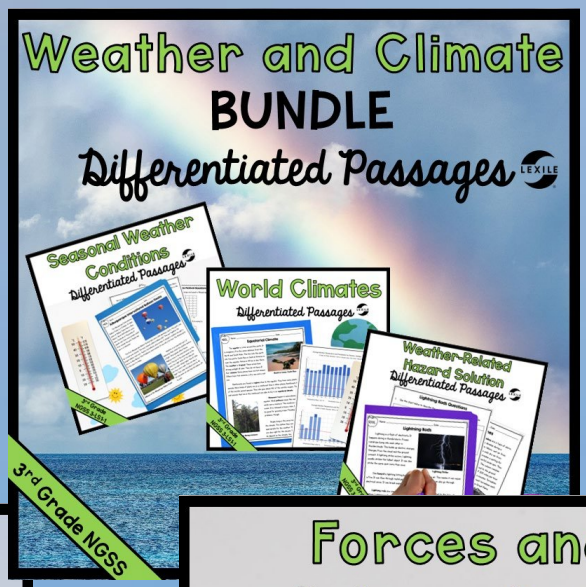
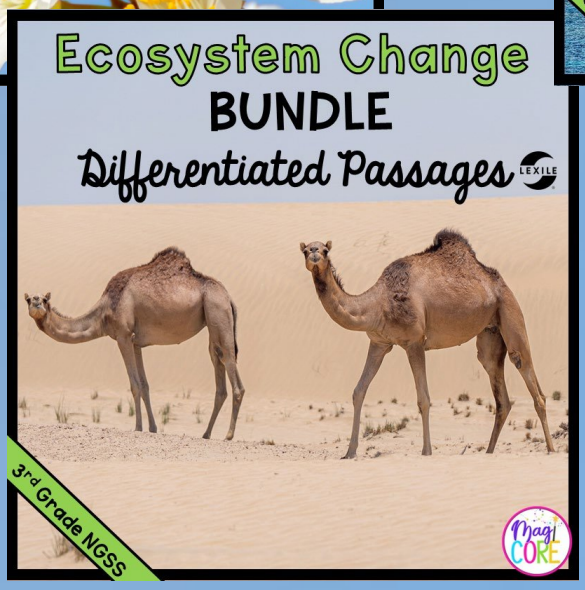
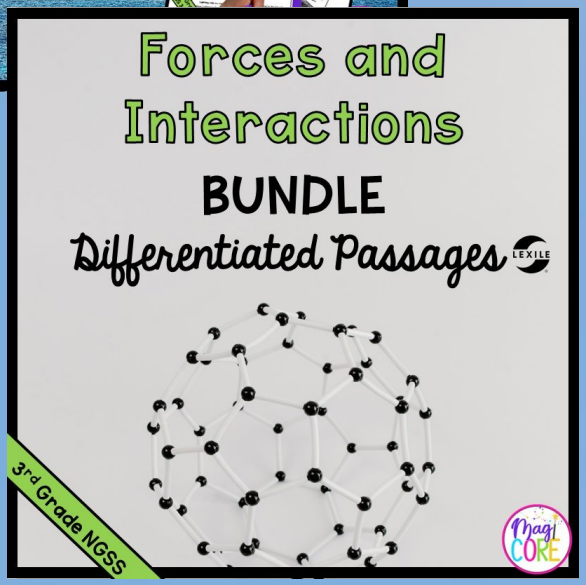
3rd Grade Science Bundle

Differentiated Passages









3rd Grade NGSS

ABOUT LEXILE LEVELS

MagiCore 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 12th 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."

Animal Groups

3rd grade

Table of Contents

1. How to Use This Resource
2. Elephant Herds (530L, 790L)
3. Dolphin Pods (490L, 790L)
4. A Shrewdness of Great Apes (520L, 820L)
5. Wolf Packs (490L, 760L)
6. Ant Colonies (530L, 790L)
7. Penguin Colonies (520L, 770L)

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-LS2-1: Animal Groups

Construct an argument that some animals form groups that help members survive. (Cause and Effect)

Clarification Statement: None.

Assessment Boundary: None.

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.

530L

Name: _____ Date: _____

Elephant Herds

The largest living land animal is the elephant. They live in forests and grasslands. Elephants travel in small family groups. These groups have 2-8 elephants in them. They are led by a female. This female is called the **matriarch**. The groups have females and young elephants. A herd is formed when these smaller groups join together.



A herd of elephants traveling.

Herds have many purposes. **Members** of the herd help raise babies. Females only give birth to one calf at a time. Each one is important. This is because elephants are **endangered**. Humans have destroyed many elephant habitats. They have killed elephants. Humans kill them to take their ivory tusks. Every elephant that is born keeps this **species** alive. The herd works together to care for baby elephants. This gives them a better chance of becoming adults.



A baby elephant and its mother.

Elephant herds are true families. The elephants talk to each other. They use calls and rumbles. They also support each other. Members of the herd will help injured elephants. The herd will also slow down for older members. They will slow down if one is injured. The herd is sad when a member dies.

©Julia Barbosa



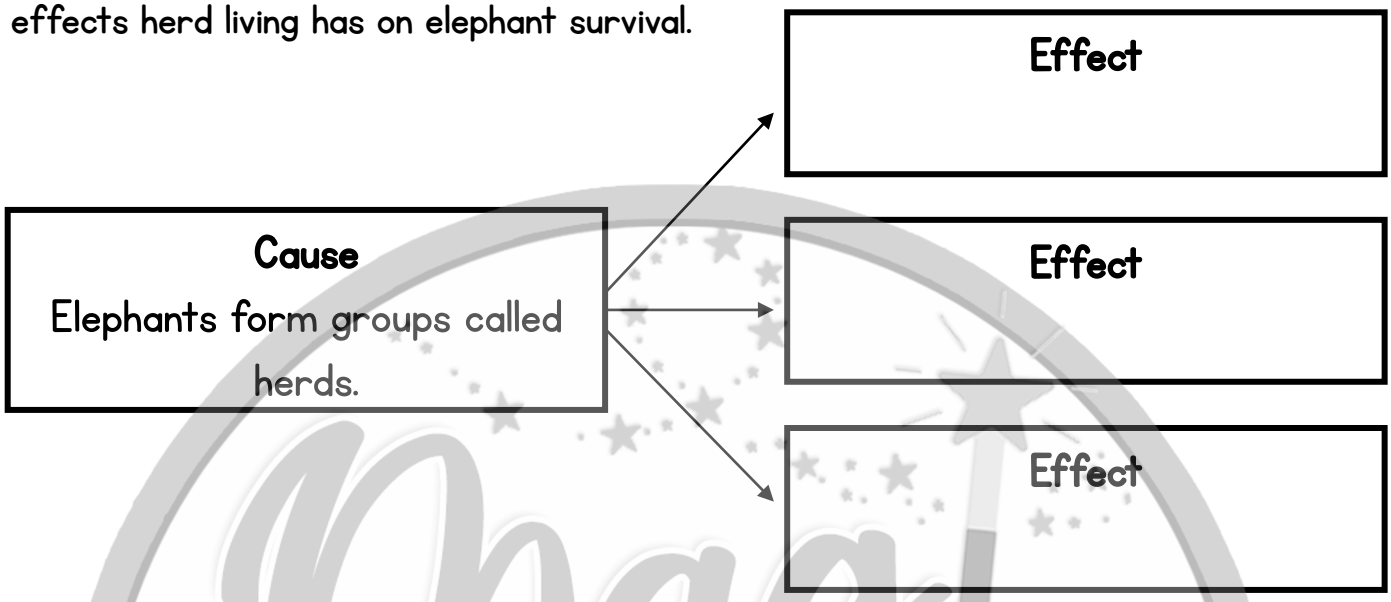
A herd protects elephants. Herds keep other animals from attacking. A main goal of the herd is sensing predators. Elephants would be less likely to survive without the safety of the herd.

Male elephants don't form herds. Young male elephants are normally alone. Researchers have seen males forming all-male herds, though. This behavior is thought to be an **adaptation**. The young males travel deeper into human lands. They go here in search of food. They use the herd to protect themselves. This shows how adaptable elephants are to **environmental change**.

©Julia Bochoso

Elephant Herds Questions

1. Living in a herd has many effects on elephant survival. Fill in the chart below to show the effects herd living has on elephant survival.



2. The reasons male elephants have begun living together are different than a typical herd. Explain the differences between an elephant herd and male elephants living together.

Give 2 reasons scientists could use to argue that elephants survive better in groups. Explain how these reasons help them survive.

Reason 1: _____

Reason 2: _____

Explain: _____

©Julia Bochoso

490L

Name: _____ Date: _____

Wolf Packs



Wolves are part of the **canine** family. Dogs, foxes, and coyotes are also canines. Wolves live in groups. The groups are called **packs**. These groups usually have 7-8 wolves. They include parents and offspring. Packs help wolves raise pups, hunt for food, and protect themselves.

All the wolves in a pack help care for pups. Members get food when the pups are very small. The mother does not get food. She stays in the **den** with the pups. Older wolves in the pack take turns bringing pups food. They play with them. They also watch over them. The pups learn how to survive from the adult wolves. They also play with other pups. All this play is practice for hunting. It also teaches pups how to **interact** with other wolves.



Wolves surrounding a bison.

Hunting is much easier in a wolf pack. A pack helps when going after large prey. First, the pack will spread out. Then, members surround the target. Some pack members attack from the rear. Others approach from the front. They work together. The wolves are more likely to be successful in getting food for the pack.

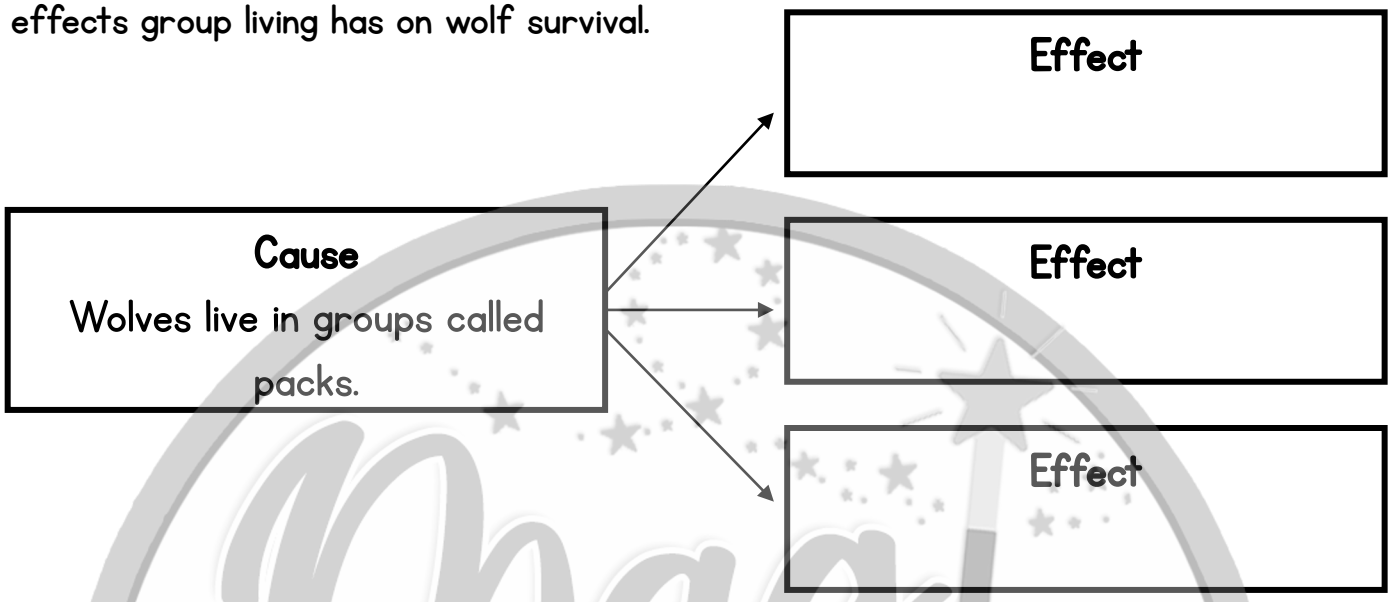
Male wolves **specialize** in protecting their packs. They fight off **rivals**. Teamwork helps wolves keep the members of their packs safe.

