

Brandon Valley School District

District Learning Plan

March 23-27, 2020

Grade 6 Science



Brandon Valley School District Distance Learning Lesson Plans

LESSON/UNIT: Hydrosphere

SUBJECT/GRADE: 6th Science

DATES: March 23 - 27 , 2020

<p>What do students need to do?</p> <p><u>Link to BV instructional video for week of March 23-27, 2020</u></p>	<p>For Science this week, you will read four NEWSLA articles, answer questions, and write two responses about your reading.</p> <p>Monday (3/23):</p> <ul style="list-style-type: none"> Read Newsela article, “Oceanography Studies How the Oceans Affect Life On Earth,” and answer the four questions. <p>Tuesday (3/24):</p> <ul style="list-style-type: none"> Read Newsela article, “Climate Change Raising the Oceans, Making Them Warmer, new Report Says” and answer the four questions. <p>Wednesday (3/25):</p> <ul style="list-style-type: none"> Read Newsela article, “The Great Pacific Garbage Patch Counts 1.8 Trillion Pieces of Trash,” and answer the four questions. <p>Thursday (3/26):</p> <ul style="list-style-type: none"> Using the Newsela articles from last week and this week, write a paragraph response to the following question. <i>WHY IS THE OCEAN IMPORTANT AND HOW DOES IT IMPACT WEATHER AND CLIMATE?</i> <p>Friday (3/27):</p> <ul style="list-style-type: none"> Using the Newsela articles from last week and this week, write a paragraph response to the following question. <i>WHAT IMPACT OR AFFECT DO PEOPLE HAVE ON THE OCEAN?</i>
<p>What do students need to bring back to school?</p>	<ul style="list-style-type: none"> - Article question answers - Paragraph article responses
<p>What standards do the lessons cover?</p>	<p>MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.</p> <p>MS-ESS2-4 Develop a model to describe the cycling of water through Earth’s systems driven by energy from the sun and the force of gravity.</p> <p>MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.</p> <p>MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes.</p> <p>MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.</p> <p>MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and percapita consumption of natural resources impact Earth’s systems.</p> <p>MS-ESS3-5 Ask questions to clarify evidence of the factors that may have caused a change in global temperatures over the past century.</p>
<p>What materials do students need? What extra resources can students use?</p>	<p>Need:</p> <ul style="list-style-type: none"> - NEWSLA articles- Pdf or online (Student Accounts), paper and pencil <p>Extra: https://my.mheducation.com/login (student online textbook- Chapter 16)</p>

What can students do if they finish early?	<ul style="list-style-type: none"> - https://games.noaa.gov/ (Interactive Games- National Oceanic and Atmospheric Administration) - https://kids.nationalgeographic.com/explore/ocean-portal/ (Interactive website) - Independent Reading
Who can we contact if we have questions?	<p><u>Brandon Valley Intermediate School</u></p> <p>Principal- Mr. Skibsted- Nick.Skibsted@k12.sd.us</p> <p>Assistant Principal- Mr. Pearson- Rick.Pearson@k12.sd.us</p> <p>Science Teachers:</p> <p>Mr. Putnam- Mike.Putnam@k12.sd.us (blue team)</p> <p>Ms. Grieve- Tami.Grieve@k12.sd.us (silver team)</p> <p>Ms. Schindling- Kayla.Schindling@k12.sd.us (red team)</p> <p>Mr. VanHeel- Jeremy.VanHeel@k12.sd.us (white team)</p>
<u>Notes:</u> Have a great week!	

Instructional materials are posted below (if applicable)

Brandon Valley School District

Oceanography studies how the oceans affect life on Earth

By National Geographic Society, adapted by Newsela staff on 04.09.19

Word Count **912**

Level **850L**



Image 1. Murat Ates (right) is Sergeant Major at the Turkish Naval Forces' Navigation Hydrography and Oceanography Service. As of February 28, 2019, he has been working with his team to create a map of the sea depth on Horseshoe Island of Antarctica. Photo by: Ozge Elif Kizil/Anadolu Agency/Getty Images.

Oceanography is the study of the ocean, and covers a wide range of topics. The field includes research on marine life and ecosystems. It also includes the science of water currents, waves and seafloor geology.



Oceanographers study how the ocean's processes relate to each other. The chemistry of water, for example, affects which organisms can live in it. In turn, organisms may affect the geology of the seafloor.

Oceanography is divided into four main areas, and oceanographers usually specialize in one of them. These areas are called biological, physical, geological and chemical oceanography.

