

# ENVIRONMENTAL INFLUENCE ON TRAITS

differentiated passages



**Polar Bears in Trouble Questions**

The article discusses environmental factors that impact the traits of polar bears. Fill in the relationships below.

| Factors         | Variation in Traits (Effect)                   |
|-----------------|--|
| Global warming. | 1. Polar bears have less sea ice to travel on. |
|                 | 2. Polar bears produce less offspring.         |

Choose one effect that an environmental factor impacts. Reread the cause-and-effect chain to show the impact of melting ice on polar bears.

→  →  →

Identify environmental factors that might impact polar bears. How do these factors impact polar bear traits? List the environmental factors that might impact polar bears. How do these factors impact polar bear traits? List the environmental factors that might impact polar bears. How do these factors impact polar bear traits?

510L

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Polar Bears in Trouble

Climate change is a problem. Humans are causing climate change. Changes in the environment make it hard for wildlife to adapt. Scientists have even seen changes in some animals' genes. This causes problems for those animals.

The polar bear is an example. Polar bears live in the Arctic. They live in a cold climate. They need sea ice to travel. They need seals to eat. Global warming melts the ice. Polar bears spend more time on land. They are away from their food. They can starve. A lack of food makes mother polar bears unhealthy. These mothers may not be able to feed their cubs. They will have fewer cubs. The populations shrink.



There are other problems for polar bears. Polar bears in Norway showed a loss in genetic diversity. Melting sea ice is shrinking the polar bears' habitat. There were fewer polar bears to breed. The next generations might not be as healthy.

What can we do to help polar bears? We can use solar and wind energy. They don't cause global warming. "Adopting" polar bears can help. This gives money for studying the effects of climate change.

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3rd Grade NGSS 3-LS3-2

# ABOUT LEXILE LEVELS



MagiCore Learning, LLC is a certified Lexile® Partner. These texts are officially measured and approved by Lexile and MetaMetrics® to ensure appropriate rigor and differentiation for students.

The Lexile Framework® for Reading measures are scientific, quantitative text levels. When the Lexile of a text is measured, specific, measurable attributes of the text are considered, including, but not limited to, word frequency, sentence length, and text cohesion. These are difficult attributes for humans to evaluate, so a computer measures them.

Common Core State Standards uses Lexile level bands as one measure of text complexity. Text complexity ranges ensure students are college and career ready by the end of 12<sup>th</sup> grade. Lexile measures help educators scaffold and differentiate instruction as well as monitor reading growth.

| Grade Band | Lexile® Bands Aligned to Common Core Expectations |
|------------|---|
| K-1        | N/A   |
| 2-3        | 420L-820L   |
| 4-5        | 740L-1010L  |
| 6-8        | 1185L-1385L                                       |

Keep in mind when using any leveled text that many students will need scaffolding and support to reach text at the high end of their grade band. According to Appendix A of the Common Core Standards, "It is important to recognize that scaffolding often is entirely appropriate. The expectation that scaffolding will occur with particularly challenging texts is built into the Standards' grade-by-grade text complexity expectations, for example. The general movement, however, should be toward decreasing scaffolding and increasing independence both within and across the text complexity bands defined in the Standards."



# Environmental Influence on Traits

3rd grade

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Each passage set includes two differentiated passages on a third-grade level (one at the beginning of the band, one towards the end) and a question set geared towards comprehension and science mastery. The first question is differentiated to include a fill-in-the-blank diagram (lower complexity) or an open-ended diagram (higher complexity).



# How to Use This Resource

This resource was created with the NGSS Science Standards in mind. It includes six differentiated passages aligned to the following standard:

## ***3-LS3-2: Environmental Influence on Traits***

Use evidence to support the explanation that traits can be influenced by the environment.  
(Cause and Effect)

**Clarification Statement:** Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and a pet dog that is given too much food and little exercise may become overweight.

**Here are some suggestions for using these passages:**

- Use as independent work after you have taught an overview of this standard. Assign the different levels based on the passage students can read and comprehend independently.
- Use as a reading center to reinforce key comprehension and science concepts at the same time!
- Use as a homework or review packet.
- Use as an intervention for students who need to revisit science concepts.



# Polar Bears in Trouble

Climate change is a problem. Humans are causing climate change. Changes in the environment make it hard for wildlife to **adapt**. Scientists have even seen changes in some animals' genes. This **causes** problems for those animals.