Wolf packs have many benefits for their members. Wolves do not want to live alone. They succeed by cooperating and struggle when alone.

©Julie Bachose

Wolf Packs Questions

1. Living in a group has many effects on wolf survival. Fill in the chart below to show the effects group living has on wolf survival.



2. Who helps take care of wolf pups in the pack? Describe their roles and what they do.

---

3. Give 2 reasons scientists could use to argue that wolves survive better in groups. Explain how these reasons help them survive.

Reason 1: _____

Reason 2: _____

Explain: _____

©Julia Bochoso

Environmental Influence on Traits

3rd grade

Table of Contents

1. How to Use This Resource
2. Polar Bears in Trouble (510L, 820L)
3. City Coyotes (490L, 790L)
4. Rescuing Rice (480L, 810L)
5. Thirsty Corn (500L, 800L)
6. Adapting to Wildfire (490L, 810L)
7. Do You Smell That? (490L, 770L)

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: Environnemental 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.

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.

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.

©Julia Bochoso

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 (Cause)	Variation in Traits (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.

©Julia Bochoso

810L

Name: _____ Date: _____

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.

©Julie Bachose



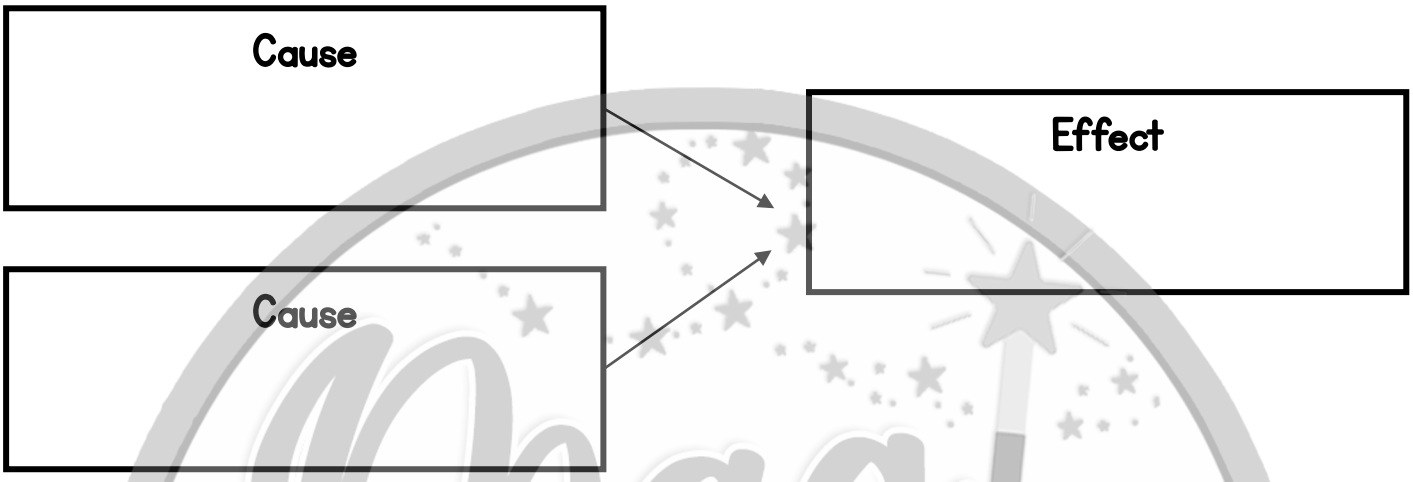
Humans are trying to help rice crops survive. New **irrigation** methods for rice paddies have been tested with some hope. An even more interesting solution involves scientists working with rice **genes**. Rather than controlling the growing **environment** for the rice, scientists are **experimenting** 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.

©Julia Bacheso

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?

---

3. Describe what effect the following environmental factor might have on rice:
   a. There is half the amount of annual rainfall this year.

©Julia Bochoso

Environmental Change Solution

3rd grade

Table of Contents

1. How to Use This Resource
2. Safe Passage (520L, 800L)
3. In Search of Water (520L, 810L)
4. A Salmon Road Trip (510L, 760L)
5. Shady Chocolate (490L, 790L)
6. Welcome Back, Wolves (520L, 790L)
7. Oil Spill Clean-Ups (530L, 790L)

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 seven differentiated passages aligned to the following standard:

3-LS4-4 Environmental Change Solution

Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change. (Systems and System Models)

Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.

Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.

Here are some suggestions for using these passages:

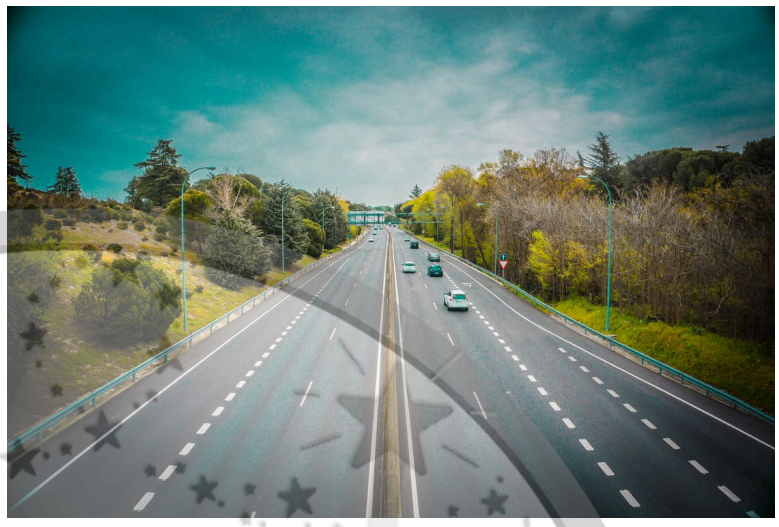
- Use as independent work after you have taught an overview of this standard. Assign the different levels based on the passage students can read and comprehend independently.
- Use as a reading center to reinforce key comprehension and science concepts at the same time!
- Use as a homework or review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

520L

Name: _____ Date: _____

Safe Passage

The Cascades are mountains. They run from California through Oregon and Washington. They end in British Columbia, Canada. This mountain range has forests, slopes, and lakes. Many different **organisms** live in these mountains. Gray wolves and deer are a few **mammals** in the Cascades. Fish and reptiles are part of this **ecosystem**. Birds and insects also live there.



Highway animals cannot cross.

People live in the Cascades, too. They travel through the area. One major highway is Interstate 90, or I-90. This highway cuts across the Cascades. It carries over 28,000 cars a day. I-90 causes a problem. Its location affects wildlife movement in the Cascades. It stops safe **migration**. Accidents happen when animals cross the highway. Animals and people die in these crashes.



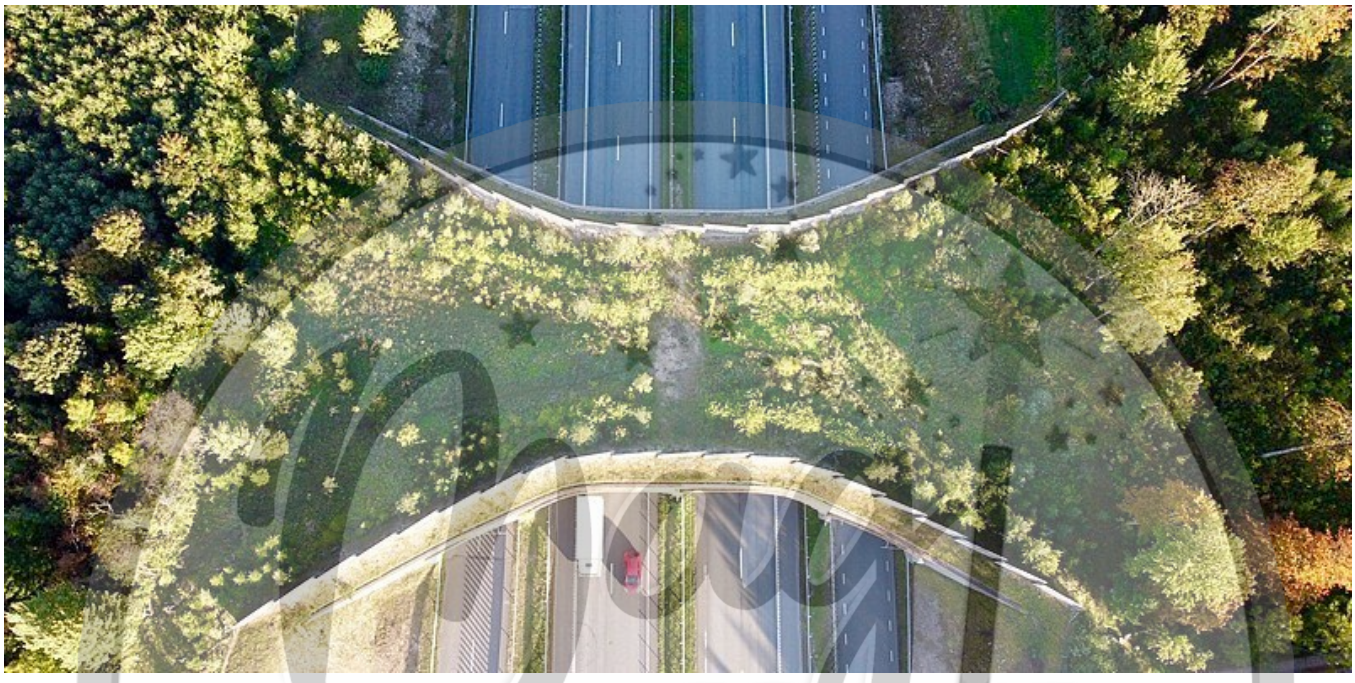
Example of a wildlife bridge in Canada.