Biological Oceanography

Biological oceanographers study marine plants and animals. They research how the ocean environment affects living beings. Marine biologists and scientists who work in fisheries are examples of biological oceanographers.

Biological oceanographers also study how species adapt to environmental changes. These changes may include increased pollution and warming waters. Oceanographers also investigate natural and artificial disturbances. A hurricane is an example of a natural disturbance. An oil spill is an example of an artificial, or manmade, disturbance.

The Cetacean Sanctuary Research Project is a marine biology program. It is carried out in the Mediterranean Sea. It focuses on cetaceans, or whale and dolphin species. By analyzing these animals' behavior, oceanographers hope to protect the area's marine life.

Physical



Oceanography

Physical oceanographers study the relationship between marine environments. These environments include the atmosphere, the seafloor, coastlines and the ocean itself. These scientists investigate ocean temperature, waves, tides and currents. They also research the many ways the ocean interacts with Earth's atmosphere. These interactions have a big influence on weather and climate systems.

Oceanographers in South Africa, for example, study the flow of water around the southern tip of Africa. This movement is known as the Agulhas Current. It is part of a larger "ocean conveyor belt" of currents. These currents carry water around the globe.

Physical oceanographers are studying how global warming is affecting ocean currents. They believe global warming will slow the ocean conveyor belt. It could cause big changes in climate and weather patterns.

Geological Oceanography

Geological oceanographers investigate the seafloor. They study the underwater landscape and its changes. They also focus on the physical and chemical properties of rocks and sediments found there. Sediment is matter that settles at the bottom of a lake, river or ocean.

Various geological research projects have been carried out by the JOIDES Resolution. Resolution is an international research vessel. It drills into the seafloor and collects samples. This research assists scientists in understanding Earth's climate from the distant past. It also helps predict how changes in the climate will affect the ocean's future.

Chemical Oceanography

Chemical oceanographers study the chemistry of seawater. They aim to understand its effects on marine organisms. They also study its interactions with the atmosphere and seafloor. Chemical oceanographers study how the carbon from carbon dioxide is buried in the seafloor. This work highlights the key role the ocean plays in controlling the amount of carbon dioxide. Carbon dioxide is a greenhouse gas in the atmosphere. It contributes to global warming. Chemical oceanographers also study how pollution affects seawater.

Ocean acidification is another important topic in chemical oceanography. The ocean is becoming more acidic. This change is due to the increased amount of carbon dioxide in the atmosphere and oceans. Some of the carbon dioxide creates acid when it mixes with the ocean water. Acid has a negative effect on the growth of shellfish and corals.

The Pacific Northwest region of the United States has a large shellfish population. The number of shellfish has dropped because of ocean acidification. Chemical oceanographers help shellfish growers take care of these animals, and they hope to find ways to reduce the effects of ocean acidification.

Fast Facts:

Limnology

Oceanography is the study of marine environments and their impact on the surrounding area. Limnology is the study of freshwater environments, like lakes.

Oceanographers Are In Demand

The U.S. Bureau of Labor Statistics is a government group that studies job trends. It says job opportunities for oceanographers are expected to grow by 14 percent over the next 10 years. The need for energy and environmental protection will create more jobs in the field.

URL: <https://www.nationalgeographic.org/encyclopedia/oceanography/>



Quiz

1 Read the section "Biological Oceanography."

Which sentence from the section shows the goal of most biological oceanographers?

- (A) Marine biologists and scientists who work in fisheries are examples of biological oceanographers.
- (B) These changes may include increased pollution and warming waters.
- (C) The Cetacean Sanctuary Research Project is a marine biology program.
- (D) By analyzing these animals' behavior, oceanographers hope to protect the area's marine life.

2 Read the paragraph from the section "Oceanographers Are In Demand."

The U.S. Bureau of Labor Statistics is a government group that studies job trends. It says job opportunities for oceanographers are expected to grow by 14 percent over the next 10 years. The need for energy and environmental protection will create more jobs in the field.

Which answer choice is an accurate explanation of what this paragraph means?

- (A) The number of oceanographers who are working will go down slightly in the next few years.
- (B) People who are interested in oceanography will have a good chance of getting a job in the future.
- (C) Energy needs will mean that it will be harder to get a job as an oceanographer 10 years from now.
- (D) The U.S. Bureau of Labor Statistics will begin forcing more people to study oceanography in school.

3 Read the selection from the section "Physical Oceanography."

These scientists investigate ocean temperature, waves, tides and currents. They also research the many ways the ocean interacts with Earth's atmosphere. These interactions have a big influence on weather and climate systems.

