

Introduction Lesson Plan #4
Man Overboard!
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JMU CTA Children's Engineering class for graduate credit
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TITLE/TYPE OF LESSON: The teacher-librarian will read Manfish: A Story of Jacques Cousteau by Jennifer Berne. Students will create a pop-up card to represent all eight ocean formations they have studied. Students will use 1 sheet cardstock, Index cards, aluminum foil, paper fasteners (brads), construction paper, tape, popsicle sticks, glue, yarn, limited recycled supplies, crayons/colored pencils/markers, hole punch, pens/pencils, a ruler, and scissors.

CONTEXT OF LESSON: Fifth graders study the ocean environment and eight ocean formations in science. Fifth graders also will begin selecting books and database articles on these individuals in the course of their curriculum. Therefore, these fifth graders can demonstrate their new knowledge by designing and creating an ocean pop-up card for display in the library. This displayed pop-up card will help other students understand the eight ocean formations. Adding the name of a nonfiction book on oceans to their pop-up card increases their ability to locate, evaluate and use information about the ocean.

In addition, fifth graders need to design and create based on their prior knowledge. This ocean pop-up card allows them to imagine a project that solves a problem and design solution. The book Manfish A Story of Jacques Cousteau is entertaining and developmentally appropriate as it ties in the biography of Jacques Cousteau to a project that students create. Students will feel accomplished as they create and design their own ocean pop-up for display in the library.

LEARNING OBJECTIVES:

- Critical thinking and problem solving through design and construction
- Recall the characteristics of the eight ocean formations including continental shelf, continental slope, continental rise, abyssal plain, oceanic trench, seamounts, mid-ocean ridge and coral polyps.
- Design three moving parts that demonstrate the characteristics of some of your ocean formations
- Use limited art and recycled materials to create a pop-up card that stands on its own
- Must be no larger than a standard letter-sized sheet of paper
- Must create a key or labels to identify all eight ocean formations
- A nonfiction book on the ocean is selected from the library's collection and drawn on the front of the card and includes the book's title, author and call number

MATERIALS NEEDED:

- Manfish A Story of Jacques Cousteau by Jennifer Berne
- 1 sheet cardstock
- index cards

- aluminum foil
- paper fasteners (brads)
- construction paper
- tape
- popsicle sticks
- glue
- yarn
- limited recycled supplies
- crayons/colored pencils/markers
- hole punch
- pens/pencils
- ruler
- scissors

TIMEFRAME: 1 hour 30 minutes

15 minutes read aloud Manfish A Story of Jacques Cousteau

10 minutes model making card/show rubric/portfolio (1 per student)

20 minutes sketch ideas/check out books

5 minutes to pass out sketches

5 minutes to review how-to of card and equipment safety

20 minutes of project time

15 minutes to check out books

STRATEGIES/ACTIVITIES: read aloud of Manfish A Story of Jacques Cousteau, activate prior knowledge about oceans, model card making/rubric/portfolio, brainstorm and sketch, how-to of equipment safety, model and facilitate selecting a nonfiction book about oceans for the pop-up card,

GROUP SIZE: individuals

SAFETY: review the how-to of scissor and hole puncher safety

VIRGINIA STANDARDS OF LEARNING:

Science 5.6 The student will investigate and understand characteristics of the ocean environment. Key concepts include

a) geological characteristics;

- b) physical characteristics; and
- c) ecological characteristics.

AMERICAN ASSOCIATION OF SCHOOL LIBRARIANS STANDARDS FOR THE 21ST CENTURY LEARNER:

- 1.1.2 Use prior and background knowledge as context for new learning.
- 1.1.4 Find, evaluate and select appropriate sources to answer questions.

STL:

8,9,10 design, invention and engineering

11 Students will develop the abilities to apply the design process

17 Students will develop an understanding of and be able to use information and communication technologies; g. letters, characters, icons, and signs are symbols that represent ideas, quantities, elements, and operations



Man Overboard! Design Brief by Michelle Hinkle

Background: You have already listened to Manfish: a Story of Jacques Cousteau by Jennifer Berne. Jacques Cousteau was a person whose life's mission was to explore and share the amazing underwater world. In addition, you have learned about many ocean formations such as continental shelf, continental slope, continental rise, abyssal plain, oceanic trench, seamounts, mid-ocean ridge and coral polyps. Scientists are learning more and more about these ocean trenches and formations because of submersibles and new technologies.