I-90 has other effects, too. It blocks animal movement. This makes finding food hard. I-90 also makes finding new mates tricky. The animals won't be reproducing as much. Their numbers could decrease. I-90 is a danger to animal **survival**.

Builders have made wildlife bridges to solve the problem. Some of

©Julia Bochoso

these bridges are built over highways. This keeps animals out of traffic. One wildlife overcrossing is near Snoqualmie Pass in Washington. This bridge looks natural to animals. It has dirt and plants. High walls protect animals. Fences along the highway guide animals to the overpass.



Aerial view of a wildlife bridge.

Below the bridge are two arches for cars to drive under. The bridge costs over $6 million. It's doing its job. Many species have been seen crossing I-90 without harm. It didn't take them long to figure out how the bridge worked either. Coyotes and elk are some of the animals using the bridge. Many animals in the Cascades are able to live in this **environment** without danger from the highway.

Wildlife bridges are one **solution.** The only problem has been humans entering these bridges that are for wildlife. Humans on the bridges may stop animals from using them. Signs have been posted. They ask people to stay out. The bridges are also being watched.

©Julia Bachosa

Safe Passage Questions

1. Use the chart below to describe the problem and solution described in the article.

Problem	Solution
Interstate 90 carries 28,000 cars daily through the Cascade Mountains. This puts animals and humans at risk from accidents.	

2. Describe the problem the interstate has caused in the Cascades mountains in more detail.

---

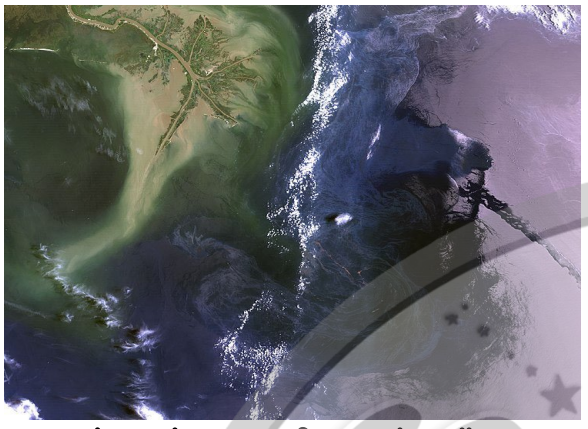
3. Is the solution in the article effective at solving the problem? Give reasons from the text to support your answer.

©Julia Bochoso

790L

Name: _____ Date: _____

Oil Spill Clean-Ups



Aerial view of an oil spill.

Thousands of oil spills happen in the United States every year. Most spills are small, but they still have bad effects on the environment. Large oil spills are considered **disasters**. They are caused in a number of ways. Oil pipelines break. Big ships carrying oil sink. Drilling for oil sometimes goes wrong. **Environmental changes** caused by an oil spill can linger for years after it happens. Beach and wetland habitats are the most common environments affected by oil spills.

When oil spills into an environment, plants and animals are affected. Oil coats bird wings and then birds can't fly. Nesting grounds are destroyed by oil spills. Sea otter fur loses its **insulating** qualities when covered with oil. The otters can't stay warm in colder water. Fish eggs can't survive when they come into contact with oil. Blowholes of whales and dolphins become clogged with oil. This makes breathing impossible. Oil has **toxic** substances that kill plants and animals.

One of the biggest oil spills in U.S. history was the *Deepwater Horizon* spill. This occurred on April 20, 2010. An explosion happened aboard a drilling platform in the Gulf of Mexico. The oil **rig** sank two days later. About 134 million gallons of oil leaked into the ocean. Thousands of birds, mammals, and sea turtles were slicked with oil. Many of these creatures didn't survive.



Milkweed plant.

©Julie Bochorse

There are a few solutions that have been tried to clean oil spills. None of them remove 100% of the oil, though. One of the more natural solutions involves **milkweed**. This plant is the only source of food for monarch caterpillars. The seed pods of milkweed plants have long **fibers**. These fibers **repel** water. They also help milkweed spread its seeds. It's been discovered, however, that these fibers are remarkable at absorbing oil. They suck up more than four times the oil that other materials can. Some companies have created oil cleanup kits that include milkweed fibers. Each low-cost kit can absorb 53 gallons of oil. A great side benefit is that more milkweed is being planted. This helps monarch butterfly populations whose numbers have been decreasing.

The best solution would be to prevent oil spills. Until that happens, solutions like milkweed kits are a tool against the damage oil spills create.

©Julia Bacharach

Oil Spill Clean-Ups Questions

1. Use the chart below to describe the problem and solution described in the article.

Problem	Solution

2. Describe the problem oil spills cause for the environment. Give at least 2 examples of what has happened or could happen because of this problem.

---

3. Is the solution in the article effective at solving the problem? Give reasons from the text to support your answer.

©Julia Bochoso

Plant and Animal Life Cycles

3rd grade

Table of Contents

1. How to Use This Resource
2. The Life Cycle of a Honeybee (490L, 770L)
3. The Life Cycle of a Bat (470L, 780L)
4. The Life Cycle of a Sea Turtle (500L, 790L)
5. The Life Cycle of a Strawberry (480L, 810L)
6. The Life Cycle of an Apple Tree (490L, 800L)
7. The Life Cycle of a Sunflower (510L, 820L)

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).

490L

Name: _____ Date: _____

The Life Cycle of a Honeybee

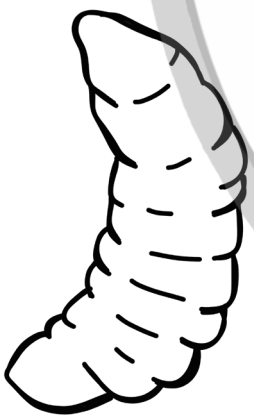


Honeybees have been around for 150 million years. That is much longer than humans! Honeybees help plants. Their life cycle helps the earth.

The life cycle starts with the female queen. The queen mates with the male **drones**. The queen leaves the hive. After, she returns to the **colony**. She lays eggs in the hive.

There are four stages in the honeybee life cycle. The first stage is the egg. The queen lays eggs in the hive. She can lay up to 3,000 eggs per day. The egg is tiny. It is in a cell. On the third day, it falls to its side. Some eggs will be females. Females become worker bees or queens. Males will become drones.





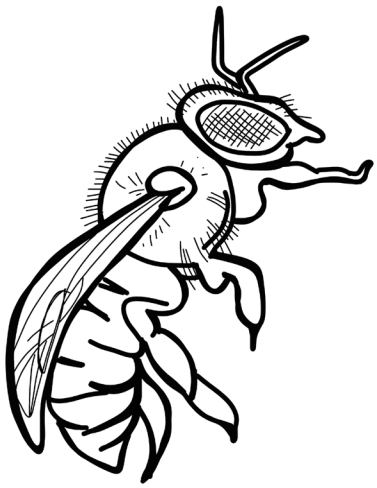
The second stage is the **larva** stage. After three days, the egg grows into a larva. The larva looks like a small, white worm. Young worker nurse bees feed the larva. The nurse bees make a jelly. The larva eats this jelly. The larva will **molt** as it grows. It sheds its skin. The egg cell is covered in a layer of wax by worker bees.

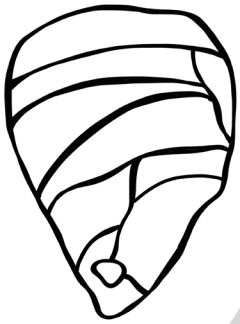
In the third stage, the larva spins a cocoon around itself. It is called a **pupa**. It starts to look more like a honeybee. It grows wings, legs, a head, a **thorax**, and an **abdomen**.



©Julia Bochoso

The last stage is the adult. The honeybee is fully-grown. It will chew through the wax covering on the egg cell. A queen bee will take about 16 days to grow into an adult. Worker bees need between 18 and 22 days. Drones need about 24 days.

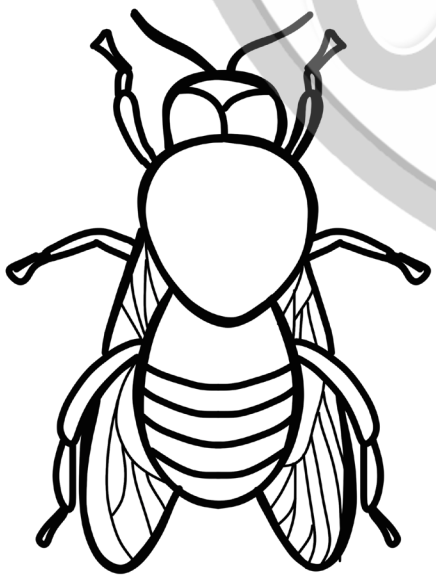




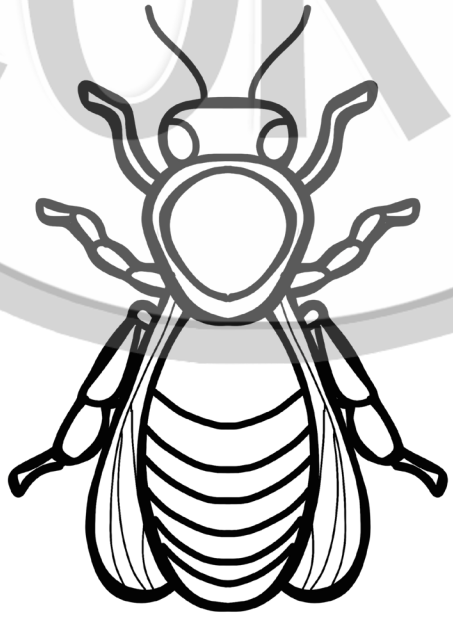
Nest

The lifespan of honeybees is different. Drones live an average of 55 days. If a drone mates with a queen, they die after. Worker bees raised during the spring and summer can live 6 or 7 weeks. Worker bees can live 4 to 6 months in the fall. A queen honeybee can live 2 to 4 years.

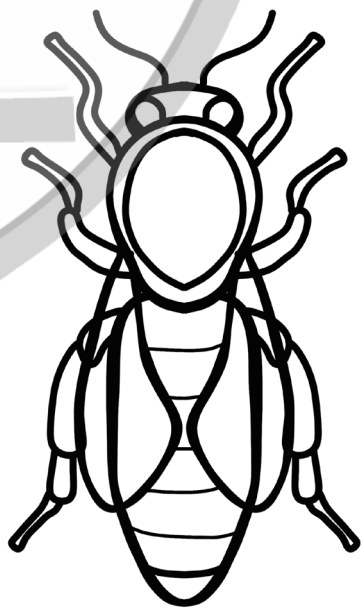
All bees go through these four main stages. Honeybees are **pollinators**. They help plants grow. Without them, many plants would die. Honeybees are important to our **ecosystem**. Learning the honeybees' life cycle can help us protect them.