The polar bear is an example. Polar bears live in the Arctic. They live in a cold climate. They need sea ice to travel. They need seals to eat. Global warming melts the ice. Polar bears spend more time on land. They are away from their food. They can starve. A lack of food makes mother polar bears unhealthy. These mothers may not be able to feed their cubs. They will have fewer cubs. The populations shrink.



There are other problems for polar bears. Polar bears in Norway showed a loss in **genetic diversity**. Melting sea ice is shrinking the polar bears' **habitat**. There were fewer polar bears to breed. The next **generations** might not be as healthy.

We can help polar bears. We can use solar and wind energy. They don't cause global warming. "Adopting" polar bears can help. This gives money for studying the effects of climate change.

# Polar Bears in Trouble Questions

1. The article lists two environmental factors that impact the traits of polar bears. Fill cause and effect relationships below.

| Environmental Factors<br>(Cause)                | Variation in Traits<br>(Effect)        |
|---|--|
| 1. Arctic ice is melting due to global warming. | 1.                                     |
| 2.  | 2. Polar bears produce less offspring. |

2. Oftentimes, there is more than one effect that an environmental factor impacts. Reread the passage and fill in the cause-and-effect chain to show the impact of melting ice on polar bears.



3. Chose one of the following environmental factors that might impact polar bears. How might this factor cause a change in polar bear traits?

- Polar bears are exposed to toxic chemicals in their food.
- Humans develop oil in the Arctic.

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## Polar Bears in Trouble

Climate change is happening. Human activity is mostly to blame. Earth is warming at an alarming rate due to all the carbon dioxide in its atmosphere. This extra carbon dioxide comes from fossil fuels. Changes in weather patterns and the environment make it difficult for wildlife to **adapt**. Scientists have even seen changes in some animals' **genes**. This could **cause** trouble for those animal populations.

Take the polar bear, for example. Polar bears live in the Arctic. They survive in cold climates. Lots of sea ice to travel on and seals to eat are important to them. With ice melting because of global warming, polar bears spend more time on land. More time on land means they are away from their major food source.



Starvation is a real possibility. A lack of food creates mother polar bears that are unhealthy. These females may not be able to produce milk for their cubs. If polar bears stop having babies, the population will grow smaller.

The problems aren't limited to food troubles, though. Global warming changes **genetic** information. A study of polar bears in Norway showed the animals had a 10% loss in **genetic diversity**. Melting sea ice made the polar bears' natural **habitat** shrink. Polar bears in a smaller area mean there are fewer mating options. When closely related polar bears breed, this affects the health of the next **generations**. Traits that were **recessive**, or hidden, could be revealed. Inherited illnesses or an inability to produce **offspring** may be the result.

It's not too late to help wildlife. For example, we can switch to **renewable energy** such as solar and wind instead of using fossil fuels. "Adopting" endangered animals through wildlife organizations is another way to help. It provides money for more research into climate change and its effects.

# Polar Bears in Trouble Questions

1. The article lists two environmental factors that impact the traits of polar bears. Fill cause and effect relationships below.

| Environmental Factors<br>(Cause) | Variation in Traits<br>(Effect) |
|----------------------------------|---------------------------------|
| 1.                               | 1.                              |
| 2.                               | 2.                              |

2. Oftentimes, there is more than one effect that an environmental factor impacts. Reread the passage and fill in the cause-and-effect chain to show the impact of melting ice on polar bears.



3. Chose one of the following environmental factors that might impact polar bears. How might this factor cause a change in polar bear traits?

- Polar bears are exposed to toxic chemicals in their food.
- Humans develop oil in the Arctic.

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## Rescuing Rice

Many people around the world enjoy eating rice. It's quick to cook and a healthy food choice. Growing rice, however, is not as easy. Most rice is grown in fields known as paddies. These paddies are typically filled with about 10 centimeters of water. It's important to keep the water level consistent. If it gets too high or too low, disaster can strike the rice crop.

Unfortunately, global warming is harming rice. Changes in weather patterns cause **droughts** and floods. A drought is when there is little rainfall. This causes crops to not get the water they need. Floods, on the other hand, mean too much **precipitation**. The **effects** are poor development and less production of rice overall.



Water isn't the only problem. Hot days and cooler nights are the best conditions for growing rice. Temperatures, however, are warming up around the globe due to climate change. Rice plants are **vulnerable** to heat stress during their growth cycles. Extreme heat can mean the destruction of rice crops. With higher temperatures, the risk of disease in the rice plants also increases.



