

Sea Sick: The Global Ocean in Crisis

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THE BROAD STAGE AT THE SANTA MONICA COLLEGE PERFORMING ARTS CENTER
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“...you can use your curiosity to find stuff out, but...need art to really explain what it means.”

– Alanna Mitchell



Alanna Mitchell

Award winning journalist, Alanna Mitchell sailed on five ships, exploring the ocean with celebrated scientists and when she returned to land, she was compelled to write her book *Sea Sick*. The inspiration to make the transition from ship to book to play came from the unrelenting sense of responsibility to build a bridge from scientists, who hold the knowledge, to the public who desperately need to know. As a journalist, who has been trained to never tell a story the same way twice, she armed herself with the storytelling ability of an artist, convinced that only the power of art would be effective in communicating such an important message. In *Sea Sick*, she highlights the impact that human actions have on the ocean, the planet’s most vital and largest resource. She calls attention to our ability to make changes that will have a positive impact on the ocean and the ecosystem within it, both of which are essential to life on this planet. Mitchell’s mesmerizing presentation seeks to inspire us to take an active part in authoring our own planet’s story.

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“I write about stories no one else is covering. Sometimes, that means they’re hard for people to hear.”

– Alanna Mitchell

WHAT IS ENVIRONMENTAL JOURNALISM?

Environmental journalists write about the earth’s resources, **ecology**, health and scientific findings. Through research, investigation, interviews and expeditions, environmental journalists educate us about the cause and effect of environmental issues on both a small and large scale.

Environmental journalism includes the work done by scientists who know that reducing pollutants in our environment is not only important for the health of our planet, but also essential for human health. The study of pollution helps us to know what behaviors and elements change our environment so that we can better protect our air, water and earth.

Along with the environmental journalist’s responsibility to accurately report what they see and learn, comes the possibility to inspire people and communities to take action, adopt practices and champion laws that support **environmental sustainability**. This might mean joining a day of action, signing a petition, or lobbying schools and government officials to advocate for collective action. Getting humans to change their habits can be challenging, but an environmental journalist can help raise awareness and present tangible scientific solutions that will inspire people to get involved in securing the future of our planet.

WHAT IS THE DIFFERENCE BETWEEN WEATHER AND CLIMATE CHANGE?

Weather refers to the state of the atmospheric conditions in a particular area in terms of heat, dryness, sunshine, rain, etc. Climate is the weather of a specific region averaged over a long period of time. Climate change is a long term change in the weather patterns that have come to define global regions. Climate change has always existed, but it is the rate and magnitude with which it is currently happening that is causing great global concern. Although there are natural causes for climate change, the **anthropogenic**, or human-induced, factors, such as greenhouse gases, are the ones that have rapidly increased. Global warming is an aspect of climate change and refers to the rise in global temperatures due to the concentrations of greenhouse gases in the atmosphere. This pollution of the atmosphere is in turn causing adverse changes in the air, land and water of the Earth.



WHAT IS OCEAN ACIDIFICATION?

The same gases (nitrous oxide, methane, carbon dioxide and fluorinated gases) that are creating climate change are also being absorbed from the atmosphere by the ocean, but it is **carbon dioxide** that specifically causes ocean acidification, or a decrease in the pH level. This change has a negative impact on aquatic life and by extension on humans. The level of **acidity** of a liquid is what is identified with the pH range of 0-14. The lower the number, the more acidic the pH. Human blood, for example, has to have a pH between 7.35 and 7.45 in order for us to live. Likewise, the ocean has a pH level, which was 8.20 before the Industrial Revolution in the early 1800’s. Now, the ocean’s pH level is 8.05, which may not seem like a big difference, except that pH is measured on an exponential scale. This means that one level is 10 times greater than the next. If the pH is at 4, it is ten times more acidic than a pH of 5 and is 100 times more acidic than a pH of 6. As the ocean has become 30% more acidic, its ecosystem has been greatly disrupted and faces challenges that impact our entire planet.



VOCABULARY

ECOLOGY: Branch of biology that studies how people or organisms relate to each other and their environment.

ENVIRONMENTAL SCIENCE: Interdisciplinary academic field that integrates physical, biological and information sciences to the study of the environment, and the solution of environmental problems.

ENVIRONMENTAL STUDIES: Broadens the field of environmental science by including a greater emphasis on the political, economic and social aspects related to the environment, including sustainability.

RENEWABLE ENERGY: Energy produced from sources that can be replenished within a human's lifetime; most common are wind, solar, geothermal, biomass and hydropower.

ENVIRONMENTAL SUSTAINABILITY: Creating and maintaining conditions under which humans and nature can exist in harmony to support present and future generations.