Drone



Worker Bee

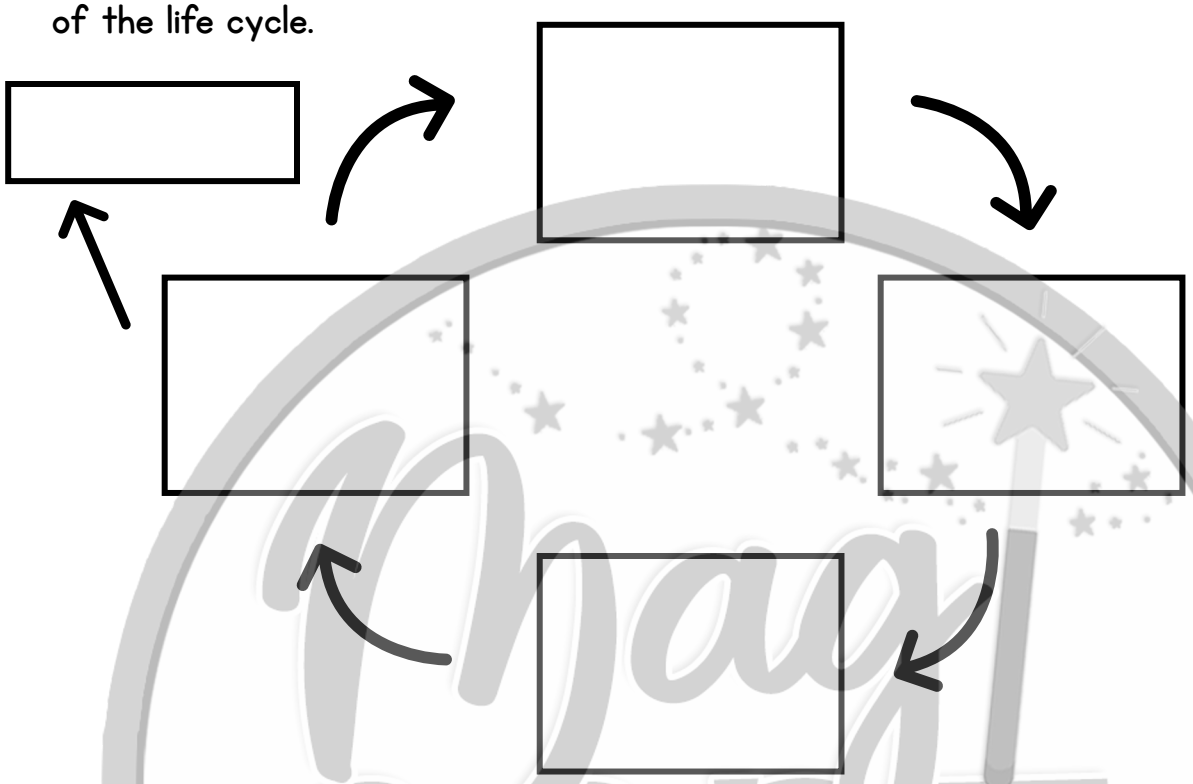


Queen Bee

©Julia Bachosa

Life Cycle of a Honeybee Questions

1. Complete the model to describe the life cycle of honeybees. Label all important stages of the life cycle.



2. Which of the following events might negatively impact the life cycle of a honeybee?
   a. People eat honey.
   b. People start a honeybee farm.
   c. A community sprays pesticides in their yards.
   d. A community grows a new field of flowers.

3. Explain how the event you chose might disrupt the life cycle of a honeybee. Use the model you drew above to explain the stages that would be impacted.

©Julia Bochoso

500L

Name: _____ Date: _____

The Life Cycle of a Sea Turtle



There are seven species of sea turtles. Six species are **endangered**. Humans are the biggest threats to sea turtles. Sea turtles are hunted for their eggs, meat, and shells. Their **habitats** are being destroyed. Climate change affects them. To save sea turtles, we should learn about their life cycles.



First, a female sea turtle is ready to nest. She comes ashore at night. Then, she digs a hole in beach sand. She uses her flippers to dig. She lays between 50–200 eggs in the nest. Eggs have soft shells. They are the size and shape of ping-pong balls. They are white or cream in color. The female covers the nest with sand. Then, she returns to the ocean. It takes 60–80 days for the babies to hatch from the eggs. Predators often eat sea turtle eggs. Humans have built houses and other structures along beach areas. This creates light, which makes it hard for sea turtles to return to the ocean.



Next, the eggs **hatch**. Baby sea turtles normally hatch at night. They break through their eggshells. Then, they dig in the sand to reach the surface. This can take a few days. The babies are in the open. They are **vulnerable** to birds and other predators. They run to the water for safety. Most hatchlings don't survive. They face many dangers.

©Julia Bochoso



Sea turtles that survive grow into **juveniles**. They eat seagrass and plankton. They stay in the ocean for a few years to a decade. Juveniles **mature** to sub-adults. They migrate toward the shore. Here, they feed on different food, such as algae. It's more dangerous by the shore. There are more predators.

Finally, sea turtles can mate and have babies. They are adults. They may travel thousands of kilometers. They mate near beaches. Females may lay 1-8 **clutches** of eggs. The males go back to areas with food. They restore their energy. The eggs are laid. The cycle begins again.



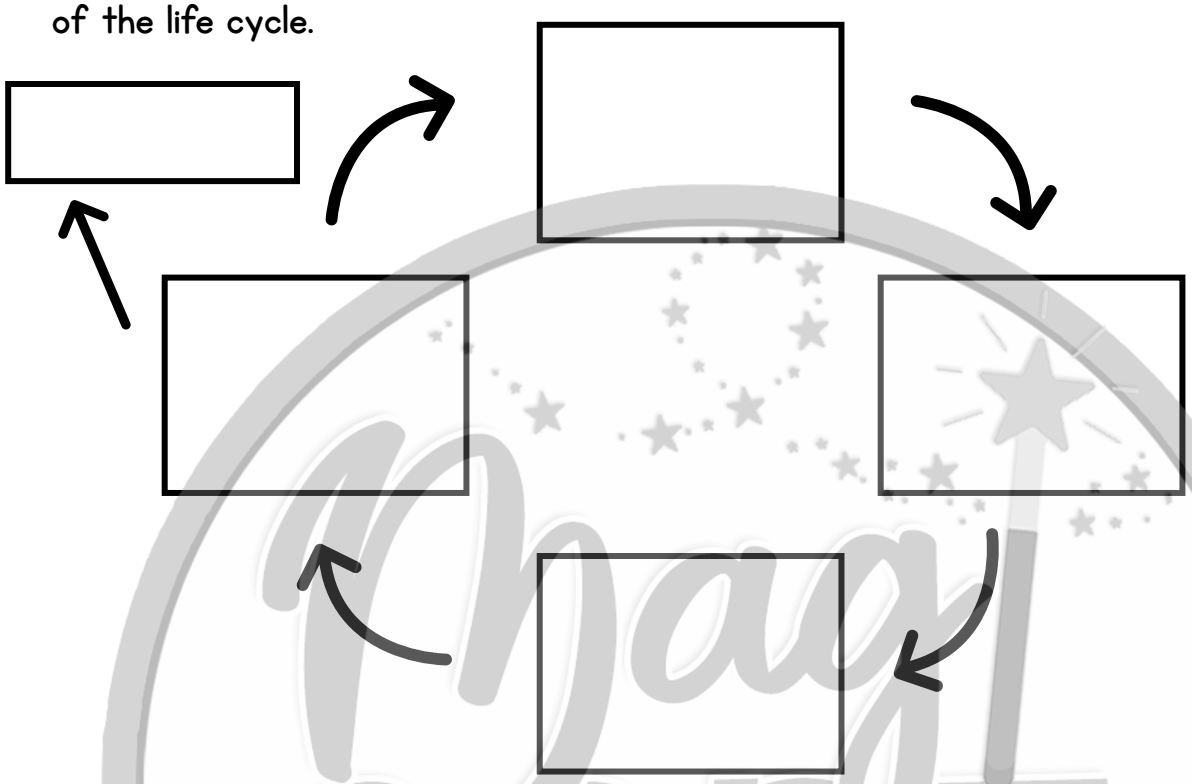


Humans can help sea turtles. We can help them cycle through these stages. We can help prevent marine pollution that harms sea turtles. We can also watch nesting beaches and help keep the conditions safe for the eggs and hatchlings. Finally, we can take steps to limit **climate change** and **global warming,** which is very important. The more we learn about sea turtles, the more we can protect them.

©Julia Bochoso

Life Cycle of a Sea Turtle Questions

1. Complete the model to describe the life cycle of sea turtles. Label all important stages of the life cycle.



2. Which stage of the sea turtle's life cycle is shown in the photograph?



3. The article describes many events that can disrupt the life cycle of a sea turtle. Choose one event. Use the model you drew above to explain the stages that would be impacted.

©Julia Bochoso

Inheritance and Variation of Traits

3rd grade

Table of Contents

1. How to Use This Resource
2. Inherited Traits in Plants (480L, 800L)
3. Inherited Traits in Animals (550L, 790L)
4. Hemmingway's Polydactyl Cats (470L, 810L)
5. Mendel's Pea Plants (560L, 820L)
6. Flower Fields (430L, 810L)
7. Inherited Traits in Cats and Kittens (460L, 790L)

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).

480L

Name: _____ Date: _____

Inherited Traits in Plants



Living things have **traits**. A trait is a characteristic. What something looks like is a trait. Ability is a trait. Traits can be inherited. An inherited trait comes from the parents. It is passed to the **offspring**. Height is inherited. Color is inherited. Shape and size are inherited. A cactus inherits spines. An evergreen tree inherits needles. Plants have inherited abilities. Roots grow down. Stems grow up. Leaves face the sunlight. Inherited abilities help the plants to survive.

The traits that get passed from parent plants to offspring plants depend on the **genes** of the parent plants. Genes carry information. These genes from parent plants combine in the offspring plant. Some traits will be shared between parent plants and offspring plants. Other traits will not. This is why parent plants and offspring plants have **similarities** and **differences**.

Traits may also be **acquired**. This means they are not inherited. Acquired traits happen to the plant. The plant learns to survive. A tree that has been slashed by a saw blade will have a scar on its bark. That scar didn't come from the parent trees. It will not be passed to the next generation of trees. Acquired traits are a response to something that happened in the plant's environment.

We can **analyze** inherited traits. Look at similarities and differences in plants. The plants can be **classified**. They can be sorted into groups based on features. Analyzing traits helps us see patterns. These patterns help us understand plants.

©Julia Bochoso

Inherited Traits in Plants Questions

1. List three traits of the cactus below.



1. _____

2. _____

3. _____

2. Give three examples of acquired and inherited plant traits.

Acquired Plant Traits	Inherited Plant Traits
1.	1.
2.	2.
3.	3.

