



**MARINE BIOTECHNOLOGY & BIOINFORMATICS FOR TEACHERS
MOSS LANDING MARINE LABS NSF ITEST GRANT
TEACHER LESSON PLAN FOR CLASSROOM USE**

LIFE IN THE OCEAN

Title of Lesson: Life in the Ocean

Designed by:

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Background:

At the end of the lesson students will be able to understand what the life looks like in the ocean. It is the first lesson which I am going to introduce to my students before I introduce them to bioinformatics and biotechnology.

Description of Audience:

This biotechnology/bioinformatics activity is designed for use by students in middle and high school

State Standards:

CA standards: Grade 7: 5a and b
Grade 9-12: 9a, b, c, d, e, f, g, h, i

National Standards:

This biotechnology/bioinformatics activity fulfills the following National Science Standards:

- Content standard A: Science as inquiry
- Content standard C: Life Science
- Content standard E: Science and Technology

STEM Connection:

All Biotechnology and bioinformatics careers

Goals(s):

- Students will be interested in Oceanography
- Students will be interested in Marine careers
- Students will be interested in becoming marine environmentalists
- Students will be interested in Marine biology careers

Learning Objective(s):

Upon completion of this lesson, students will be able to (Include process skills but be specific. What will the STUDENTS be able to do/demonstrate as a result of this lesson?):

- Students will be able to identify lives in the ocean
- Students will be able to tell how the lives in the ocean get energy
- Students will be able to describe how the marine environment is divided
- Students will be able to classify some marine organisms

Purpose/Rationale:

- To introduce students to marine life
- The significance of this lesson is inspire students to engage in marine biology and bioinformatics careers
- Students are exposed to National and California standards

Materials/Resources:

In order to complete this lesson, the following materials are needed: PPT (Marine life), work sheet, students' journals, field trip to Tide pool and ocean
*power point:

Prior Teacher Preparation:

- Understand and investigate the marine environments prior to field trip.

3-Step Procedure:

#1 Introduction:

- Have you been to ocean before? Have you seen any life in the ocean? Can you identify any animals or plants in the ocean?
- What would you like to see if you go to a tide pool?
- Introduce the vocabulary using the PPT
- Students will make write what they know about marine life, draw them and write where the location is.
- They should be able to make hypothesis before they go on their trip to tide pool

#2 Exploration:

Students will make a trip to tide pool in the area and write the answers in their journal:

1. What animals or plants did you see during your trip to tide pool?
2. Can you draw and write their names?
3. Do they look alike?
4. Describe the parts you saw that are interested to you.
5. Why is it important to learn about marine environments?
6. Why do we see different animal and plants in different areas?

#3 Application:

- Students can apply their knowledge to their next lesson to dissect mussels? They will be able to know why is it important to human life? (Pollution, population and etc.)
- How can we identify different types in same species? (Introduce them to DNA extraction)

- Research activity: Students will conduct research and make a PowerPoint about the marine communities and why they are important to our lives. They will also be making a list of careers that they can go to, if they learn more about Marine life.
- Career Connection: This is the first step that they are taking towards their marine Biology careers. They will be able to do a web search to find what jobs are available if they pursue marine biology in college.

Assessment

- If the students are able to describe the marine environment, marine lives, and why are they learning about them to other groups in class using a power point or poster, I believe they learn fulfill the objectives of the lesson.
- Worksheet is attached to the document.
- The teacher can assess the students work after going through their worksheet and power point.
- The students who didn't get it can follow the power point presentation to identify their animals. They will be paired with another student who can identify marine life to get help.
- Talking about salinity and how marine life is affected by low and high salinity. Students can extract DNA from different species and find their DNA to match similar species.

Teachers' Self Evaluation

- *Incomplete*