CARBON DIOXIDE OR C-O-2: A colorless, odorless gas, present in the atmosphere and that is produced when any carbon fuel is burned and is also breathed out by animals and humans.

HYDROELECTRICITY: Electricity produced by converting fast-flowing water into energy.

FUN FACTS

The use of **renewable energy** is expanding across the globe. Hydropower, wind, solar, geothermal heat and biomass energy from plants all contribute to the ways we can create electricity and power, while diminishing further pollution by greenhouse gases. Mostly rivers, not oceans, create **hydroelectricity**. Can you guess where the largest hydroelectric dam is? The Three Gorges Dam on the Yangtze River in China was completed in 2015 and is 7,660 feet long, which is about a mile and a half. The Chinese dam produces 20 times the electricity of the famous Hoover Dam in Nevada. Worldwide, hydropower makes up 70% of renewable energy sources.

TRY THIS

WRITE A JOURNALISTIC ARTICLE

Journalists investigate and write about people, places, situations and issues, sharing their findings in articles, books, various media and even theatrical presentations. What stories are you interested in or passionate about? Is there a topic that you want to make more visible or highlight? Brainstorm a list of ideas and write your own article to start your path to becoming a journalist. Check out the resource page for detailed steps on how to write a journalistic article.

ENVIRONMENTAL ART

Make your own art installation using nature as inspiration and as art materials. Walk in your neighborhood, backyard or visit the beach or park and collect natural materials like small stones, leaves, beach glass, fallen flowers or feathers. You can create a collage or sculpture inspired by nature that represents the world around you. Found natural materials are free, easy to find and simple to work with to create a meaningful environmental art piece. Check out the resource page to see a video with amazing examples.



ENVIRONMENTAL CHEMISTRY

Carefully pour 1 cup of white vinegar into a small container. Break 1 piece of classroom chalk in half. The chalk is made of calcium carbonate, the same as shells, reefs, bones and teeth. Drop both pieces of chalk into the white vinegar and observe the reaction. Although the white vinegar is much more acidic than the ocean, it will have the same type of effect on the chalk as an acidic ocean will have on shells, reefs, bones and teeth.

TAKE IT FURTHER

Check out our [Resource](#) page with website links and relevant state standards to use for the classroom.

WEBSITE AND RESEARCH LINKS:

BOOK: SEASICK, THE GLOBAL OCEAN IN CRISIS

OCEANS-FACTS AND INFORMATION - NATIONAL GEOGRAPHIC

OCEAN ACIDIFICATION

CALCULATE YOUR CARBON FOOTPRINT

HOW TO REDUCE YOUR CARBON FOOTPRINT

ENVIRONMENTAL LITERACY

WHAT IS SUSTAINABILITY?

U.S. GEOLOGICAL SURVEY - WHAT IS THE DIFFERENCE BETWEEN WEATHER AND CLIMATE CHANGE?

JOIN HEAL THE BAY'S MONTHLY BEACH CLEANUP

JOURNALISM: GATHERING INFORMATION AND WRITING YOUR STORY

7 ENVIRONMENTAL ARTISTS FIGHT FOR CHANGE

ENVIRONMENTAL ART VIDEO

SUGGESTED CA STATE STANDARDS:

NINTH THROUGH TWELFTH GRADE STANDARDS

CA VAPA Theatre Grades 9-12 1.1: Use the vocabulary of theatre, such as *acting values, style, genre, design, and theme*, to describe theatrical experiences.

CA VAPA Theatre Grades 9-12 4.2: Report on how a specific actor used drama to convey meaning in his or her performances.

NGSS HS-ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedback that causes changes to other Earth systems.

NGSS HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.

NGSS HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

NGSS HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

NGSS HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

CCSS ELA-Literacy W 9-10.1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

CCSS ELA-Literacy W 9-12.7: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

CCSS HSS 11.11.5: Trace the impact of, need for, and controversies associated with environmental conservation, expansion of the national park system, and the development of environmental protection laws, with particular attention to the interaction between environmental protection advocates and property rights advocates.

CCSS HSS 12.8.1: Discuss the meaning and importance of a free and responsible press.

SOCIAL JUSTICE STANDARDS

DI.9-12.10: I understand that diversity includes the impact of unequal power relations on the development of group identity and cultures.

JU.9-12.13: I can explain the short and long-term impact of biased words and behaviors and unjust practices, laws and institutions that limit the rights and freedoms of people based on their identity groups.

SOCIAL EMOTIONAL COMPETENCIES

Responsible Decision-Making; Identifying Problems, Analyzing Situations, Solving Problems, Evaluating, Reflecting, Ethical Responsibility.