3. Circle whether each trait is an acquired trait or an inherited trait.

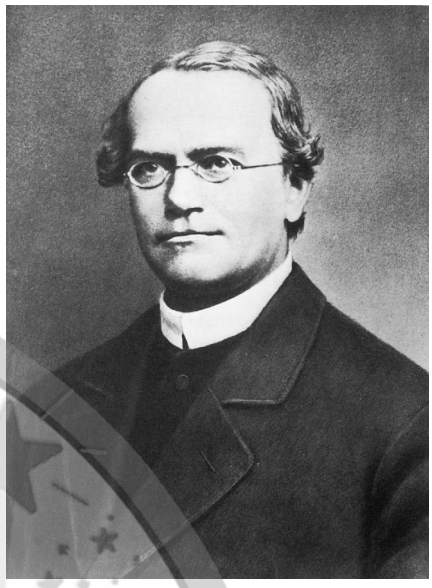
- A tall tree has a wound from being struck by lightning. acquired / inherited
- A flower is red with orange streaks. acquired / inherited
- A spider plant has holes due to an insect infestation. acquired / inherited
- A sunflower has a bent stem due to strong winds. acquired / inherited
- A flower has curved petals. acquired / inherited
- A green apple tastes sour. acquired / inherited

©Julia Bochoso

820L

Name: _____ Date: _____

Mendel's Pea Plants



Johann Gregor Mendel

Traits such as eye color, height, and hair color are passed from parents to children. This is called **heredity**. These traits are inherited through genes. **Genetics** is the study of heredity. Much of what we know about genetics is due to a curious monk from the 19th century. Johann Gregor Mendel is known as the "father of genetics." His work allowed scientists to understand how traits were passed from parents to offspring.

Mendel used pea plants to do his research. He chose these plants because they were easy to work with. They can **self-pollinate**. They can also be **cross-pollinated**. A plant is self-pollinated if pollen is transferred to it from any flower of the same plant. Cross-pollination, however, means pollen from one flower on one plant is moved to the **stigma** of another plant. Pea plants also have several traits that are simple to identify. Mendel studied seven traits. He looked at seed color, seed shape, flower position, flower color, pod shape, pod color, and stem length.

Before he began his experiments, Mendel grew pea plants with two forms of a feature. The features might be tall and short or white flower and purple flower. He grew these for several generations until he had **pure-bred** plants. Next, Mendel bred them to each other to create a second generation. Then, he took plants from this second generation with the same traits and bred them again, which produced a third generation. He carefully observed the results.



Pea Plant

©Julie Bachose



Purple-Flowering Pea Plant

These experiments revealed interesting **patterns**. Mendel found that one trait was always **dominant** in the first generation. For example, when he combined a white-flowering pea plant with a purple-flowering one, *all* the offspring had purple flowers. He concluded that the dominant trait was purple flowers. White flowers were hidden. This is called the **recessive** trait. The same thing happened with the height trait.

Another pattern was found when the pea plants with the dominant trait self-pollinated. In this generation, 75% of the offspring showed the dominant trait. Only twenty-five percent showed the recessive trait. This means that of four offspring pea plants, 3 of them would show purple flowers while 1 out of the 4 would be white.

Mendel was able to repeat these experiments. He got the same results every time. Other scientists of the time believed in different theories about inheritance. They thought traits were blended from parents in offspring. Mendel's experiments, however, showed that not to be true. If blending really occurred, purple pea plants bred with white pea plants would have produced pink pea plants. In 1868, Mendel decided to focus more on his duties as a monk than on science. His work wasn't picked up again until 1900 by other scientists studying heredity. They proved Mendel's findings to be correct.

©Julia Bacheso

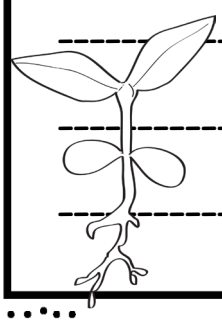
Mendel's Pea Plants Questions

1. What is Johann Gregor Mendel known for?

2. Why were pea plants a good subject to study for this experiment?

3. What two major patterns did Mendel discover?

4. Why are Johann Gregor Mendel's experiments important to the field of science and heredity?



©Julia Bochoso

Variation, Survival and Reproduction

3rd grade

Table of Contents

1. How to Use This Resource
2. Flower Power (520L, 820L)
3. Peacock Tails (440L, 830L)
4. Penguin Picking (480L, 770L)
5. Venus Flytrap Variations (480L, 620L)
6. Camouflaging the Peppered Moth (520L, 760L)
7. Beetle Size (490L, 760L)

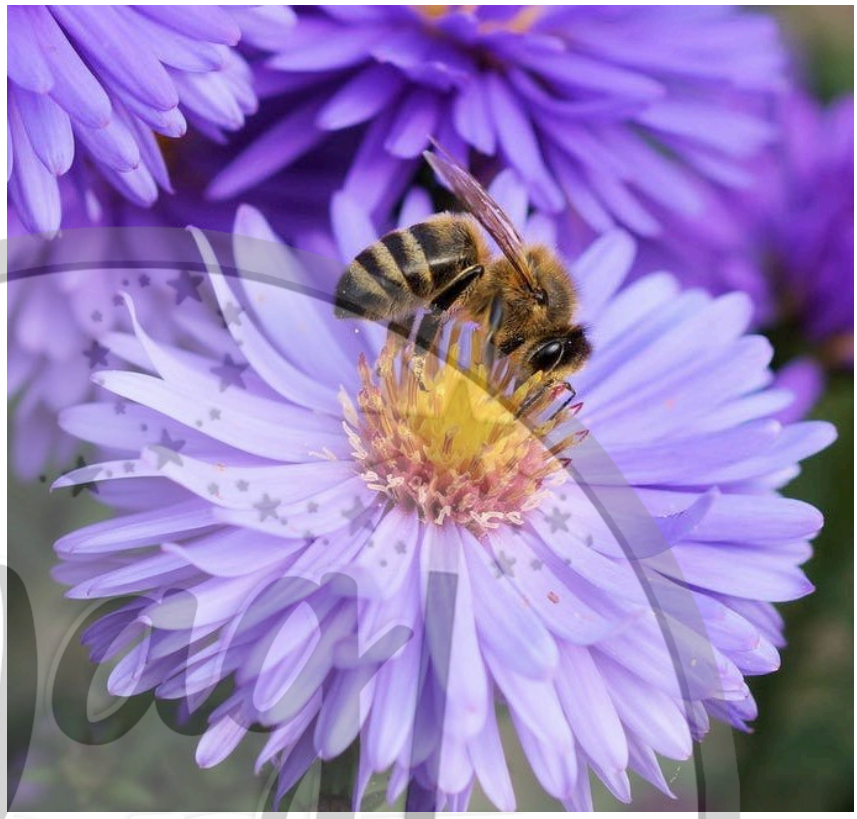
Each passage set includes two differentiated passages on a third-grade level (one at the beginning of the band, one towards the end) and a question set geared towards comprehension and science mastery. The first question is differentiated to include a fill-in-the-blank diagram (lower complexity) or an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

520L

Name: _____ Date: _____

Flower Power

Flowers are beautiful. They depend on pollination to survive. Some flowers are better at attracting **pollinators**. Flowers that attract more pollinators have an advantage. **Traits** that attract pollinators are petal color, stem height, and scent.



Bright colors are signs to pollinators. Bold reds and sunny yellows grab attention. Pollinators like deep purples. Some petals are brighter than others. This is called a **variation**. Those flowers are more likely to be visited by a pollinator. They will get pollinated. Then they will be able to reproduce. The flowers with duller petals might be passed over. Pollinators won't notice them. If that happens, they won't get pollinated. They won't make more flowers.



Flower field with a variety of flowers.

Plants of the same kind are about the same height. Sometimes a single plant grows taller. This plant gains an advantage. It will stand out to pollinators. It gets more sunlight. A group of taller plants creates a problem for shorter plants. The tall plants have big shadows. The shorter plants will get less sunlight. The taller plants could get even taller. Then the shorter ones could wilt and die.

©Julia Bochoso



Night blooming jasmine in full bloom.

Scent is another important trait of flowers. This is especially true in darkness. Colors are not seen as well in the dark. Night-blooming flowers still need to attract pollinators. They have to use another strategy. They use their scent. It attracts nighttime pollinators. Some flowers have a stronger, sweeter smell than others. Pollinators like these flowers. They will not visit the less fragrant flowers. This causes better-smelling flowers to survive more often.

Flowers use traits such as showy colors, height, and scent to get what they need. More flowers are able to grow and bloom thanks to these traits. Variations in traits give some flowers advantages. They give other flowers disadvantages.

©Julia Bochoso

Flower Power Questions

1. Fill out the chart below to show some variations in flowers and the advantages they provide.

Variation (cause)	Advantage (effect)
1. Bright color	1.
2.	2. Better access to sunlight
3. Strong scent	3.

2. Use the chart to show how variations in a single trait can affect flower growth.

Fragrance strength	Amount of pollinators
No scent →	
Weak scent →	
Strong scent →	

3. Take a look at the image of the flower field from the text. Choose one of the research questions below and explain how it could be used to discover which traits help flowers survive.
   - How does leaf size affect flower growth and reproduction?
   - How does color (white, purple, blue) affect flower growth and reproduction?

©Julia Bochoso

Environmental Change Solution

3rd grade

Table of Contents

1. How to Use This Resource
2. Safe Passage (490L, 800L)
3. In Search of Water (490L, 790L)
4. A Salmon Road Trip (490L, 740L)
5. Shady Chocolate (490L, 790L)
6. Welcome Back, Wolves (490L, 780L)
7. Oil Spill Clean-Ups (490L, 790L)

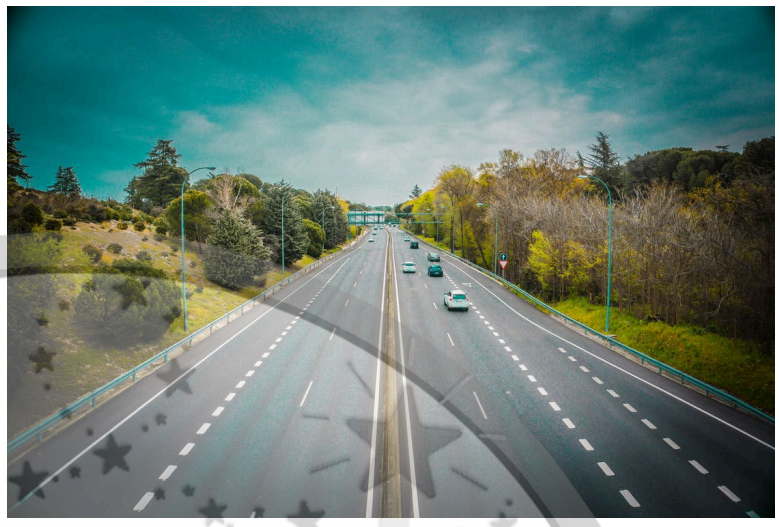
Each passage set includes two differentiated passages on a third-grade level (one at the beginning of the band, one towards the end) and a question set geared towards comprehension and science mastery. The first question is differentiated to include a fill-in-the-blank diagram (lower complexity) or an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

490L

Name: _____ Date: _____

Safe Passage

The Cascades are mountains. They run from California through Oregon and Washington. They end in British Columbia, Canada. This mountain range has forests, slopes, and lakes. Many different **organisms** live in these mountains. Gray wolves and deer are a few **mammals** in the Cascades. Fish and reptiles are part of this **ecosystem**. Birds and insects also live there.



