

Destination 2018: Sustainability Lesson Plan

NAME: WILL WEISS

CAMPUS: WEST

DISCIPLINE: GEOLOGICAL SCIENCES

The goal of this lesson plan is to help you decide why and where you will infuse sustainability to improve student learning. Remember that sustainability is not an "add-on" content area; rather, sustainability can be integrated into already existing lessons as in-class examples of concepts and as a context for activities and problem sets that promote critical thinking.

Week 1: Needs Assessment

This week you will write a needs assessment for your lesson, learn about SDG goals, and identify 3 goals that could align with your course and topic.

Needs Assessment

1. Write your Needs Assessment:

(examples)

My students have trouble understanding how ocean currents work. They have trouble understanding why they are important to them. Also, how do ocean currents relate to sustainability and human conduct?

2. Explain why you think infusing sustainability will help this need:

(examples)

Infusing sustainability will show that what they do on land has an impact on the oceans. Changes in currents, garbage patches, food availability and distribution.

3. State where (course or area) you are infusing sustainability and the topic:

(examples)

I want to incorporate this into both earth science and oceanography. Currents are covered in both.

Research SDGs

Visit the [Sustainable Development Knowledge Platform](#) to research the Sustainable Development Goals.

4. Choose at least 3 of the SDGs of interest that could align with your topic and share why:

(examples)

Life below water: Garbage in the ocean has an impact on the creatures that live there. Currents will also impact on where the garbage is located.

Responsible consumption: By being more responsible with the materials we use, less will make it into the ocean.

Life on land: How humans behave on land as an impact on the water as well.

Week 1 Reflection

5. Now that you have completed this week's portion of the template, reflect on the following:

- a. I'm excited about... to learn more about how to integrate more aspects of sustainability in my classes. Excited about finding more opportunities for training on topic.
- b. I have questions about... how to use aspects of all three pillars of sustainability in a class that is heavy on the environment side.

Week 2: Learning Outcomes/Research

This week you will write the student learning outcome for your lesson, explore lesson plan examples, look at a variety of classroom assessment techniques, and consider how you could incorporate the 3 Pillars of sustainability with a learning activity.

Student Learning Outcome(s)

The Student Learning Outcome is a statement of what the student will learn or be able to do because of this lesson. For more information on how to write a measurable learning outcome, review the following resources:

[How to write a Student Learning Outcome \(Slides 1 to 5\)](#) | Bloom's Taxonomy Resources - [Bloom's Taxonomy Action Verbs](#), [Bloom's Interactive Graphic](#), [Bloom's Taxonomy of Learning Domains](#)

6. Write your Learning Outcome:

(examples)

Students will be able to analyze different ocean currents and how that relates to the formation of garbage patches.
Put your response here

Sustainability Lesson Plan Samples

Explore the following resources for lesson plan ideas:

- [Sustainability teaching activities across the disciplines](#) (Repository developed by Carleton College)
- Lesson plans organized according to conceptual Sustainability Systems: [Water](#), [Energy](#), [Food](#), [Waste](#), [Landscape & Ecosystem](#), [Supply Chain](#), and [Quality of Life](#) (Developed by ASU faculty)
- [AASHE Curriculum Resources Hub](#) (requires login)

7. Of the lesson plans you've explored, pick 3 and share why you selected those:
(*examples*)

Break the Cycle: Life of a plastic bottle. This also involves a taste test of tap vs bottle water. The activity will help to reinforce the sustainable practices in everyday life.

Compost in a bottle: reinforce sustainable thinking when it comes to food.

Estimating Arctic Sea Ice: This lesson will tie in several areas for earth science (glaciers and climate change). It will also help them to see the impact of climate change over time.

Put your response here

Classroom Assessment Techniques

Explore the following resource for Classroom Assessment Techniques:

- [101 Strategies to Demonstrate the Essential Competencies](#) – a college of classroom assessment techniques aligned to the essential competencies of a Valencia educator prepared by Valencia faculty Donna Colwell and Kevin Colwell
- [50 CATs by Angelo and Cross](#)
- [Classroom Assessment Techniques](#) by Northwest Evaluation Association

8. Of the CATs you've explored, pick 3 and share why you selected those:
(*examples*)

Debate: This can incorporate work for both intra and extraverts. Small groups can prepare for the debate. Groups can also evaluate each other on argument and participation.

Case study: Have students read a study related to topic at hand. Then respond to questions that evaluate higher level thinking on topic.

Real world problem: Students look at real world problem and think of solutions. Then review what professionals actually did.

Put your response here

3 Pillars Activity Idea

Review the 3 Pillars Worksheet.

9. Describe an activity that incorporates the 3 pillars:

(examples)

Have students research garbage patches in the ocean. Then come up with some different ideas on how to remove/reduce the size. Look at these methods through the lens of the 3 pillars not just feasibility on how to slow it down or collection methods.

Put your response here

Week 2 Reflection

10. Now that you have completed this week's portion of the template, reflect on the following:

- a. I'm excited about... looking at more lesson activities.
- b. I have questions about... resources for concepts on social and economic parts of 3 pillars.