Design Challenge: Help Jacques tell the world about the wonders of the deep. You will have to design and create a pop-up card that shows all eight of the ocean formations you learned in science class this year. This pop-up card should have three pop-up interactive parts in it. Your pop-up card will help younger students learn about the ocean as it will be on display in the library.

Criteria: Your pop-up must

- Have at least three moving parts
- Be freestanding
- Include all eight ocean formations listed above
- Include clear labels or a key for clear identification
- Must be no larger than a standard letter-sized sheet of paper
- Have the title, author and call number of one nonfiction ocean book from your library drawn on the front of the card

Materials:

- 1 sheet cardstock
- Aluminum foil
- Construction paper
- Popsicle sticks
- Yarn
- Index cards
- Paper fasteners (brads)
- Tape
- Glue
- Limited recycled supplies

Tools:

- crayons/colored pencils/markers
- hole punch
- pens/pencils
- ruler
- scissors

1. STL 11 Students will develop the abilities to apply the design process
2. STL Standard 8,9,10 Elements of design, invention and engineering
3. STL 17 letters, characters, icons, and signs are symbols that represent ideas
4. SOL 5.6 ocean environment
5. AASL 1.1.2 Use prior and background knowledge as context for new learning.
6. AASL 1.1.4 Find, evaluate and select appropriate sources to answer questions.

Michelle Hinkle

Ocean Pop-Up Design
Brief

CTA STEM graduate
course July 2017

Man Overboard! Pop-up Card Portfolio Ms. Hinkle

Name: _____ Date: _____



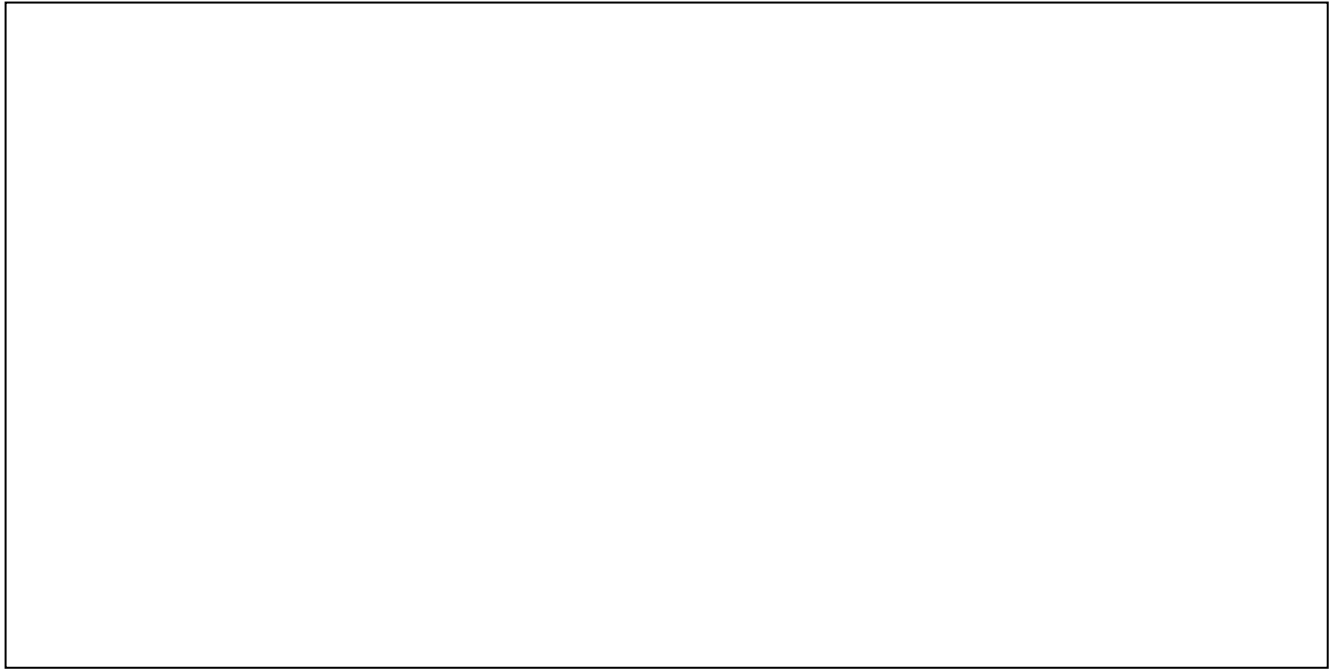
1. What is the problem?