Highway animals cannot cross.

People live in the Cascades, too. They travel through the area. One major highway is Interstate 90, or I-90. This highway cuts across the Cascades. It carries over 28,000 cars a day. I-90 causes a problem. Its location affects wildlife movement in the Cascades. It stops safe **migration**. Accidents happen when animals cross the highway. Animals and people die in these crashes.



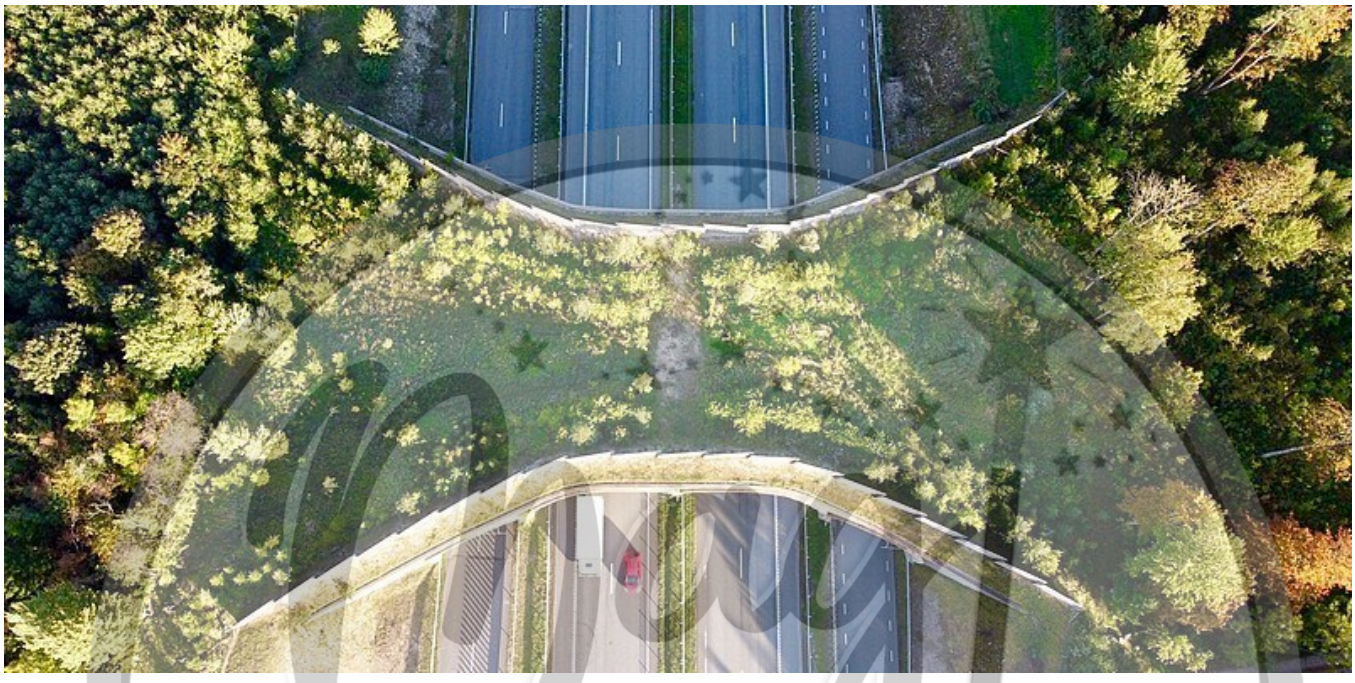
Example of a wildlife bridge in Canada.

I-90 has other effects, too. It blocks animal movement. This makes finding food hard. I-90 also makes finding new mates tricky. The animals won't be reproducing as much. Their numbers could decrease. I-90 is a danger to animal **survival**.

Builders have made wildlife bridges to solve the problem. Some of

©Julia Bochoso

these bridges are built over highways. This keeps animals out of traffic. One wildlife overcrossing is near Snoqualmie Pass in Washington. This bridge looks natural to animals. It has dirt and plants. High walls protect animals. Fences along the highway guide animals to the overpass.



Aerial view of a wildlife bridge.

Below the bridge are two arches for cars to drive under. The bridge costs over $6 million. It's doing its job. Many species have been seen crossing I-90 without harm. It didn't take them long to figure out how the bridge worked either. Coyotes and elk are some of the animals using the bridge. Many animals in the Cascades are able to live in this **environment** without danger from the highway.

Wildlife bridges are one **solution.** The only problem has been humans entering these bridges that are for wildlife. Humans on the bridges may stop animals from using them. Signs have been posted. They ask people to stay out. The bridges are also being watched.

©Julia Bochoso

Safe Passage Questions

1. Use the chart below to describe the problem and solution described in the article.

Problem	Solution
Interstate 90 carries 28,000 cars daily through the Cascade Mountains. This puts animals and humans at risk from accidents.	

2. Describe the problem the interstate has caused in the Cascades mountains in more detail.

---

3. Is the solution in the article effective at solving the problem? Give reasons from the text to support your answer.

©Julia Bochoso

Seasonal Weather Conditions

3rd grade

Table of Contents

1. How to Use This Resource
2. The New York City Marathon (500L, 820L)
3. Uttarayan International Kite Festival (480L, 760L)
4. Albuquerque International Balloon Fiesta (490L, 810L)
5. Tour de France (470L, 730L)
6. National Cherry Blossom Festival in Washington, D.C. (490L, 810L)
7. Dublin St. Patrick's Day Parade (490L, 740L)

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 seven differentiated passages aligned to the following standard:

3-ESS2-1: Seasonal Weather Conditions

Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. (Patterns)

Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.

Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.

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.

500L

Name: _____ Date: _____

The New York City Marathon

Many people enjoy running. Runners may enter a **marathon**. A marathon is a running race. It covers a distance of 26 miles and 385 yards. This race is not run on a track. It's run on city streets instead. The New York City Marathon is run in the United States. This race is held every November.



New York City

The first New York City Marathon was held in 1970. It only cost $1 to enter. The route took runners through Manhattan's Central Park. This marathon had grown too big for the park by 1976. It was moved to begin at Staten Island and end in Manhattan. The New York City Marathon has been run almost every year. It has only been cancelled twice. Hurricane Sandy shut it down in 2012. COVID-19 stopped it in 2020.



Runners in the New York City Marathon

Many big moments have happened in this marathon. People have set records for running in it. The marathon made it onto television in 1981. The first wheelchair division was added in 2000. The number of finishers was more than 50,000 in 2013.

©Julia Bochoso

Weather plays a part in a marathon. Sunny and dry weather is best. T**emperatures** between 50°F and 60°F are perfect. The New York City Marathon was first run in September. It was then moved to October. Early November finally became the right time. That month had less high **humidity**. This keeps athletes from running in unsafe temperatures.

Average Monthly Weather

New York City, New York, United States

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Average High Temp in °F	39°F	43°F	52°F	64°F	72°F	80°F	84°F	84°F	76°F	64°F	55°F	44°F
Average Rainfall in inches	3.8	3.3	4.4	4.3	4.4	4.3	4.6	4.5	4.4	4.2	4.1	4.2
Average Snowfall in inches	8.4	9.2	4.1	0.5	0	0	0	0	0	0.1	0.5	3.9

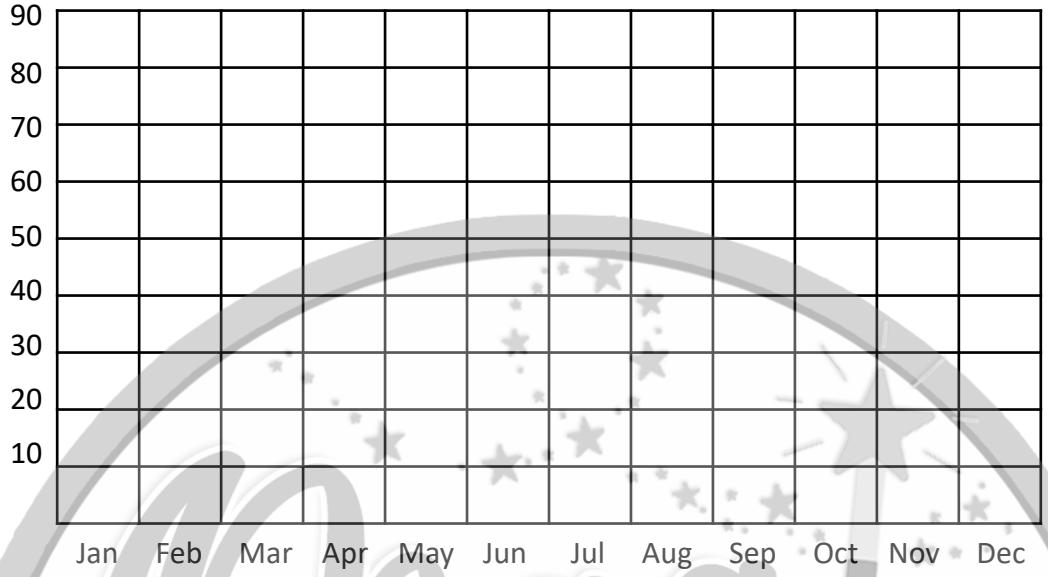
(Source: NOAA)

The New York City Marathon has been run in **precipitation**. There have even been race days with gusty winds. The runners won't be stopped by the weather, though. They've got their eyes on the finish line.

