

1. OCEAN STRUCTURE AND MOTION

This module begins by answering the question “What is an ocean?” and compares it to seas gulfs and straits. The structure of the earth, the concepts of continental drift and sea floor spreading are examined. The physical properties of sea water (temperature, density, salinity and others) are discussed. The causes and dynamics of ocean currents, waves and tides are examined.

2. COASTAL ZONES

This module examines coastlines and the offshore in general, but looking at the Maritimes in particular. This will enable students to understand and appreciate the complex nature and diversity of coastal zones. The importance of the coastal zone in terms of industrial use, development, protection, and pollution is examined.

3. THE MARINE BIOME

This module looks at ocean life from a global perspective initially, emphasizing the vastness and dynamic nature of the marine biome in time and space. Relations among organisms (symbiosis, predator/prey) are then examined, and varieties of food webs (tropical, temperate, polar) are studied. A local ecosystem, the Bay of Fundy is examined, in particular the relationship between Right Whales and their food supply. Students will also be able to integrate what they learned in the first 2 modules in the study of the Bay of Fundy.

The life history and structural/behavioural adaptations of a few representative organisms from different tropic levels are discussed.

4. FISHERIES

This module explores the marine fishing industry. The major fish of the North Atlantic Ocean are described, as well as various methods of commercial fishing, so students can appreciate the diverse methods of obtaining fish and the influence of each method on the fish stocks.

Oceans 11 – OCEANS11

General Curriculum Outcomes

Oceans 11 is the study of the waters of the ocean, structure of the ocean floor, and life in the ocean. The course offers students the opportunity to explore many aspects of global oceanography, but emphasis is placed on the local level (the Maritimes) and Canada's role in ocean studies. Topics range from the structure of the earth, currents, waves, tides, marine biology, fisheries, pollution and other ocean-related studies.

Oceans 11 is intended to enable students to develop a sound scientific oceans background, an awareness of future opportunities in the oceans field, an understanding of the importance of a healthy oceans environment, and a recognition of the important roles of every Canadian in oceans management.

Students are required to complete three compulsory modules: Ocean Structure and Motion, Coastal Zones and The Marine Biome. In addition, a unit on Fisheries is a part of the course work.

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Course Units and Outcomes

1. OCEAN STRUCTURE AND MOTION

- identify and describe science- and technology-based careers related to ocean-related employment (117-7)
- identify oceans and related water areas in the world (OSM-01)
- analyse the basic structure of the Earth's waters (OSM-02)
- describe examples of Canadian contributions to science and technology (117-10)
- compile and display evidence and information, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, and graphs (214-3)
- identify and describe the unique properties of water (OSM-03)
- use instruments effectively and accurately for collecting data (213-3)
- identify and describe the currents globally and in the Northwest Atlantic area (OSM-04)
- explain the role of the Coriolis Effect in the relationship between wind and current direction (OSM-05)
- illustrate how science attempts to explain natural phenomena (115-2)
- explain how thermohaline currents are produced (OSM-06)
- state a prediction and a hypothesis based on available evidence and background information (212-4)
- identify and describe wave motion found in the marine environment and in everyday situations (OSM-7)
- compile and display evidence and information, by hand or computer, in a variety of formats, including diagrams, flow charts, tables and graphs (214-3)
- interpret patterns and trends in data, and infer or calculate linear and nonlinear relationships among variables (214-5)

2. COASTAL ZONES

- discuss the concept of coastal zone (CZON-01)
- describe how coastal zones vary around the world (CZON-02)
- describe and explain the causes of observed variations in coastal zone structure (CZON-03)
- describe the characteristics of major types of coastal zones (CZON-04)
- manipulate population statistics regarding proportions of populations residing in coastal areas globally and in Canada (CZON-05)
- identify and explain the importance of coastal zones as regions potentially rich in resources (CZON-06)
- identify and explain the importance of sustainability as a theme to manage human use of an environment (CZON-07)

- list and discuss the human activities and natural processes involved in the coastal zone environment (CZON-08)
- major sources of pollution affecting coastal zones and their potential effects on the environment (CZON-9)
- describe the competing views on coastal zone development (CZON-10)

3. **THE MARINE BIOME**

- describe the biodiversity of ocean life and determine interconnections that exist within the marine biome (MBIO-01)
- identify questions about the marine biome (212-1)
- describe the usefulness of scientific nomenclature systems in organizing the study of the tremendous biodiversity of life in the ocean (114-8)
- illustrate how science attempts to explain natural phenomena (115-2)
- explain the function of the marine biome (MBIO-02)
- explain how scientific knowledge of marine biological communities evolves as new evidence comes to light (115-6)
- identify and describe the nature of the connections between humans and the marine biome (MBIO-03)
- compare representative marine organisms and communities (MBIO-04)
- state a prediction and a hypothesis based on available evidence and background information (212-4)
- compare the characteristics of the open ocean and coastal zone (MBIO-05)
- analyze factors that affect productivity and species distribution in open oceans and coastal waters (MBIO-06)
- describe features of marine physiography which impact on the biological communities of local ecosystems (MBIO-07)
- interpret patterns and trends in data, and infer or calculate linear and nonlinear relationships among variables (214-5)
- define and use terms related to the life zones of the marine environment (MBIO-08)
- select and use apparatus and materials safely during dissection procedures (213-8)
- discuss the fragility of the ecosystem and the role/responsibility of people to protect it (MBIO-09)
- explain how a particular organism functions in its habitat (MBIO-10)

4. **FISHERIES**

- identify questions to investigate that arise from a fishery (212-1)
- explain fisheries terminology (FISH-01)
- explain how the fisheries are a unique, renewable resource (FISH-02)
- explain the importance of fish to global and local food supply and employment (FISH-03)

- interpret patterns and trends in data, and infer or calculate linear and nonlinear relationships among variables (214-5)
- use library and electronic research tools to collect information on a given topic (213-6)
- evaluate the relevance, reliability and adequacy of data and data collection methods (214-8)
- explain the dynamic interrelationship between the physical environment, the biological environment and the health and distribution of a fish stock (FISH-05)
- compare the risks and benefits to society and the environment of applying scientific knowledge or introducing a technology (118-1)
- provide examples of how science and technology are an integral part of their lives and their community (117-5)
- analyze society's influence on scientific and technological endeavours (117-2)
- identify examples where scientific understanding was enhanced or revised as a result of the invention of a technology (116-1)
- identify examples where technologies were developed based on scientific understanding (116-3)