Which word from the selection helps the reader understand the meaning of "investigate"?

- (A) ocean
- (B) temperature
- (C) research
- (D) interactions

4 Read the selection from the section "Geological Oceanography."

They study the underwater landscape and its changes. They also focus on the physical and chemical properties of rocks and sediments found there.

What is the meaning of the word "properties" as it is used above?

- (A) homes
- (B) riches
- (C) traits
- (D) needs

Climate change raising the oceans, making them warmer, new report says

By Los Angeles Times, adapted by Newsela staff on 10.10.19

Word Count **836**

Level **830L**



Image 1. The town of Pacifica, California, just south of San Francisco, is ground zero for the issue of coastal erosion. On January 20, 2019, the combination of ocean surge and a king tide caused high waves. Some homes and apartment buildings were destroyed. Photo by: Carolyn Cole/Los Angeles Times/TNS

The planet is in hot water. Warmer temperatures are melting ice and heating up oceans. That means trouble for everyone.

A new United Nations (U.N.) report describes the problems warmer oceans will cause. It warns that people must make changes quickly.

Oceans In Trouble

Over the next 100 years, climate change will make the oceans warmer and more acidic, which makes it harder for sea life to thrive. Melting ice sheets will drive up sea levels quickly. Warmer oceans will harm delicate ecosystems. The total number of animals in the sea could drop as much as 15 percent, according to the U.N. Intergovernmental Panel on Climate Change (IPCC) report.

"The oceans and ice are in trouble, so we're all in trouble," said Michael Oppenheimer. He's a climate scientist at Princeton University in New Jersey. Oppenheimer helped write the report.

The report shows how important it is to reduce greenhouse gas emissions in future decades. The effort will determine how much trouble the world faces.

It's "the difference between an unmanageable problem and one that humans can deal with," Oppenheimer said.

A Heavy Cost

Carbon dioxide is a greenhouse gas. It's created by burning fossil fuels, such as coal and oil, for power. When too much carbon is released, the Earth's atmosphere traps more and more heat.

The study on oceans and ice, released September 25, comes close on the heels of the U.N. Climate Action Summit in New York City, which failed to bring about promises from the countries that cause the most pollution. Yet the report highlights just how troublesome delaying action will be.

Thus far, the oceans have been a hero of our warming world. They have soaked up about a quarter of the carbon dioxide humans have pumped into the air since the industrial revolution. This time period is when factories started burning large amounts of coal to create power. The oceans also soaked up 90 percent of the resulting heat.

"But it can't keep up," said Ko Barrett, who studies the oceans for the National Oceanic and Atmospheric Administration. Barrett is also an IPCC leader.

The report shows climate change has already started to alter the chemistry and circulation of the oceans. It also shows its heavy cost on ecosystems in the ocean.

People who live on the coast are already feeling the effects, too. Rising seas are the biggest problem. By 2050, it's expected that billions of people will live on the coasts.

Sea levels have risen in the last 100 years, mostly due to water coming from mountains. Mountain glaciers have been melting. The melting has happened in Alaska. It also happened in the Andes Mountains in South America.

Now, however, large ice sheets in Greenland and Antarctica are melting. It's causing sea levels to rise faster than ever.

Since 2006, sea levels have risen 0.14 inches every year. That's more than twice as fast as the previous 100 years.

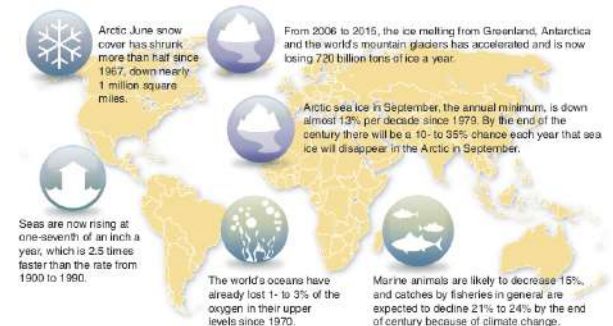
The big question is what happens next.

Rising Seas

New studies have been done since the last IPCC assessment in 2014. The findings caused the authors of this year's study to change their estimates of future sea levels. The new estimates are

Oceans rising faster, ice melting more

Due to climate change, the world's oceans are getting warmer, rising higher, losing oxygen and becoming more acidic at an ever-faster pace and melting even more ice and snow



Source: AP
Graphic: Staff, Tribune News Service

higher.

