Marine Science

Semester A Summary:

Have you ever wondered about the secrets of the deep, and how the creatures below the ocean's surface live and thrive? It is truly a new frontier of discovery, and in Marine Science, you will begin to understand a great deal more about the aquatic cycles, structures, and processes that generate and sustain life in the sea. Through the use of scientific inquiry, research, measurement, and problem solving, you will conduct various scientific procedures that will lead to an increased level of knowledge about Marine Science. You will also have the opportunity to use technology and laboratory instruments in an academic setting. By recognizing the inherent ethics and safety procedures necessary in advanced experiments, you will become progressively more confident in your abilities as a capable marine scientist.

Semester A Outline

1. **About the Earth**
    1. Read and Respond
        - Define marine science.
        - Describe the development of oceans.
        - Explain different movements in plate tectonics and their results.
        - Discuss the scientific method.
        - Differentiate between a hypothesis and a theory.
    2. Unit 1 Lab
    3. Wrapping Up Unit 1
2. **Water and the Environment**
    1. Read and Respond
        - Describe the distinct qualities of water.
        - Summarize the conditions that lead to climate change around lakes and oceans.
        - Discuss the role of water currents and wind in shaping climate.
        - Identify the sources of watersheds and the factors that influence them.
        - Differentiate between a science and pseudoscience.
    2. Unit 2 Lab
    3. Unit 2 Activity
    4. Science Experiment Part 1
    5. Wrapping Up Unit 2
3. **Tides**
    1. Read and Respond
        - Discuss oceanic and freshwater processes, such as tides and currents.
        - Describe changes in ecosystems resulting from environmental shifts.
        - Differentiate among freshwater, brackish, and saltwater ecosystems.
        - Identify the biotic and abiotic elements of an ecosystem.
        - Recognize the role of carbon and nutrient cycles in an aquatic environment
    2. Unit 3 Lab

3. Wrapping Up Unit 3
4. **Water and Weather**
    1. Read and Respond
        - Identify the levels of the earth's atmosphere.
        - Explain the causes of severe weather.
        - Describe the behavior of gases in the ocean.
        - Discuss the significance of the water- and carbon cycles.
        - Cite evidence of climate change in the ocean
    2. Unit 4 Lab
    3. Science Experiment Part 2
    4. Wrapping Up Unit 4
5. **Energy in the Ocean**
    1. Read and Respond
        - Identify the levels of the earth's atmosphere.
        - Explain the causes of severe weather.
        - Describe the behavior of gases in the ocean.
        - Discuss the significance of the water- and carbon cycles.
        - Cite evidence of climate change in the ocean
    2. Unit 5 Lab
    3. Science Experiment Part 3
    4. Wrapping Up Unit 5
6. **Marine Science A Final Exam**
    1. Marine Science A Final Exam
        - Review information acquired and mastered from this course.
        - Take a course exam based on material from this course.

Semester B Summary:

Have you ever wondered about the secrets of the deep, and how the creatures below the ocean's surface live and thrive? It is truly a new frontier of discovery, and in Marine Science, you will begin to understand a great deal more about the aquatic cycles, structures, and processes that generate and sustain life in the sea. Through the use of scientific inquiry, research, measurement, and problem solving, you will conduct various scientific procedures that will lead to an increased level of knowledge about Marine Science. You will also have the opportunity to use technology and laboratory instruments in an academic setting. By recognizing the inherent ethics and safety procedures necessary in advanced experiments, you will become progressively more confident in your abilities as a capable marine scientist.

Semester B Outline

1. **The Ocean and Its Populations**
    1. Read and Respond
        - Identify the layers of the ocean and their characteristics.
        - Discuss the importance of adaptation for survival.
        - Analyze the role of natural selection in evolution.
        - Describe the characteristics of a population.
        - Articulate the methods used to identify and monitor marine populations.
    2. Unit 1 Lab
    3. Unit 1 Activity
    4. Wrapping Up Unit 1
2. **Populations that Thrive**
    1. Read and Respond

- Identify the role of a species within a food pyramid.
- Compare and contrast the relationship among organisms.
- Describe the trophic levels.
- Discuss the interactions and interdependence that occur in aquatic environments.
- Evaluate the factors impacting aquatic population cycles.

2. Unit 2 Lab
3. Unit 2 Activity
4. Science Experiment Part 1
5. Wrapping Up Unit 2

3. **Human Interaction and the Environment**
    1. Read and Respond
        - Identify the large-scale environmental impact of human activity on marine systems.
        - Evaluate how the environment and personal health are related.
        - Investigate the role of humans in unbalanced ecosystems.
        - Analyze the role of human activities that influence marine environments.
        - Recognize the value of non-renewable resources.
    2. Unit 3 Lab
    3. Wrapping Up Unit 3
4. **The Past and Future of Marine Science**
    1. Read and Respond
        - Describe the history of marine science.
        - Identify the contributions of individuals to marine science.
        - Articulate the ethical expectations in marine science.
        - Recognize that scientific questions and conclusions may be influenced by social and cultural concerns.
        - Distinguish between scientific and ethical questions.
    2. Unit 4 Lab
    3. Unit 4 Activity
    4. Science Experiment Part 2
    5. Wrapping Up Unit 4
5. **Careers in Marine Science**
    1. Read and Respond
        - Describe career options in marine science.
        - Identify the function of systems thinking in aquatic environments.
        - Discuss the role of technology in marine science.
        - Explain how science factors into human decision making.
        - Recognize that marine science requires a variety of approaches and contributions.
    2. Unit 5 Lab
    3. Unit 5 Activity
    4. Science Experiment Part 3
    5. Wrapping Up Unit 5
6. **Marine Science B Final Exam**
    1. Marine Science B Final Exam
        - Review information acquired and mastered from this course.
        - Take a course exam based on material from this course.