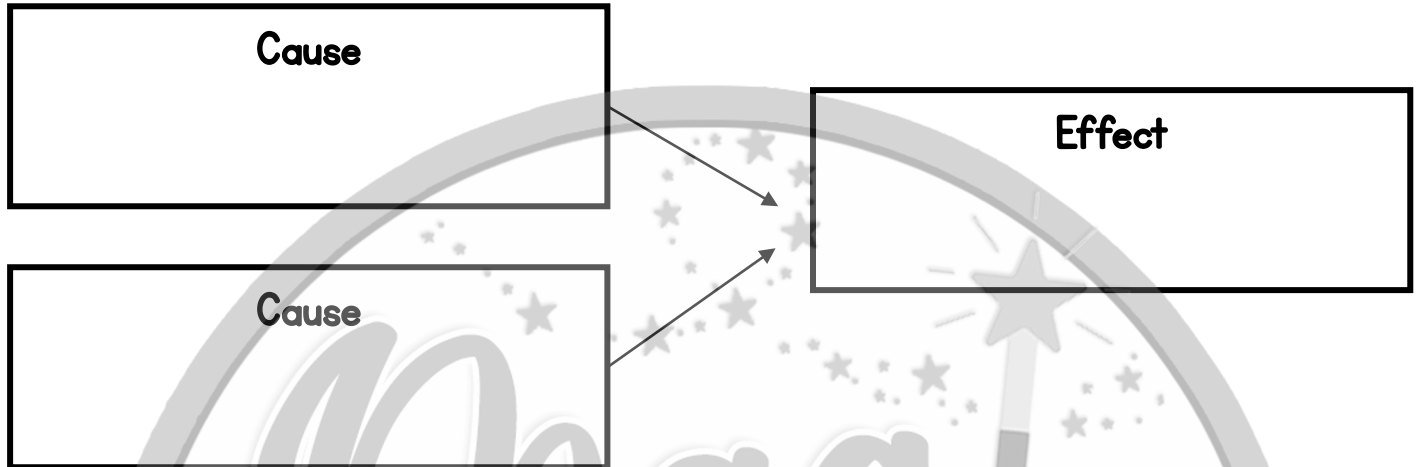
Humans are trying to help rice crops survive. New **irrigation** methods for rice paddies have been tested with some hope. An even more interesting solution involves scientists working with rice **genes**. Rather than controlling the growing **environment** for the rice, scientists are **experimenting** with changing the rice itself. They are breeding new forms of rice plants. They use various rice seeds from around the globe to do this. Combining the **genetic** material from different rice seeds can create sturdier rice plants.

These new **breeds** can withstand droughts and floods. Scientists try new mixes then **analyze** the results. One gene, in particular, helps rice live during long periods with too much water. Rice plants made with this gene, called “scuba rice,” can live for two weeks underwater. This is great news for farmers growing rice in areas that often flood.

More genetic study needs to be done. New combinations of genes could be discovered. Producing rice plants that **inherit** traits to make them survivors will benefit everyone.

# Rescuing Rice Questions

1. The article lists some ways global warming affects the traits of rice. Fill in the chart to show these effects.



2. How can scientists change the genetics of rice to make tougher plants? What traits would be desirable?

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3. Describe what effect the following environmental factor might have on rice:

a. There is half the amount of annual rainfall this year.

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## Do You Smell That?



Different **species** of fish fill bodies of water on Earth. Human activity, however, often **pollutes** these waterways. Metals are among the many **pollutants** humans put into the water. These metals, such as copper and nickel, are causing harmful effects on fish.

Fish use their sense of smell for three main reasons. The first is to find food. Smell guides them to the right things to eat. Fish also use smell to locate mates so they can reproduce. Finally, fish use their sense of smell to avoid **predators**. Fish are losing the important trait of being able to smell in waters with metals in them. The metals trigger the shutdown of this sense to protect the fish's brain.

An **environment** that causes fish to lose their sense of smell is dangerous. Not being able to find food leads to weight loss or starvation. Being without mates means new fish aren't being born. Becoming easy **prey** for other animals causes a decrease in the number of fish as well. All of this upsets the marine **ecosystem**. It can also lead to some fish becoming **endangered species**.

