

Big Blue Ocean

**EDUCATOR GUIDE, STUDY
QUESTIONS, & VOCABULARY**



**Are you an
educator or just
want to inspire
youth with BIG
BLUE OCEAN?**

Watch The Video >

<https://bigblueandyou.org/big-blue-ocean>

Science & the Ocean

Although we call the North Pacific, South Pacific, North Atlantic, South Atlantic, Indian, and Arctic “oceans,” they are technically

OCEAN BASINS

There is only **ONE OCEAN** that touches all continents – and its health affects all people.

OCEANOGRAPHERS

study the ocean

OCEANOGRAPHY is one of the newest fields of science: In 1872, the Challenger Expedition was the first to explore the ocean and **SEA FLOOR** which is the bottom of the ocean.

MARINE BIOLOGY is the study of the animals and organisms that live in the ocean.

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Ernest Everett Just was the first Black marine biologist; in 1909, he began researching

INVERTEBRATES

– animals that don’t have spines, like starfish and jellyfish.

In 2010,

ASHANTI JOHNSON

received a Presidential Award for Excellence for work in oceanography.

Marine biologists like

DANNI WASHINGTON

– who is the first Black woman to host a national science show (and co-founder of **BIG BLUE & YOU**) – work to communicate information about the ocean.

Scientists like oceanographers and marine biologists use

ROVs (remote operated vehicles) and **AUVs**

(autonomous underwater vehicles) that “fly” along the sea floor and collect information.



The Ocean & Climate Change

Because of oceanographers and marine biologists, we know that:



The ocean covers **SEVENTY PERCENT** of the Earth's surface.

Forces such as **WIND** cause , **CURRENTS** which move water around the ocean.

Tiny creatures called **PHYTOPLANKTON** use sunlight to make oxygen.

The ocean protects us from **GLOBAL WARMING** by absorbing 90% of excess heat and 25% of carbon dioxide.

More than **FIFTY PERCENT** of the oxygen that we breathe comes from the ocean.

The warming ocean threatens **BIODIVERSITY** – the different types of life in the natural world.

Ocean water is **SALINE**, which means it contains salt.



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Plastic & the Ocean

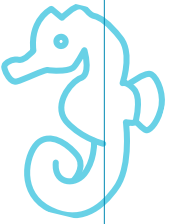
In 1997, the oceanographer Charles Moore discovered **GREAT PACIFIC GARBAGE PATCH** in the middle of the North Pacific ocean basin.

What's that? There are **GYRES** – rhymes with “tires” – which are large currents that trap plastic in the middle of all ocean basins.

Plastic gets into the ocean when it is **LITTERED** or escapes **LANDFILLS** or **RECYCLING FACILITIES** and is transported through **RIVERS, WATER DRAINAGE**, or **WIND** from the land to the ocean.

Once in the ocean, plastic is drawn towards the gyres by currents. Plastic can travel long distances on these currents: Trash from Japan has been found in Hawaii – more **FOUR THOUSAND MILES** than away.

Plastic is not **BIODEGRADABLE** – it can't be broken down by microorganisms such as **BACTERIA**.



Some types of **PLASTIC CAN LAST** for thousands of years.

In the ocean, plastic breaks up into **MICROPLASTICS**, which are tiny pieces of plastic less than five millimeters large.

Microplastics in the ocean are a problem because tiny creatures eat them and then bigger creatures eat those animals: About **THIRTY PERCENT** of fish that we eat have microplastics in their guts.

Microplastics are also a problem because **PLASTIC BLOCKS LIGHT** and prevents plankton from making oxygen.

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How to Protect the Ocean

To help protect the ocean, **REFUSE SINGLE-USE PLASTIC** and choose like cups, bottles, straws, bags, forks, spoons, and knives. **REUSABLES**

Don't **WISHCYCLE** which means putting all plastic in the recycling bin and hoping that it will be recycled: Use [Earth911.org](https://www.earth911.org) to **RESEARCH WHAT'S RECYCLABLE** in your neighborhood and make sure to put those plastics in the recycling bin.

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You can also protect the ocean by taking action to fight climate change:

CONSERVE ENERGY by turning off lights when you're not in a room and unplugging electronic devices you're not using.

SAVE WATER by turning off the tap when you brush your teeth and taking shorter showers.

Use **PUBLIC TRANSPORTATION** like buses or subways or **WALK** or **BIKE**.

EAT LESS MEAT and **COMPOST** vegetable scraps in the green bin or garden.

SPEAK UP with your friends and family about how they can join you to protect the ocean.

Taking actions like these make you an **OCEAN CONSERVATIONIST**, which means you are someone who works – either personally or professionally – to protect the ocean.

Consider studying and/or working in oceanography or marine biology: Only **FIVE PERCENT** of the ocean has been explored – who knows what solutions lie beneath the surface!

Big Blue Ocean Vocabulary

AUVs

BACTERIA

BIODEGRADABLE

BIODIVERSITY

ENDANGERED

EXTINCTION

GYRES

INVERTEBRATES

OCEAN BASIN

OCEANOGRAPHER

OCEANOGRAPHY

MARINE BIOLOGY

MICROPLASTICS

REUSABLES

ROVs

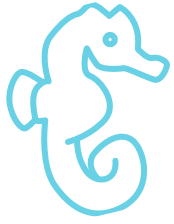
SALINE

SCIENTISTS

SEA FLOOR

WISHCYCLING

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Big Blue Ocean Study Questions



1. How much of the Earth's surface is covered by the ocean?
2. What creatures use sunlight to make oxygen?
3. How much of the oxygen that we breathe comes from the ocean?
4. What forces move water around the ocean?
5. What does the warming ocean threaten?
6. How does the ocean protect us from global warming?
7. What is the Great Pacific Garbage Patch?
8. How do you pronounce "gyres"?
9. How does plastic get into the ocean?
10. How is plastic transported from land to the ocean?
11. Where was trash from Japan found – and how many miles did it travel to get there?
12. What can plastic do to animals?
13. How long can plastic last?
14. How much of the fish that humans eat contain microplastics in their guts?
15. Why are microplastics a problem?
16. How can you avoid wishcycling?
17. What are three ways that you can help protect the ocean?
18. What does taking action to protect the ocean make you?
19. How much of the ocean has been explored?

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