

International Ocean Literacy Survey – Final Version

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The correct answers are indicated with **

Select the one best response for each question.

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| What is the best explanation of how ocean water moves? |
| Water in each ocean basin (e.g., Atlantic, Pacific, Indian) moves only within that basin. |
| **Water in the Pacific ocean basin will eventually move to all other ocean basins. |
| Ocean water moves throughout either the northern hemisphere or the southern hemisphere. Water does not cross the equator. |
| Water in smaller basins, like the Mediterranean Sea, remains there and does not move to other basins. |

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| Because the ocean covers most of the Earth: |
| **it has the most dominant influence on Earth's weather and climate. |
| most living things are concentrated on land. |
| most of the Earth is not useful for humans. |
| it generates most of the Earth's greenhouse gases. |

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| Which statement describes the main process that shapes the features of the land and the ocean floor? |
| **Both the land and the ocean floor are shaped by movement of the Earth's crust. |
| Erosion caused by rivers brings material from the land to the ocean which shapes the ocean floor. |
| Both land and ocean features are shaped by the wind. |
| Both the land and the ocean floor are shaped by changes to climate. |

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| Ocean currents are influenced by both: |
| global ship traffic and Earth's rotation. |
| **the position of land masses and Earth's rotation. |
| global ship traffic and the acidity of the ocean. |
| adjacent land masses and the acidity of the ocean. |

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| How is sea level measured? |
| Average depth of the ocean. |
| **Average height of the ocean relative to the land. |
| Height of the ocean relative to land at the lowest tide. |
| Height of the ocean relative to land at the highest tide. |

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| Which of these statements about seawater and freshwater is true? |
| **Seawater freezes at a lower temperature than freshwater, and seawater conducts electricity better than freshwater. |
| Seawater freezes at a higher temperature than freshwater, and seawater conducts electricity better than freshwater. |
| Seawater freezes at a lower temperature than freshwater, and freshwater conducts electricity better than seawater. |
| Seawater cannot freeze and seawater conducts electricity better than freshwater. |

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| Where is most of the water on Earth? |
| In the atmosphere. |
| In polar ice caps. |
| In rivers and lakes. |
| **In the ocean. |

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| Which of the following is the most accurate about the water in the Earth's water cycle? |
| **Much of the same water has been traveling through the water cycle for millions of years. |
| Water joins the water cycle when new water is made through condensation. |
| Water leaves the water cycle when it evaporates from the ocean. |
| Water leaves the water cycle when humans and other organisms drink it. |

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| What connects the ocean to all water on Earth? |
| Transpiration and precipitation. |
| **Precipitation and evaporation. |
| Deposition and evaporation. |
| Deposition and transpiration. |

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| Rivers supply most of the salt to the ocean. The salt in the rivers comes from: |
| mountain ice melting. |
| **erosion of land. |
| rainfall in the rivers. |
| human caused pollution. |

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| Sand on the shoreline is: |
| likely to stay on the same beach for hundreds of years. |
| **continually transported by waves and currents. |
| continually transported by activities of animals that live there. |
| likely to be transported inland by wind and rivers. |

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| What occurs during an El Nino year? |
| There are large but temporary changes in the salinity of the ocean. |
| The temperature of the ocean gets colder. |
| **There are large but temporary changes in global weather patterns. |
| There are large permanent changes in global weather patterns. |

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| Most rain that falls on land originally evaporated from: |
| **the ocean near the equator. |
| the middle of each ocean basin. |
| nearby lakes and rivers. |
| the nearest ocean basin. |

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| The ocean affects climate change by absorbing, storing, and moving: |
| carbon and salt. |
| **carbon and heat. |
| phytoplankton and heat. |
| phytoplankton and salt. |

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| How is climate change impacting the Arctic? |
| The impact on the Arctic is the same as on the rest of the planet. |
| **The Arctic is warming faster than the rest of the planet. |
| Glaciers are melting in some parts of the Arctic and growing in other parts. |
| Tropical ocean fishes are migrating to the Arctic. |

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| Where did most of the oxygen in the atmosphere originally come from? |
| Released into the atmosphere by volcanos erupting. |
| From interstellar gases when the Earth was first formed. |
| Released during photosynthesis by land plants. |
| **Released during photosynthesis by marine organisms. |

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| Fossil evidence shows that life most likely first evolved: |
| on land. |
| **in the ocean. |
| under Earth's surface. |
| in outer space. |

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| What is the largest animal ever to live on Earth? |
| Giant squid. |
| Woolly mammoth. |
| **Blue whale. |
| Giganotosaurus. |

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| Most living material (biomass) in the ocean is found in: |
| fishes (sharks, salmon, cod, etc.). |
| **plankton (jellyfish, krill, diatoms, etc.). |
| marine mammals (whales, dolphins, walruses, etc.). |
| molluscs (snails, clams, squid, etc.). |

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| There are over 30 major groups of organisms (vertebrates, arthropods, molluscs, etc.) on Earth. Where are most of these major groups found? |
| Most are found exclusively in the tropical rainforests. |
| Most are found on both land and in the ocean. |
| About half are found exclusively in the ocean. |
| **Almost all are found exclusively in the ocean. |