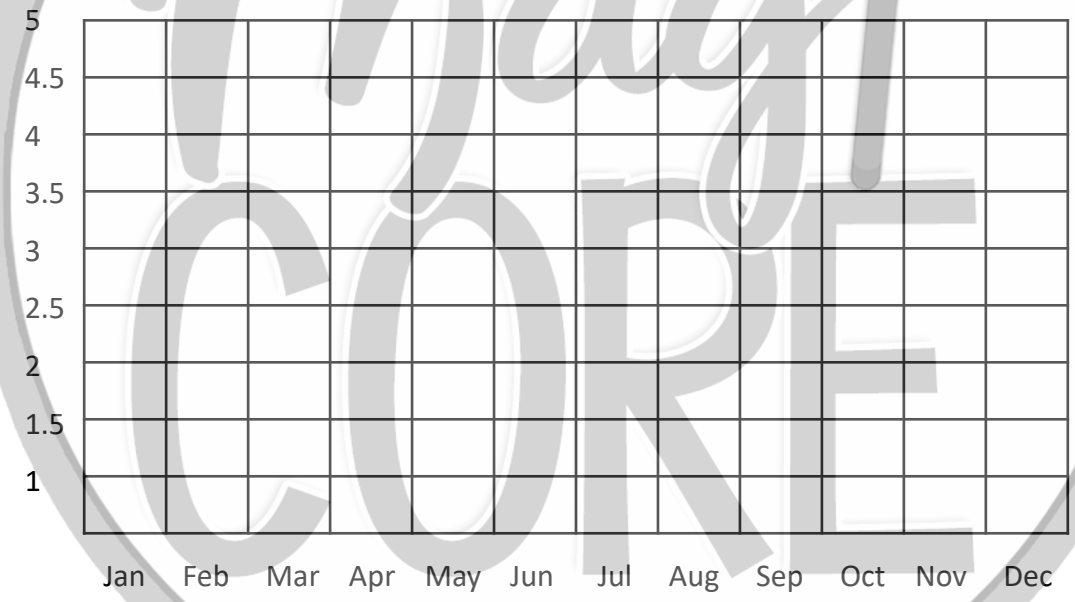
©Julia Bachosa

New York City Marathon Questions

1. Use the grid below to create a graph representing average high temperature in New York City.



2. Use the grid below to create a graph representing average rainfall (in inches) in New York City.



3. Based on your graphs, is November the best choice for the New York City Marathon? Why or why not? Use evidence from your graphs.

---

4. If the New York City Marathon had to be moved, which month would you suggest it be moved to? Use evidence from your graphs.

©Julie Bochorsa

760L

Name: _____ Date: _____

Uttarayan International Kite Festival



Uttarayan means "when the sun starts its northward journey." It marks the end of the winter **season** for India. The sun returns to warm the northern **hemisphere**. Uttarayan is celebrated on January 14th with a *patang*, or kite-flying, festival in India. Gujarat, a state in northwestern India, is known for its Uttarayan International Kite Festival. This festival began in 1989.

Children and adults get involved in the kite festival. After winter, people believe the bright sunshine of Uttarayan brings good health. The festival is a great way to enjoy the weather outside. Special foods such as *laddu* are served. Laddu is a ball-shaped sweet made from flour, sugar, and shortening. Families buy or make their own kites. Kite flying starts early in the morning and goes into the night. This festival is a time for socializing. People gather on the flat roofs of houses and buildings. They have friendly kite competitions. The skies are full of kites in every color, every size, and every shape. The festival brings master kite flyers from all over the world. At night, bright white kites and thousands of paper lanterns fill the dark sky.

Each Uttarayan season, more than 10 million kites are sold in Ahmedabad, Gujarat's largest city. Kites like big, open spaces and wind for flying. When the wind has to go around objects in its path, such as buildings and trees, it gets bumpy, or **turbulent**. This kind of wind isn't good for flying kites. The amount of wind you need depends on the kite you have. Heavy

©Ruth Backus

kites need more wind. Other kites are designed for light wind. Most kites need average **wind speeds** between 4 and 10 miles per hour. Kites can often be adjusted for different wind conditions. An experienced kite flyer always watches the wind.

Average Monthly Weather

Gujarat, India

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Average Wind Speed in miles per hour	2.4	2.1	2.2	2.8	4.5	4.7	4.4	3.9	2.7	1.7	1.7	2.0
Average Temp in ˚F	69˚F	73˚F	81˚F	88˚F	91˚F	89˚F	83˚F	81˚F	82˚F	82˚F	77˚F	71˚F
Average Precipitation in inches	0	0	0	0	0	2.9	12.1	9.5	4.3	0.7	0.1	0
Average Hours of Sun	9.7	10.2	10.8	11.4	11.3	9.5	7.1	6.2	8.0	10.1	9.9	9.6

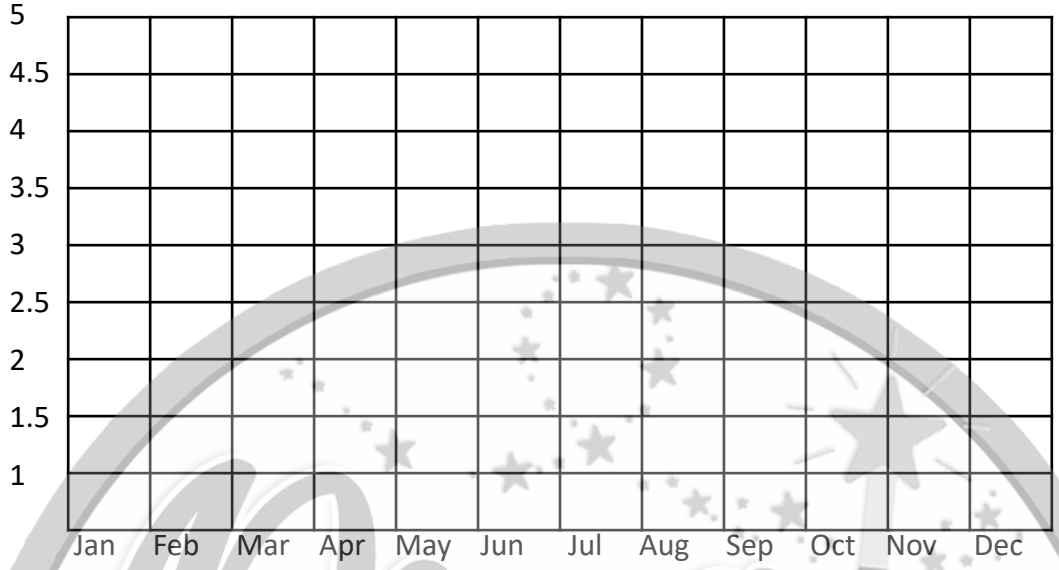
(Source: climate-data.org)

The Uttarayan International Kite Festival is a happy time for Indians. It brings people together to have fun outdoors as the season changes.

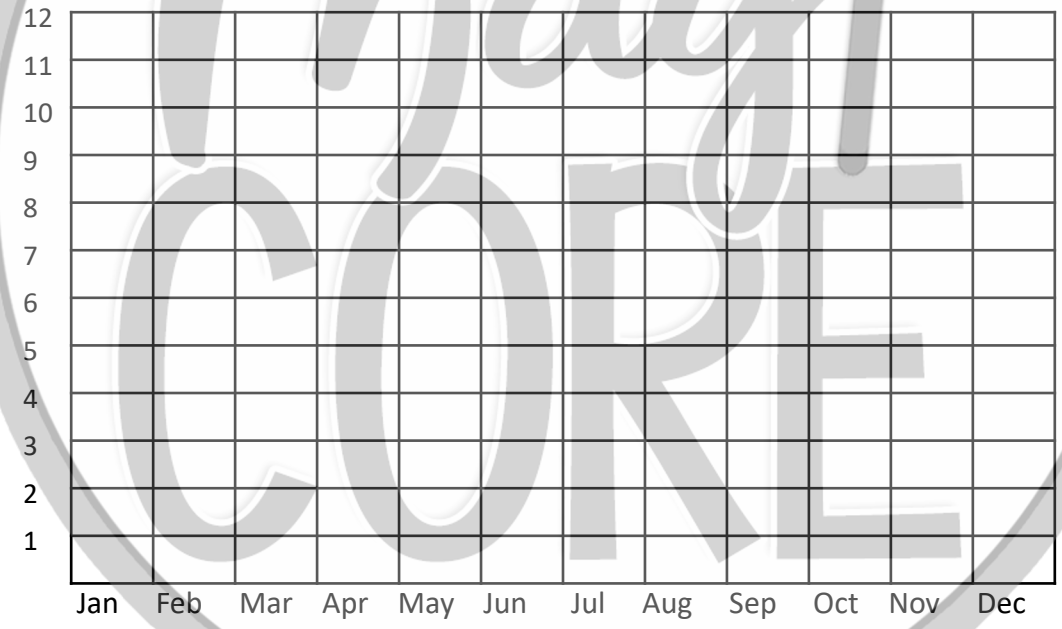
©Julia Bachosa

Uttarayan International Kite Festival Questions

1. Use the grid below to create a graph representing wind speed in Gujarat, India.



2. Use the grid below to create a graph representing average rainfall (in inches) in Gujarat, India.



3. Based on your graphs, why do you think they picked January 14th for the kite festival? Use evidence from your graphs.

---

4. If the Uttarayan Kite Festival had to be moved, would August be a good choice for the festival? Use evidence from your graphs.

©Julia Bochoso

470L

Name: _____ Date: _____

Tour de France



The Tour de France is over 100 years old. The first Tour de France took place in 1903. It is the world's longest cycle race. Athletes travel over 2,200 miles. The race is 23 days long. It happens in July. The route is a little different each year. The race doesn't just take place in France, either. It has also traveled through nearby countries. It always ends in Paris, France.

Each day of the Tour de France is called a "stage." The stages can last up to 6 hours. There is a total of 21 stages. Riders get two days to rest. The race goes over flat land. It also goes through mountains. Some parts of the race are downhill. Riders move fast on those parts. Others are hard climbs for miles. The winner of the Tour de France has the fastest time for all the stages together.

Weather affects the Tour de France. Some of the start locations are not close. The weather could change along the route. Rain is the biggest threat. This **precipitation** can make roads slick. That is dangerous for cyclists. Hot, **humid** weather makes pedaling up a mountain a struggle. **Crosswinds** can separate teammates.

Average Monthly Weather

Paris, France

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Average Wind Speed in miles per hour	11.5	11.2	10.7	9.9	9.1	8.7	8.4	8.1	8.9	9.8	10.3	11.1
Average High Temp in °F	46°F	48°F	55°F	62°F	68°F	74°F	78°F	78°F	71°F	63°F	52°F	47°F
Average Rainfall in inches	2.2	2	2.1	2.2	2.7	2.5	2.4	2.4	2	2.6	2.5	2.8
Average Humidity %	85%	81%	76%	71%	71%	68%	65%	66%	71%	79%	86%	86%

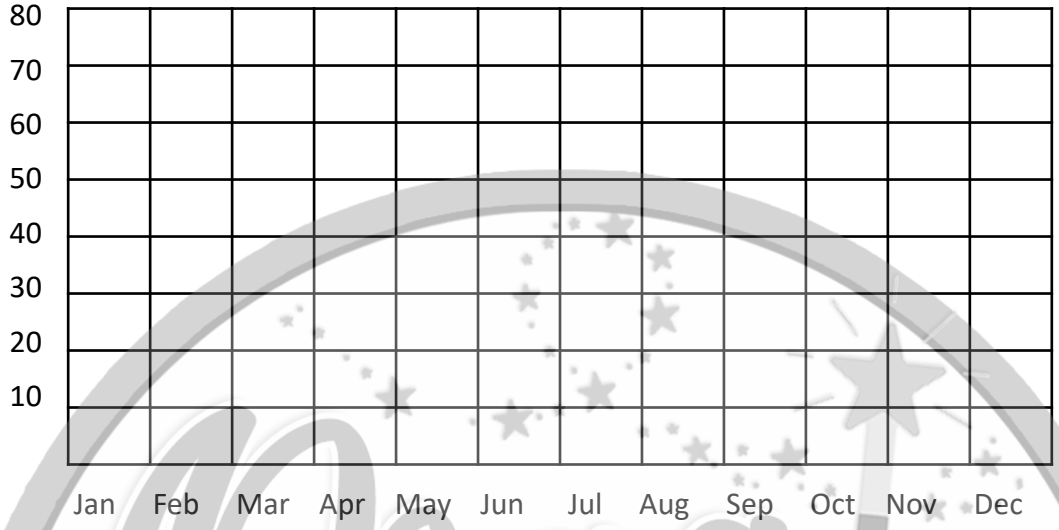
(Source: NOAA and climate-data.org)

Riding in the Tour de France takes strength. It is one of the most difficult athletic events in the world. Cyclists push their bodies to win.