One estimate showed what could happen if countries lower greenhouse gases quickly. Compared to 2000, sea levels will increase about 1 1/2 feet by 2100. The levels would rise 3 feet by 2300.

That will present many challenges. However, Oppenheimer said the changes would happen more slowly. It would give people more time to plan.

Another estimate shows what happens if countries fail to curb emissions soon. This estimate showed a sea level rise of about 3 feet by 2100. The sea level would rise much more after that.

In the worst-case situation parts of the Antarctic ice sheet start to break apart. The sea level could rise as much as 17 feet by 2300. That would probably be too fast for people to adjust, Oppenheimer said.

Regine Hock studies glaciers at the University of Alaska. She helped write the U.N. report. Hock said there are signs that melting ice will cause many rapid changes.

Rising sea levels will cause problems on the coasts. People living on the ocean will face increasingly destructive flooding during storms and high tides.

By 2050, the level of flooding that happened every 100 years will happen every year, the report said. The study also said hurricanes will become worse.

Fish Populations

The assessment also looked at how climate change is affecting fish populations. Warming waters have put many fish and other sea life on the move. Some sea life can't relocate, though. Corals, for example, could be lost.

The report authors called on governments to protect ecosystems. It emphasized the need to slash greenhouse gas emissions.

"What's at stake is the health of ecosystems," Barrett said. "And — importantly — the world we leave our children."

Quiz

1 Read the following statements.

1. *Climate change is causing sea levels to rise.*
2. *Countries must take action to address climate change.*
3. *Climate change is caused by greenhouse gas emissions.*
4. *Warming waters have forced fish and other sea life to find new homes.*

Which two statements are main ideas of the article?

- (A) 1 and 2
- (B) 1 and 3
- (C) 2 and 4
- (D) 3 and 4

2 Read the paragraph from the section "Oceans In Trouble."

Over the next 100 years, climate change will make the oceans warmer and more acidic, which makes it harder for sea life to thrive. Melting ice sheets will drive up sea levels quickly. Warmer oceans will harm delicate ecosystems. The total number of animals in the sea could drop as much as 15 percent, according to the U.N. Intergovernmental Panel on Climate Change (IPCC) report.

Which statement summarizes the paragraph?

- (A) Ocean ecosystems are delicate and easily damaged.
- (B) The U.N. met to discuss climate change in New York City.
- (C) Rising temperatures could negatively affect ocean ecosystems.
- (D) Rising sea levels are causing climate change to get worse.

3 According to the section "Rising Seas," how can countries prevent sea levels from rising drastically?

- (A) They need to lower greenhouse gas emissions quickly.
- (B) They need to prevent people from moving to the coasts.
- (C) They need to prepare for more hurricanes and flooding.
- (D) They need to replace melted glaciers with frozen ones.

4 What is the relationship between climate change and ice sheets in Greenland and Antarctica?

- (A) Climate change is causing the ice sheets to form new glaciers.
- (B) Climate change is causing the ice sheets to float to new locations.
- (C) Climate change is causing the ice sheets to freeze in different shapes.
- (D) Climate change is causing the ice sheets to melt and affect sea levels.

The Great Pacific Garbage Patch counts 1.8 trillion pieces of trash

By Amina Khan, Los Angeles Times, adapted by Newsela staff on 04.02.18

Word Count **775**

Level **MAX**



Image 1. A piece of floating debris snagged during an ocean sampling operation. Photo from Ocean Cleanup/TNS.

The Great Pacific Garbage Patch is getting greater. Twice the size of Texas, the floating mass is up to 16 times larger than previously thought. According to scientists who performed an aerial survey, it is carrying about 79,000 metric tons of plastic.

The discovery was published in the journal *Scientific Reports*. The study reveals that this plastic blight in the Pacific Ocean is still growing at what the researchers called an "exponential" pace.

The Great Pacific Garbage Patch, or GPGP for short, is an accumulation of plastic products. It is found in the eastern Pacific Ocean. This is between California and Hawaii. Much of it is hidden from the naked eye, partly because some of the plastic has been broken down into smaller and smaller bits over time. (It is not, as its name may suggest, an island.) The concentration of floating plastic in the patch ranges from tens to hundreds of kilograms per square kilometer.

"It's quite frightening because we are so far from any mainland or island," said Laurent Lebreton. He led the study. He is also an oceanographer with the Ocean Cleanup Foundation based in the

Netherlands. Out in the blue seas, the plastic is a jarring reminder of human impact.