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| Both land and ocean provide space for organisms to live. How much of Earth's living space is found in the ocean? |
| Only a little bit (less than 10%). |
| About half (40–60%). |
| More than half (60–80%). |
| **Nearly all (more than 90%). |

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| In the ocean, organisms are found: |
| ** at the surface, in the water column, on the sea floor, and on the seashore. |
| at the surface, on the sea floor, and on the seashore but not in the water column. |
| on the sea floor and in the water column, but not on the surface or on the seashore. |
| mostly in the water column and on the sea floor but not at the surface or on the seashore. |

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| Which of the following most influences the depth at which organisms live in the open ocean (away from the shoreline)? |
| Salinity levels. |
| Crashing waves. |
| **Light levels. |
| Human activity. |

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| What is the source of energy for ocean ecosystems where there is no sunlight? |
| **Chemical energy from hydrothermal vents. |
| Wave energy from the wind. |
| Nuclear energy from underwater radioactive material. |
| Thermal energy from volcanoes. |

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| Which of the following has the largest influence on the vertical distribution of organisms on the seashore? |
| Sunlight. |
| Salinity. |
| **Tides. |
| Trampling by people. |

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| Which of the following marine ecosystems is the most important nursery areas for many marine species? |
| Coral reefs (reefs formed by living corals). |
| The deep sea (more than 100m below the ocean surface). |
| The open ocean (away from the shoreline). |
| **Estuaries (where rivers meet the ocean). |

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| What is the best explanation of ocean acidification? |
| **Burning fossil fuels (coal, oil, etc.) adds carbon dioxide to the atmosphere, which is absorbed by the ocean and increases its acidity. |
| Pollution adds toxic chemicals to the ocean that increases its acidity. |
| Fertilizers from agriculture are washed into the ocean and this increases the acidity of the ocean. |
| Upwelling of naturally acidic sea water from deep in the ocean increases the acidity at the surface. |

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| Which of the following are happening because of human-caused changes to ocean temperatures and pH levels? |
| Ocean salinity is increasing and the frequency of oil spills is increasing. |
| The frequency of oil spills is increasing and many coral reefs are degraded or dying. |
| **Many coral reefs are degraded or dying and the diversity of life in the ocean is decreasing. |
| The diversity of life in the ocean is decreasing and ocean salinity is increasing. |

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| The use of satellites, buoys, and remotely-operated vehicles improve our understanding of the ocean because the new technologies: |
| reduce errors from human measurements of the ocean. |
| cause less disturbance to the marine environment. |
| are cheaper than previous tools. |
| **collect much more data than scientists on ships can. |

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| Sea level changes have: |
| reversed the direction that some rivers flow. |
| changed global temperatures. |
| ** changed the shape of the coastline. |
| increased fish populations. |

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| Scientists are discovering that more species than they expected live in the deep sea. These discoveries are only being made now because: |
| environmental conditions are causing species to migrate to the deep sea. |
| deep sea species evolve more rapidly than shallow water species. |
| shallow water species have been overfished. |
| ** scientists are just beginning to explore the deep sea. |

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| Which of the following is the best way for scientists to make predictions about complex ocean and atmospheric interactions, like hurricanes and climate change? |
| Simulations in aquariums |
| Detailed long term monitoring of ocean and atmosphere. |
| Observations of coastlines. |
| **Mathematical modeling. |

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| Making new discoveries about the complexity of the ocean requires: |
| a degree in marine biology. |
| living near the ocean. |
| **collaboration among people with different expertise. |
| use of SCUBA gear for diving. |

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| Over the last 50 years humans have: |
| **increased their use of ocean resources. |
| explored most of the ocean. |
| reduced total emissions from ships into the ocean. |
| reduced unsustainable use of ocean resources. |

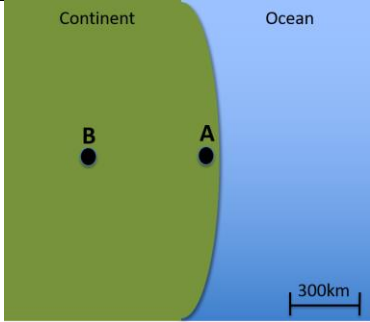
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| Absorption of carbon dioxide (CO ₂) by the ocean has a direct influence on which of the following? |
| The greenhouse effect and dead zones in the ocean. |
| Acid rain and harmful algal blooms. |
| Acid rain and ocean acidification. |
| **The greenhouse effect and ocean acidification. |

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| Clams, oysters, and other marine organisms use the carbon dissolved in the ocean to: |
| breathe underwater. |
| regulate body temperature. |
| **build shells. |
| assist in reproduction. |

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| Which of the following is true about ecological relationships in the ocean? |
| They are very similar to those on land, including similar food web, life cycle, and symbiotic relationships. |
| They are mostly unknown since so much of the ocean has not been explored. |
| They are mostly very simple compared to those on land. |
| **There are unique features of food webs, life cycles, and symbiotic relationships in the ocean that are not found on land. |