Tell what the problem is in your own words.

2. Brainstorm solutions.

Sketch or describe some possible solutions.

3. Create the solution you think is best. Keep notes about your problems and how you solve them. Make a sketch if it helps.



4. Test your solution.

Does your pop-up card stand up on its own like a greeting card?

YES NO

Does your pop-up card have 3 moving parts?

YES NO

Describe the parts:

Does it contain at least 1 drawing of a nonfiction book about oceans from the library with its call number, title and author on the front of the card? YES NO

Write the book you chose here:

Does it have labels or a key for all eight ocean formations?

YES NO

Which formations did you include?

List them

here: _____

Is your pop-up card no larger than a standard letter-sized sheet of paper? YES NO

Does the card contain all eight ocean formations on it? YES NO

List two materials you used.

5. Evaluate your solution.

Was it the best solution? Would one of your other ideas have been better? Why or why not?

Could you add to your pop-up card to make it better? YES NO





Describe one thing you could do to improve the next pop-up card that you design.

Name: _____ Date: _____

Rubric for Mrs. Hinkle's Man Overboard! Ocean Pop-up

Cards _____

4=substantial understanding; 3=good understanding with room for improvement; 2=some understanding with room for improvement; 1=limited understanding

Criteria Assessed	Expert =4	Specialist =3	Apprentice =2	Newbie =1
Portfolio				
The student restated the challenge in his or her own words.	Used own words	Used some of own words and some of teacher's	Used mostly teacher's words	Used all of teacher's words
The student brainstormed more than one idea	Made four sketches of ideas	Made three sketches of ideas	Made two sketches of ideas	Made one sketch of an idea
The student kept notes and sketches while creating a solution to include problems and how they were solved	Kept notes and sketches and included a problem and its solution	Kept notes and included a problem and its solution	Kept sketches about a problem and its solution	Kept neither notes nor sketches about any problems
The student evaluated how he or she could make it better next time.	Wrote three sentences with details	Wrote two sentences with details	Wrote one sentence with details	Wrote zero sentences with details
Work and Social Skills				
Asked questions to solve any problems	Asked two questions for understanding or help	Asked one question for understanding or help	Attempted to ask questions for understanding or help	Asked no questions for better understanding
Demonstrated being a good	Demonstrated being a good	Demonstrated being a good	Demonstrated being a good	Didn't demonstrate

citizen by working well with other students	citizen	citizen some of the time.	citizen little of the time.	being a good citizen.
Demonstrated the ability to work independently	Demonstrated working independently	Demonstrated working independently some of the time	Demonstrated working independently little of the time	Didn't demonstrate working independently
Final Product				
Stands freely for more than 5 minutes	Stands for more than five minutes	Stands for exactly five minutes	Stands for one to five minutes	Doesn't stand at all
Has all eight ocean formations listed on the design brief	Has all eight formations	Has seven formations	Has six formations	Has five or fewer formations
Includes three movable parts	Includes three movable parts	Includes two movable parts	Includes one movable part	Includes no moving parts
Must have clear labels or a key for all eight formations	Has a key or labels for seven or more formations	Has a key or labels for six formations	Has a key or labels for five formations	Has a key or labels for four formations
Must be no larger than a standard letter-sized sheet	Is the correct size	Is not the correct size	Is not the correct size	Is not the correct size
Must have a nonfiction book about oceans from our library with title, author, and call number on the front of the card	Has a nonfiction book about oceans from our library on the front with its title, author, and call number	Has a nonfiction book about oceans from our library on the front with its title and author	Has a nonfiction book about oceans from our library on the front with the title	Has a nonfiction book about oceans not from our library on the front or no nonfiction book at all