The GPGP is just one of many large garbage patches in the ocean. Humans manufacturing and quickly discarding plastic products has caused the garbage patches to grow. Plastics are meant to last, and that's great for carrying your groceries in thin bags or holding a six-pack. It's not so great when those plastics end up in the guts of sea turtles or strangle birds. Recent studies show that biofouled plastic can attract fish and seabirds and end up in the food chain. The full effects of this aren't yet known. Scientists worry that this can lead to malnutrition and other problems, though. Large or small, plastics of all sizes can harm ocean life.

Researchers have tried to get a handle on how big of a problem the GPGP is. By dragging nets through parts of the patch, they are sampling the plastic they find. But this only gives a partial view. For one thing, even a team of boats can only see so much. For another, the net samplers they use are often too small to catch larger debris.

Lebreton and his colleagues decided to take a bird's-eye view. They conducted aerial surveys of the patch while also sending boats to sample the debris. They brought it all back to shore for analysis.

The researchers split the plastic they collected into four groups, from super tiny (microplastic) to large (megaplastic). Microplastics made up 94 percent of the estimated 1.8 trillion pieces of trash in the patch. But they only accounted for 8 percent of the total mass. More than three-quarters of the 79,000 metric tons of junk actually came from larger plastics.



Part of the reason that larger plastics outweighed the other categories lay in all the fishing nets that accounted for 46 percent of the garbage patch's mass. Fishing nets are made to be durable, which is great for catching fish. But that durability is not great when they're lost or abandoned. Since they're fairly cheap and easy to replace, those nets can then float through the ocean. The nets end up entangling and killing animals in their path.

Fifty plastic items had readable production dates: One from 1977, seven from the 1980s, 17 from the 1990s, 24 from the 2000s and one from 2010. (This doesn't mean that they were in the water that whole time, Lebreton was quick to point out. Some 386 pieces had words from nine different languages. A third of them were in Japanese and a third were in Chinese.)

The researchers think the patch may have grown in recent years in part because of the 2011 Tohoku tsunami, which reportedly washed 4.5 million metric tons of debris into the sea instantly. About 1.4 million of that could have been moved across the ocean surface.

The plastic that lived in the patch also shared certain characteristics, such as a small surface-to-volume ratio. Plastics with high surface-to-volume ratios, such as sheets and films, were probably biofouled or broken down into smaller fragments that did make it into the patch.

None of this, of course, counts all the plastics that may have sunk to the bottom of the ocean. "Levels of plastic pollution in deep water layers and the seafloor below the GPGP remain unknown," the study authors wrote.



Quiz

- 1 Read the first three paragraphs of the article.
- Select the sentence that BEST supports the conclusion that the Great Pacific Garbage Patch is rapidly becoming larger.
- (A) Twice the size of Texas, the floating mass is up to 16 times larger than previously thought.
 - (B) According to scientists who performed an aerial survey, it is carrying about 79,000 metric tons of plastic.
 - (C) The study reveals that this plastic blight in the Pacific Ocean is still growing at what the researchers called an "exponential" pace.
 - (D) The concentration of floating plastic in the patch ranges from tens to hundreds of kilograms per square kilometer.

- 2 Which piece of evidence BEST explains why trash has accumulated in the ocean?
- (A) Humans manufacturing and quickly discarding plastic products has caused the garbage patches to grow.
 - (B) Recent studies show that biofouled plastic can attract fish and seabirds and end up in the food chain.
 - (C) Since they're fairly cheap and easy to replace, those nets can then float through the ocean.
 - (D) None of this, of course, counts all the plastics that may have sunk to the bottom of the ocean.

- 3 Which answer choice accurately characterizes Laurent Lebreton's reaction to the Great Pacific Garbage Patch?
- (A) He is committed to getting rid of all of the plastic floating in the patch.
 - (B) He is trying to conduct more aerial surveys of the patch to see how it spreads.
 - (C) He is curious about how the patch might extend into deeper water layers and the seafloor.
 - (D) He is concerned about the large impact the patch can have on the environment.

- 4 Read the paragraph below:

The researchers think the patch may have grown in recent years in part because of the 2011 Tohoku tsunami, which reportedly washed 4.5 million metric tons of debris into the sea instantly. About 1.4 million of that could have been moved across the ocean surface.

WHY did the author include this paragraph?

- (A) to highlight the damage caused by a recent tsunami
- (B) to explain how trash is easily moved across the ocean
- (C) to illustrate the need for the trash in the patch to be cleaned up and disposed of
- (D) to present a theory about what caused the patch to gain even more mass