

Destination 2018: Sustainability Lesson Plan

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CAMPUS: WEST CAMPUS – OSCEOLA CAMPUS

DISCIPLINE: GENERAL BIOLOGY – HUMAN BIOLOGY – ANATOMY AND PHYSIOLOGY 1

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:

[\(examples\)](#)

In Biology classes is very easy to connect the students with the concepts of sustainability starting from energy processes, chemistry, and when we talk about biological Systems. All these topics connect the students with the community they lived, but I think is important to work more for individualize topics to help them for thinking critically.

These activities address my personal concern about given the students elements to develop special capacity of thinking critically and, in second chance, improved the student learning capacities.

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

[\(examples\)](#)

I firmly believe sustainability as a topic for an case study in biology (biomimics) that will engage students in critical thinking, connect students to sustainability concerns, and help them finally to develop their ideas regarding global issues like Climate Crisis.

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

[\(examples\)](#)

BSC 1005 and the topic will be Climate Action, taking urgent action to tackle climate change and its impacts.

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: Students could understand how important is this resource, not just for all ecosystems, but also as a source of life.

***Climate Action:** Students understand through biology how life contains mechanism to produce sustainable energy for all forms of life, Clean energy happens inside every form of life, other solution for a better tomorrow.*

Good health and well-being: Students could understand more easily that healthy lives and well-being is essential for sustainability and development for everybody

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 know more about the pillars of the sustainability, the social aspect, the environmental aspect, and the economic one. I want to learn more about it.!!
- b. I don't have questions at this time. I want to continue the course and probably questions appear...!

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 Measurable Learning Outcomes](#) | 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)

The Student Learning Outcomes for my future lesson in Biology class should be:

- Students will apply the scientific methods through applications of sustainability in the real world.

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)

Put your response here

Unfortunately I cannot open the lessons plans developed by ASU faculty, and this limit my options.....

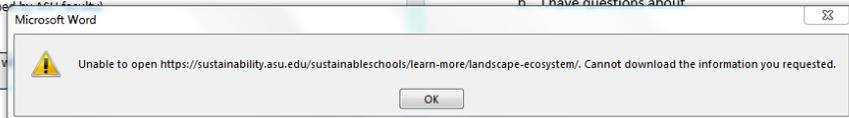
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7. Of the lesson plans you've explored, pick 3 and share why you selected those:
(examples)

Put your response here



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

a. I'm excited about...

b. I have questions about...

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

Debating Three Different Areas of Sustainability: the Environmental, Social and Economic Dimensions of the Triple Bottom Line is one of my pick. One of the reason is because help student with public speaking, writing, critical thinking, group communication, and the whole group compromise and teamworking. This assignment also helps make the students become aware of environmental, social and economic issues.

The Costs of Your Commute: Your Money, Your Time, and the Earth is another pick for me. Students need to investigate an alternative option for their commute that could be more environmentally friendly. Also serve as an introduction to thinking about personal impact on the environment while still appealing to personal costs.

Plastic Waste Production is a good one. Help students understand how big the problem is (e.g., how much plastic is going in to landfills, water or inside the animals we eat) and what potential solutions are.

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](#))

*CAT#1 : **Mini-Presentations**: When students prepare to “teach” something, the content takes on new meaning to them. They must clarify their own understanding before they can then act as instructional resources for others students. These presentations afford students the opportunity to own their learning and serve as a resource for their peers.*

*CAT#2: **Quick Case Study/Jigsaw**: In class teams of students are given different case studies on a concept or topic about sustainability; in their team, they read the case study, answer the questions, and briefly present the case to the class. Students are then quizzed on all of the presented case studies.*

*CAT#3: **Group Investigation***

Students demonstrate their ability to synthesize course content by creating a sustainability project that highlights the relationships between several economic, societal and environmental factors using primary and secondary sources. Students determine the format for presenting their project, which could be a film, slide show, website, etc.

3 Pillars Activity Idea

Review the 3 Pillars Worksheet.

