws, effects of oil spills in the ocean, etc. Write these topics on the board so students can refer back to them. b. Before research begins, have students choose their role in the project: i. Project Manager ii. Scribe iii. Researcher iv. Designer c. Provide resources for students, such as articles, videos, and websites tailored to students' reading levels. 3. Brainstorming: Students brainstorm potential inventions that could address their chosen issue, drawing inspiration from Cousteau’s work. a. Students document their research in a shared Google document that includes the team members and the teacher. b. Students are not required to provide citations but are expected to jot ideas in their own words. c. Students are expected to use three different sources with ten driving ideas and notes. These should be in complete sentences and can be

	questions. d. Blank document for brainstorming Jacques Cousteau 4. Initial Design: Groups begin to create a quick sketch or digital blueprint of their invention idea - Can use Canva and/or Canvas AI tool to help create their prototype - Students must show the teacher their prototypes before continuing the process. <i>Optional: Have students do a virtual field trip to the ocean to inspire their creations.</i> <i>Virtual Field Trip: Explore coral reef in the classroom virtual</i> - <i>Ask students to do a KWL chart with a partner</i> - <i>What do you know about the ocean?</i> - <i>What do you see?</i> - <i>How does this make you feel?</i> - <i>What have you learned, and how does this apply to your project?</i>
Explain	Teacher note: Teacher has students login to Google Classroom to locate the self-guided rubric. Teacher explains the rubric to the students and encourages students to refer to this rubric as the project continues. Remind students at the end of the unit, students will fill out their rubric assessing how well they think they did and the teacher will also assess them. Prototype development: - Students start to create their prototypes using their project kits and/or digital tools. - Students use their research and sketch ideas for their invention. They consider materials, functionality, and how their invention will solve their chosen solution. Students who are constructing their prototype through a technology platform like canva, will do the same. - Teacher should walk around making observations of how students are collaborating and engaging with the material. - Peer Review: - Mixed small groups/Round Robin - Students from each project group will meet with students from different project groups. - Each group will explain their problem, solution, and inspiration for the prototype. - Students form groups of 3-4 and take turns discussing and answering questions. - Have students share from each group about one of the projects they liked. - The teacher should be looking for keywords and phrases such as....

	1. Ocean conservation 2. Jacques Cousteau inspired this creation because... 3. The solution we came up with solves ____ issue. 4. Our prototype uses ____ technology platform. vi. Students then go back to their project groups and share feedback.
Elaborate	Expand and apply understanding through refining and improving their prototypes 1. Prototype Refinement: a. Based on peer feedback, groups refine their prototype and make adjustments to improve the functionality and effectiveness. 2. Preparation for Presentation a. Students prepare their final prototypes and develop presentations to explain their invention's purpose, how it works, and how it contributes to ocean conservation. b. Presentations are to be done using technology platforms such as Good Slideshow, Canva, or another document of their choosing. c. Students can present their information in whatever format they choose as long as it integrates technology. i. Students can create a collage, PowerPoint, podcast, video, etc.
Evaluate	Assess understanding and the effectiveness of the project. Innovation Fair Presentation: Groups present their final prototypes and presentations in an Innovation Fair. - Peers, teachers, and invited guests (Parents & guardians) are welcome to come! Final Reflection: - Students reflect discussing what they learned about ocean conservation, their invention process, and how they collaborated with others. - Students can represent their reflections in their journals, podcasts, interviews with teachers, and presentation videos. - Requirements: - Final presentation video: 2 minutes - Journal reflection: 2 pages - Podcast: 2 minutes - Interview with teacher: 2 minutes Assessment: - Students assess themselves using the student-led rubric to evaluate the final prototypes and presentations based on relevance to the conservation issue, creativity, and effectiveness.

	- Reflection journals are also turned in and assessed to gauge individual understanding and growth.	
Differentiate	Activities or extensions for students who are further ahead: - Students can do the virtual field trip and jot down what they observe and see. - Students can take a leadership role in the project group. - Students can explore more complex aspects of their chosen issue or to enhance their prototypes.	Activities or scaffolding for students requiring additional support: - I have included sentence stems for ELL students when they write about what they noticed or wondered. Additional support for ELLs can be provided by pairing students who are natural helpers, strong with English, and willing to help ELL students. - This lesson supports all learning styles with hands-on learning opportunities, visual and auditory. - This lesson is generally great for students with learning disabilities like ADD or ADHD because it requires movement, discussion, and lots of partner work. - small group work and partner work - additional scaffolding for students who need help with research or prototype development. - Throughout the two weeks, have groups rotate to the teacher's table so that the teacher can assist all students. - For student assessment, students have multiple options, such as reflecting in their journals, podcasts, presentations, or interviews with the teacher.
Other	Resources: Colorado Department of Education. (2020). 2020 Colorado Academic Standards Online. https://www.cde.state.co.us/apps/standards/7,5,0 Project materials: https://docs.google.com/document/d/1SK3YV_wb1bTPtjQ3EA1JoWMJ34JbjPH53edU6ipZwng/edit?usp=sharing	

	Student-Led rubric: https://docs.google.com/document/d/134X8rA4WxKsBNNbojErgLDmd6vMgJty-IMp-XGR1B_Q/edit?usp=sharing
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