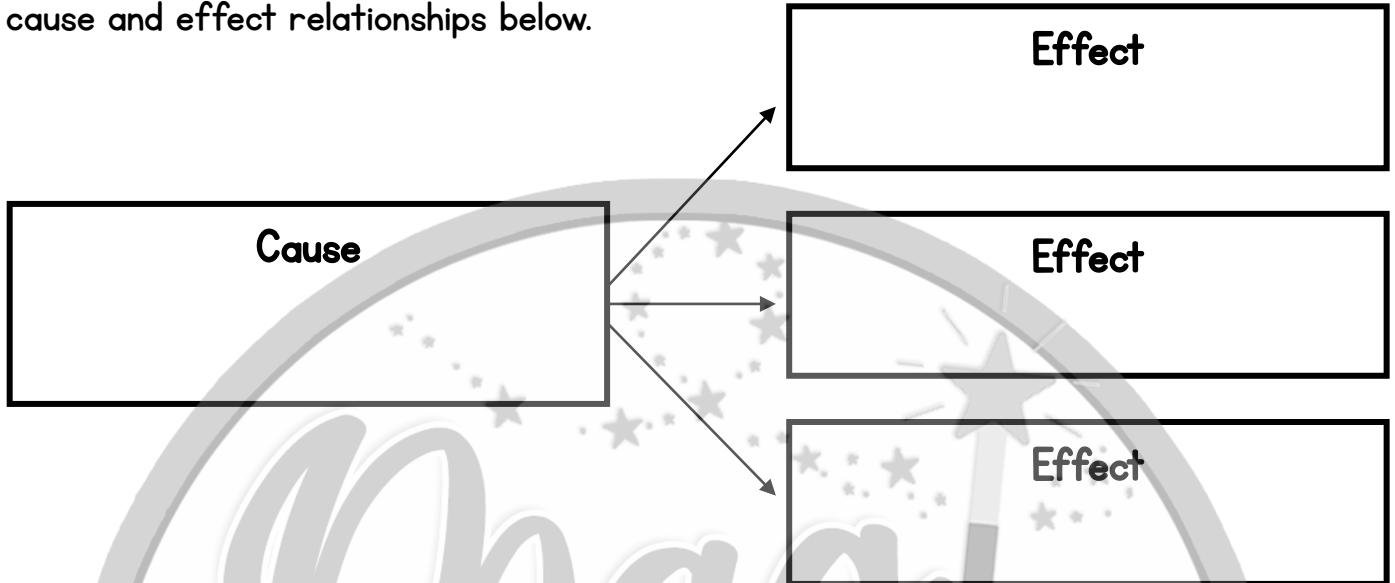
The good news is that scientists have been **experimenting**. They have worked with fish in water polluted with metals. Researchers have studied a type of fish called yellow perch. These fish have been living in lakes **contaminated** with metals such as mercury, nickel, and copper. Scientists then put the yellow perch into cleaner water. They observed the results. The ability to smell returned to these fish within 24 hours. The inherited trait of smelling was shut off in polluted water. It was turned back on in clean water. This shows that efforts to rid water of pollution are important to preserving marine **organisms**.





# Adapting to Wildfire Questions

1. The article lists the ways the environmental factor of water pollution affects fish. Fill cause and effect relationships below.



2. All of these effects on fish can cause an overall effect on the fish population. If the 3 effects described above happen, what could happen to the fish population?

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3. The scientists have tested the effect of moving the fish to cleaner water on their sense of smell. What is something else they could test the effects of to learn more about fish and their survival in water with pollution?

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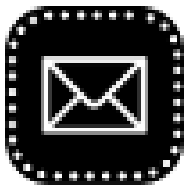
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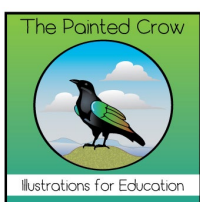
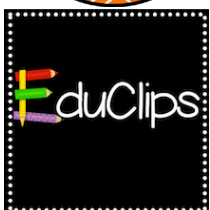
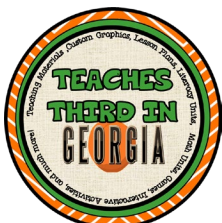
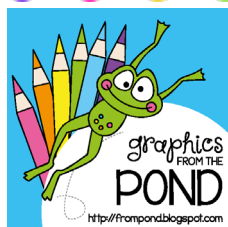


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