

Marine Science

Russell
Hollingworth



International AS and A Level Marine Science 9693

Exam board:

Cambridge Assessment International
Education (CAIE)

Duration of course: 2 years (A level), 1 year (AS level)

Prerequisites: None, but we recommend students have at least a pass in GCSE Maths and one Science



How is the A level assessed?

Assessment:

Candidates are evaluated through externally assessed examinations in the June examination series each year.

AS Level: 2 exams

Paper 1 Structured questions

Paper 2 Structured and free response questions

A Level: above and 2 additional exams

Paper 3 Paper 1 Structured questions

Paper 2 Data analysis and free response questions

AS Level

Paper 1 Structured questions

1 hour 45 min

75 Marks

Short answer questions covering all the topics at AS level

Paper 2 Structured Questions

1 hour 45 min

75 Marks

A Level: 2 exams (plus AS)

Paper 3 Structured and free response questions (45 marks and 30 marks respectively)

1 hour 45 min

75 Marks

Paper 2 Data handling and extended response questions

1 hour 45 min

75 Marks

What will I study in Marine Science?

Marine Science brings together elements of all the Sciences, Physics, Chemistry and Biology. We then study these within the ambit of the Marine Environment, then we also use elements of Geography, Meteorology, Geology, Oceanography and the Social Sciences.

This makes Marine Science an excellent place to apply some of your knowledge from other subjects.

At AS Level we start by learning about the marine environment, both the living and nonliving parts.

At A level we then explore more about the physiology of marine animals and the influence of humans on the marine environment.

Topics that we cover at AS (Year 12)

1. Water

Particle theory and bonding

Solubility in water

Density and pressure

2. Earth processes

Tectonic processes

Weathering, erosion and sedimentation

Tides and ocean currents

3. Interactions in marine ecosystems

Interactions

Feeding relationships

Nutrient cycles

4. Classification and biodiversity

The classification of marine organisms

Key groups of marine organisms

Biodiversity

Populations and sampling techniques

5. Examples of marine ecosystems

The open ocean

The tropical coral reef

The rocky shore

The sandy shore

The mangrove forest

Topics that we cover at A2 (Year 13)

6. Physiology of marine organisms

General cell structure
Movement of substances
Gas exchange
Osmoregulation

7. Energy

Photosynthesis
Chemosynthesis
Respiration

8. Fisheries for the future

Life cycles
Sustainable fisheries
Marine aquaculture

9. Human impacts on marine ecosystems

Ecological impacts of human activities
Global warming and its impact
Ocean acidification
Conservation of marine ecosystems

Skills that we develop

Apart from the knowledge that we have to learn, Marine Science A Level puts a great emphasis on developing skills such as....

Research - You will be asked during the course to research some questions and learn about finding reliable sources.

Scientific method - Working in Science involves research, observation, hypothesis and experimentation.

Practical Experimental Skills - The course involves a number of core practicals to develop skills.

Maths - Statistical Maths is used during the course to evaluate experimental data and calculate physical properties.

What are the does a Marine Scientist look look?

- An analytical mind with an interest in finding answers
- Logical approach to problem solving
- Strong observation and laboratory skills
- Love of the ocean and marine life
- Keen interest in research
- Ability to work indoors or out
- Flexible in changing weather and work environments
- Excellent analysis and communication skills



What can I do after an A level in Marine Science?

To move forwards in Science at University you will be expected to have also the relevant Science A Levels (Physics, Biology, Chemistry).

However, Marine Science will give you more points for your university application.

Marine Science is interesting and covers a wide range of topics, you will enjoy studying and will find yourself achieving higher grades more easily.

Marine Science will benefit any student who eventually finds themselves working in the Marine Environment.

Potential careers include, Marine Biologist, Oceanographer, Meteorologist, Marine Engineer, Boat Captain...

Two major Scientific career paths in Marine Science are that of a Marine Biologist or an Oceanographer.

How is an Oceanographer's Job Different from a Marine Biologist?

Oceanographer

- Collect data on ocean temperatures and salinity
- Study the plate tectonics and volcanic activity of the sea floor
- Learn how waves, currents and tides move sand on and off beaches and how it impacts erosion
- Understand how the ocean influences climate and how to measure changes
- Study pollution, eutrophication and algae blooms and find restorative solutions
- Discover how the environment impacts ocean life, including dolphins, jellyfish and sea turtles

Marine Biologist

- Study whales and if and how water temperature affects migration of animals
- Study the effects of an oil spill on plant and animal life or how pollutants contribute to algal blooms
- Determine the impact of human activity on a coral reef
- Understand lifecycles of marine organisms and their global importance
- Uncover ways to sustain and protect ecosystems and living resources from negative human impacts



OUR WORLD OCEAN provides

THE AIR WE BREATHE



>50% The ocean produces over half of the world's oxygen and stores 50 times more carbon dioxide than our atmosphere.

CLIMATE REGULATION

70% Covering 70% of the Earth's surface, the ocean transports heat from the equator to the poles, regulating our climate and weather patterns.



TRANSPORTATION



76% Percent of all U.S. trade involving some form of marine transportation.

RECREATION



From fishing to boating to kayaking and whale watching, the ocean provides us with so many unique activities.

ECONOMY



\$282 billion Amount the U.S. ocean economy produces in goods and services. Ocean-dependent businesses employ almost 3 million people.

FOOD

The ocean provides much more than just seafood. Ingredients from the sea are found in surprising foods such as peanut butter and soy milk.



MEDICINE

Many medicinal products come from the ocean, including ingredients that help fight cancer, arthritis, Alzheimer's disease, and heart disease.



In a global society
Marine
Science
issues will
shape our
futures..