Week 3: Putting it All Together

The goal for this week is to create an activity that incorporates the SDG, CAT, and connection to the 3 Pillars of sustainability.

SDG Selection

11. Choose the SDG that aligns best with your Needs Assessment/Student Learning outcome and explain why:

(examples)

Responsible consumption. This SDG will show the connection between ocean currents and garbage patches.

Put your response here

CAT Selection

12. Choose the CAT that aligns best with your Needs Assessment/Student Learning outcome and explain why:

(examples)

Real world problem. Students will look at the why the garbage patches came to be and who is responsible for most of its contents. Students will also be able to see what products they use every day that could be contributing to the patches.

Put your response here

3 Pillars Activity

13. Describe how you will incorporate the 3 Pillars into your activity:
[\(examples\)](#)

Students will split into small groups and be assigned on of the pillars to come up with ideas on how to reduce the size of the patches and reduce their growth. They will then do a think-pair-share to learn about what the other groups discussed.

Put your response here

Activity Draft

14. Create a draft of the activity using the SDG, CAT, and 3 Pillars:
[\(examples\)](#)

After looking at fundamentals of ocean currents (lecture/worksheets), the students will break up into small groups to investigate where the garbage comes (country and amount). They will also investigate what are the most common types of garbage found in the patches. Next, students will come up with ways to reduce the amount of garbage currently in the passages. The small groups will each be given one of the pillars to analyze the possible clean up methods.

Put your response here

15. Explain how the activity aligns with your Needs Assessment/Student Learning Outcome
[\(examples\)](#)

This activity will show students that ocean currents are important and need to be understood. This aligns with the learning outcome so they can see the connection between currents and the real world. It will give them a chance to investigate their creation and how it can be reversed.

Put your response here

Week 3 Reflection

16. Now that you have completed this week's portion of the template, reflect on the following:

- a. I'm excited about... learning more.
- b. I have questions about... ideas how to get students to deep think about social and economic pillars (my weakest).

Week 4: Lesson Plan Draft

This week you will finalize your activity and create directions for students.

17. Prepare a set of instructions on how to facilitate this activity.

(examples)

Answer the following questions:

What prior knowledge will students need to be successful with this activity?

They will need to know that garbage patches exist. If they had completed the homework and reading on ocean currents beforehand that would be a bonus.

What needs to be setup prior to delivering the lesson?

Arrange the classroom for small groups.

Put your response here

What resources and materials will you need?

Students will need access to the internet and paper + writing tool. One of the classrooms I teach in has access to laptops, otherwise let students know week before to bring something. Checking out a laptop cart would also be possible.

Put your response here

How do you plan to introduce the topic?

I would show them a video of a diver in the Caribbean trying to get into the water, but garbage is in the way.

Put your response here

How will you keep students engaged?

I will give them a time limit to complete certain tasks. If most of class is done early, we can move on or give groups a side task to keep engaged.

Put your response here

Step-by-step run of the activity

- 1) Show video of diver in garbage <https://www.youtube.com/watch?v=GSMGkwZBaWM>
- 2) Give students a few minutes to discuss and react.
- 3) Briefly explain what they are seeing (garbage patch) and that we are going to learn how they came to be
- 4) Have students look up what countries contribute the most garbage to the various patches
- 5) Have students look up what kinds of garbage are the most common
- 6) Through videos and pictures discuss that factories that create ocean currents ([Ocean Current PP](#))
- 7) Discuss how ocean currents are related to garbage patches
- 8) Have students come up with ideas on how to reduce or remove garbage from patches
- 9) In three groups (one for each pillar of sustainability), have students pick a few choices from step 8 that they think would work best and why
- 10) Have students complete a think-pair-share to discuss what each larger group came up with (one person from each pillar form a group of three)
- 11) Students will write a story from the perspective of a plastic bottle (starting in a randomly assigned country) and describe the bottles life from land to ocean. Story will also include a way for bottle to be removed from patch and reused, recycled, or other (favorite from step 8)

Now that you have addressed the questions above, include directions in the draft of your activity

Class, today we will be discussing garbage patches and how that relates to ocean currents. You now have permission to use your technology to answer some questions. As we move along today, I want you to think about your role in the formation of these various garbage patches and what changes you can make to help reduce to the amount that is getting there. Please write down your answers to the questions I ask as we go along, so I can give you credit for an in class activity.

At the end, you will write a short story pretending you are a plastic bottle. I will randomly assign you a starting point, and you will need to describe the journey you make to the appropriate garbage patch. Be sure to include how ocean currents played a role and the properties of these currents that permitted you to make your journey. Lastly, your story will end with you being recovered from the ocean by a method the class comes up with during our investigation. The directions will be in Canvas for you to look at.

Let's begin!

Put your response here

Week 4 Reflection

18. Now that you have completed this week's portion of the template, reflect on the following:

- a. I'm excited about... learning more
- b. I have questions about... how to imbed sustainability as theme in my classes.