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| Which of the following is true concerning the exploration of the ocean? |
| People have been exploring the ocean for thousands of years and most of it has been explored. |
| Almost all of the ocean has been explored in the last 50 years because of new technology. |
| **Most of the ocean is still unexplored despite improvements in technology in the last 50 years. |
| Most of the ocean is still unexplored because scientists focus on the areas where most organisms live. |

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| Look at the image. If both cities are at the same elevation, it is likely that: |
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| city A will have warmer summers and cooler winters than city B. |
| city A will have warmer summers and warmer winters than city B. |
| **city A will have cooler summers and warmer winters than city B. |
| city A will have similar temperatures as City B in each season. |

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| If there was no ocean, the Earth's surface temperatures would be: |
| **more extreme around the world. |
| less extreme around the world. |
| cooler in the summer and warmer in the winter. |
| about the same as they are now. |

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| Ocean resources: |
| are sufficient to support today's fishing practices into the future. |
| can always be replaced with resources from another part of the ocean. |
| replenish themselves quickly. |
| ** are limited and in rapid decline around the world. |

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Complete each of the following sentences with the statements below them, and mark each one true or false.

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| Rivers can transport _____ to the ocean. |
| nutrients (False/**True) |
| sand (False/**True) |
| rocks (False/**True) |
| pollutants (False/**True) |

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| Changes to sea level are caused by _____. |
| movement of the continental plates (FALSE/**TRUE) |
| melting and growing of ice caps on land (FALSE/**TRUE) |
| warming and cooling of ocean water (FALSE/**TRUE) |
| movement of sediments from coastal erosion (**FALSE/TRUE) |

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| Changes to the shape of coastlines are caused by _____. |
| sea level changes (FALSE/**TRUE) |
| seawater salinity changes (**FALSE/TRUE) |
| movement of the continental plates (FALSE/**TRUE) |
| forces of waves (FALSE/**TRUE) |

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| Humans depend on the ocean for _____. |
| food and medicine (FALSE/**TRUE) |
| minerals and energy resources (FALSE/**TRUE) |
| transportation and jobs (FALSE/**TRUE) |
| benefits to the economy (FALSE/**TRUE) |
| nuclear fusion (**FALSE/TRUE) |

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| Industrial development by humans has lead to _____. |
| ocean pollution (FALSE/**TRUE) |
| changing the shape of the coastline (FALSE/**TRUE) |
| increasing ocean acidity (FALSE/**TRUE) |
| Increasing the frequency of tsunamis. (**FALSE/TRUE) |
| improving conditions for indigenous people (**FALSE/TRUE) |

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| Humans use the ocean for _____. |
| earthquake and tsunami prediction (**FALSE/TRUE) |
| recreation (FALSE/**TRUE) |
| food and medicine (FALSE/**TRUE) |
| art and cultural heritage (FALSE/**TRUE) |
| transportation (FALSE/**TRUE) |

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| Caring for and protecting the ocean is the responsibility of _____. |
| leaders of each country because they set national policies (FALSE/**TRUE) |
| highly intelligent ocean animals like whales and dolphins (**FALSE/TRUE) |
| individuals because everyone benefits from the ocean regardless of where they live (FALSE/**TRUE) |

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| The ocean affects your life because it _____. |
| provides much of the oxygen you breathe (FALSE/**TRUE) |
| provides nuclear energy to heat your home (**FALSE/TRUE) |
| supplies the rain that grows your food (FALSE/**TRUE) |
| influences the climate of the place where you live (FALSE/**TRUE) |

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| Mark each statement TRUE or FALSE. |
| Mark each geology statement below TRUE or FALSE |
| Many rocks on land were formed in the ocean. (FALSE/**TRUE) |
| Rocks on land are formed differently from rocks in the ocean. (**FALSE/TRUE) |
| Geological processes (e.g., volcanoes and earthquakes) can push rocks formed in the ocean above the surface of the ocean. (FALSE/**TRUE) |

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| Mark each statement below about human impacts to the ocean TRUE or FALSE |
| People who live far from the ocean do not cause pollution in the ocean. (**FALSE/TRUE) |
| Airplanes increase the rate of ocean acidification more than other forms of transportation. (FALSE/**TRUE) |
| All people, regardless of where they live, cause pollution in the ocean. (FALSE/**TRUE) |
| People who live near the ocean contribute more to ocean acidification than people who live far from the ocean. (**FALSE/TRUE) |

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| Mark each of the statements below about the ocean and atmosphere TRUE or FALSE. |
| Interactions between the ocean and the atmosphere strongly influence weather and climate. (FALSE/**TRUE) |
| There are different seasons throughout the year because the ocean absorbs much of the heat from the sun. (**FALSE/TRUE) |
| The water cycle is powered by the transfer of heat between the ocean and the atmosphere. (FALSE/**TRUE) |
| Transfer of heat between the ocean and the atmosphere drives global circulation of water and air and can cause storms around the world. (FALSE/**TRUE) |