9. Describe an activity that incorporates the 3 pillars:
([examples](#))

- *My goal is to reflect the solution or issue through the 3 pillars (Social, Economic, and Environmental) , and I want to create a forum in my course with a discussion for debating about the three different areas of the sustainability: The Environmental, Social and Economic Dimensions, based on the biomimicry. However, a step before the discussion for debating, I want to select 3 group of students, and I give them a topic about biomimicry, as a case study/jigsaw. And when each group is ready for the final report, I create a forum for the discussion*

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 start to connect my students with the Biomimicry (https://youtu.be/k_GFq12w5WU <https://youtu.be/n77BfxnVlyc>)
- b. I have questions about..... Not yet, sorry. Maybe I became your worst student in this course

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](#))

I decided to choose the #13 SDG: *Take urgent action to combat climate change and its impacts.*

Any of the SDGs could be the topic for jigsaw case and posterior discussion in the forum. Even tough Goal#13 is the widest

For example, Goal #13 *Take urgent action to combat climate change and its impacts using biomimicry look a good choice for taking urgent action to tackle climate change and its impacts. Climate change is caused by human activities and is threatening the way we live and the future of our planet. By addressing climate change, we can build a sustainable world for everyone. But we need to act now aims to ensure that people. Some action probably came out in the discussion. But the most important aspect will be that the students develop their personal stance on these issues. Some questions could be raised, Are people's lives really being affected by climate change?, What happens if we don't take action?, Can we solve this problem or is it too late to act?, How much would it cost to solve this problem?, and the most important : What can I do to help achieve this goal?*

CAT Selection

12. Choose the CAT that aligns best with your Needs Assessment/Student Learning outcome and explain why:
([examples](#))

The CAT that best aligns with my Needs Assessment and Student Learning Outcome is the Case Study/Jigsaw. Students are then split into 3 groups with one member assigned to each topic (Case study). Working individually, each student learns about his or her topic and presents it to their group. Next, students gather into groups divided by topic. Each member presents again to the topic group. In same-topic groups, students reconcile points of view and synthesize information. They create a final report. Finally, the original groups reconvene and listen to presentations from each member. The final presentations provide all group members with an understanding of their own material, as well as the findings that have emerged from topic-specific group discussion (biomimicry). Having students do this will be important because students should write in the discussion about the way their expert knowledge was changed or enhanced by listening to their peers.

3 Pillars Activity

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

- I will try to include the 3 Pillars in my activity by placing a problem at the end of the activity. To address this, the students need to apply the course content to a real-world situation and work toward a solution (case Study)

Activity Draft

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

Put your response here

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

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 how the sustainable lesson plan is coming out
- b. I have questions about... almost everything! More time I spent with this, more questions flow in my mind

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?

The concept of Biomimicry, some practical examples

What needs to be setup prior to delivering the lesson?

Some materials like videos about biomimicry

What resources and materials will you need?

A couple of videos about what is biomimicry, a computer, Wi-Fi access, paper, pencil, files to organize materials.

How do you plan to introduce the topic?

I plan to make a video introduction about biomimicry during the first classes, because at the beginning we discuss biological systems. I think is the correct moment to generate the analysis of a real case in biomimicry, discussing the impact on natural biological systems, and sustainability. After the video introduction, we can follow up with a discussion in class.

How will you keep students engaged?

Showing the video is a good start, control the progress

Step-by-step run of the activity :

- 1) Instructor shows a video on Biomimicry to the whole class
- 2) Instructor leads a discussion relating Biomimicry to Biology and sustainability
- 3) Students will be given a real world case study of biomimicry and divided into 7 groups of 3 consisting of 1 social, 1 economic, and 1 environmental perspective.
- 4) Students will then work to identify the issues from their perspective of sustainability (Social, Economic, Environmental).
- 5) Students will then come back to their groups to reconcile points of view and synthesize information and to propose solutions to the issues that are sustainable from the point of view from all pillars.
- 6) Each group will then share their proposed solution with the entire class.
- 7) Then students will have a whole class discussion reflecting on the proposed solutions they found.

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

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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 putting this into action!
- b. I have questions about what might be the best topic for case study to use, and are my students able to fully understand the implications of sustainability of the biological aspects of biomimicry.