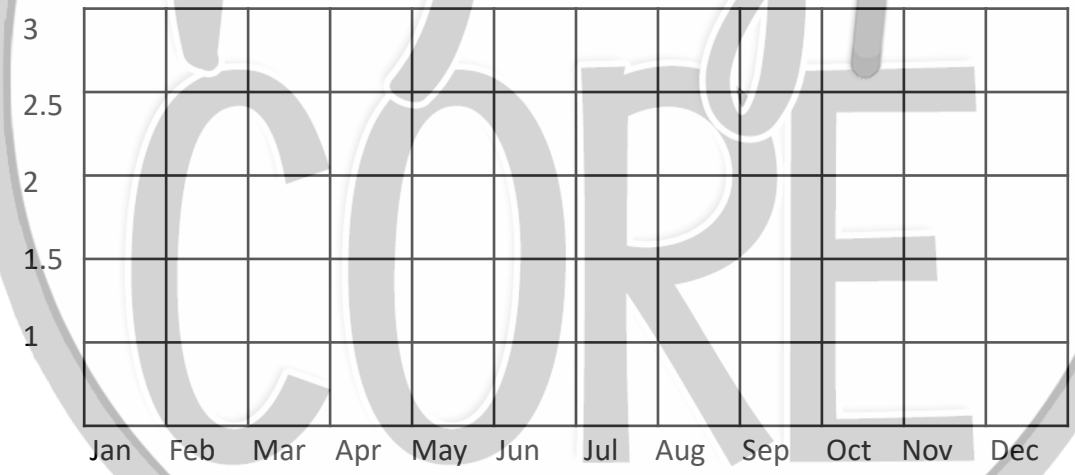
©Julio Bochoso

Tour de France Questions

1. Use the grid below to create a graph representing average high temperature in Paris, France.



2. Use the grid below to create a graph representing average rainfall (in inches) in Paris, France.



3. Based on your graphs, why do you think they picked July for the Tour de France? Use evidence from your graphs.

---

4. If the Tour de France had to be moved, would September be a good month to move it to? Use evidence from your graphs.

©Julia Bachosa

World Climates

3rd grade

Table of Contents

1. How to Use This Resource
2. World Climate Graphic Organizer
3. Equatorial Climate (480L, 780L)
4. Polar Climate (480L, 720L)
5. Marine West Coast Climate (490L, 790L)
6. Mid-continental Climate (470L, 800L)
7. Highland Climate (490L, 800L)
8. Temperate Climate (490L, 790L)
9. Essay Template

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 seven differentiated passages aligned to the following standard:

3-ESS2-2: World Climates

Obtain and combine information to describe climates in different regions of the world. (Patterns)

Clarification Statement: None

Assessment Boundary: None

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.

Climate Patterns

Use this chart to take notes on each climate type. You will use these notes to write an essay at the end of this resource.

Climate	Average Temperature	Average Precipitation	Description of Climate
Equatorial Climate			
Polar Climate			
Marine West Coast Climate			
Mid-Continental Climate			
Highland Climate			
Temperate Climate			

©Jodie Bocklage

480L

Name: _____ Date: _____

Equatorial Climate

The **equator** is a line around the earth. It is imaginary. It is the same distance from the North and South Poles. This line cuts the earth into two parts. Costa Rica in Central America is near the equator. Kenya in Africa is also there. The **weather** is **tropical**. These areas have strong sunlight all year. They do not have all four **seasons**. Some places have one hot season. Others have two seasons, a dry one and a wet one.



Beach in Limon, Costa Rica

Rainforests are found in **regions** close to the equator. They have many plants and animals. More kinds of plants are in a rainforest than in other places. Rainforests have half of the world's animal species. They also give about 40% of the world's oxygen. The plants and animals that live in the rainforest are able to live in an **equatorial climate**.



Palm tree during monsoon

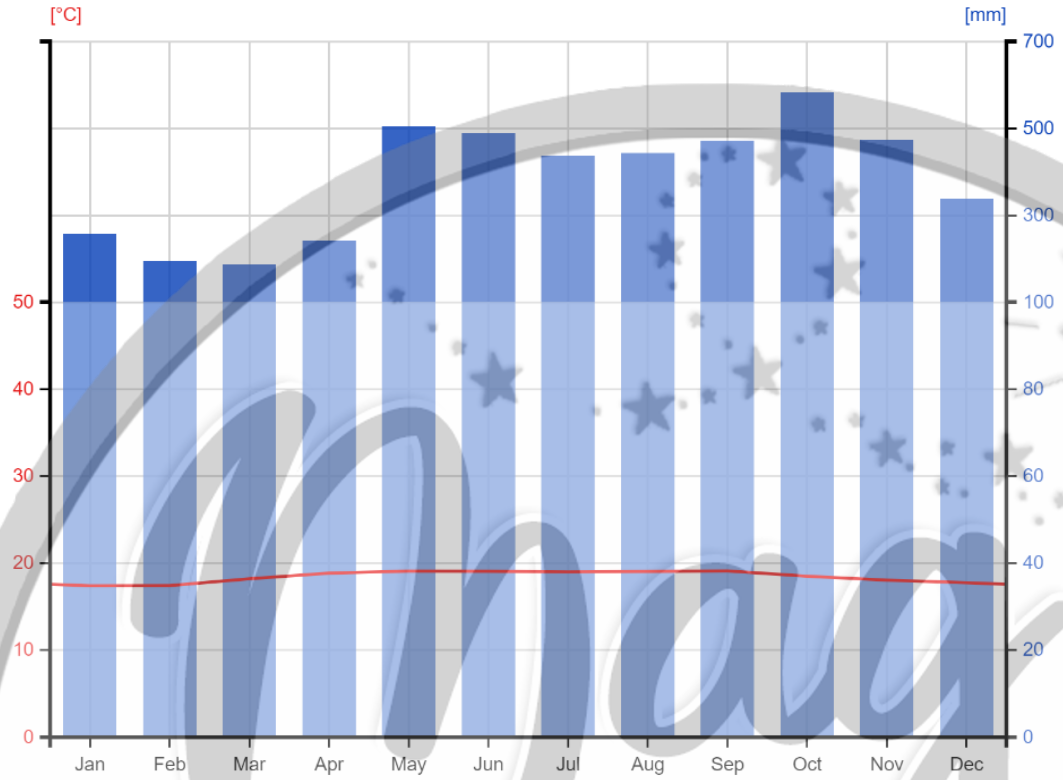
Monsoons happen in some places near the equator. Wind **patterns** cause this weather. The winds carry moisture. This moisture is from the ocean. It is released in heavy rains. Monsoons can be good for growing crops. Flooding can cause problems, though.

People living in this area must be ready for the climate. The clothes they wear are appropriate for the weather. The foods they grow are also right for the climate. The activities they do depend on the climate, too.

©Julia Bochoso

Average Monthly Temperature and Precipitation for Paraíso, Cartago, Costa Rica

9.749N, 83.753W | Elevation: 1400 m | Climate Class: Cfb | Years: 1990-2019

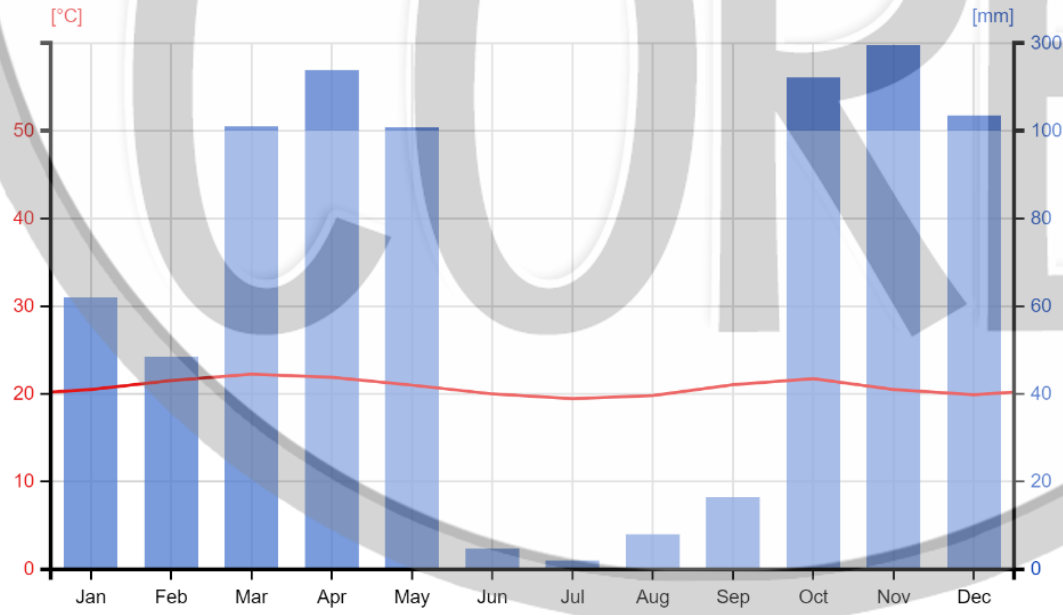


Month	Temp	Precip
Jan	17.4	257.8
Feb	17.4	194.3
Mar	18.2	186.5
Apr	18.8	241.4
May	19.1	504.8
Jun	19.1	488.5
Jul	19.0	436.8
Aug	19.0	443.9
Sep	19.1	472.4
Oct	18.5	583.6
Nov	18.0	473.2
Dec	17.7	337.7

Temperature Mean: 18.4 °C Precipitation Sum: 4621.1 mm

Average Monthly Temperature and Precipitation for Ruiri, Meru, Kenya

0.024N, 37.906E | Elevation: 863 m | Climate Class: A | Years: 1990-2019



Month	Temp	Precip
Jan	20.5	61.9
Feb	21.5	48.4
Mar	22.2	109.0
Apr	21.9	237.9
May	21.0	107.9
Jun	20.0	4.6
Jul	19.4	1.9
Aug	19.8	7.9
Sep	21.0	16.5
Oct	21.7	220.9
Nov	20.5	295.7
Dec	19.9	135.1

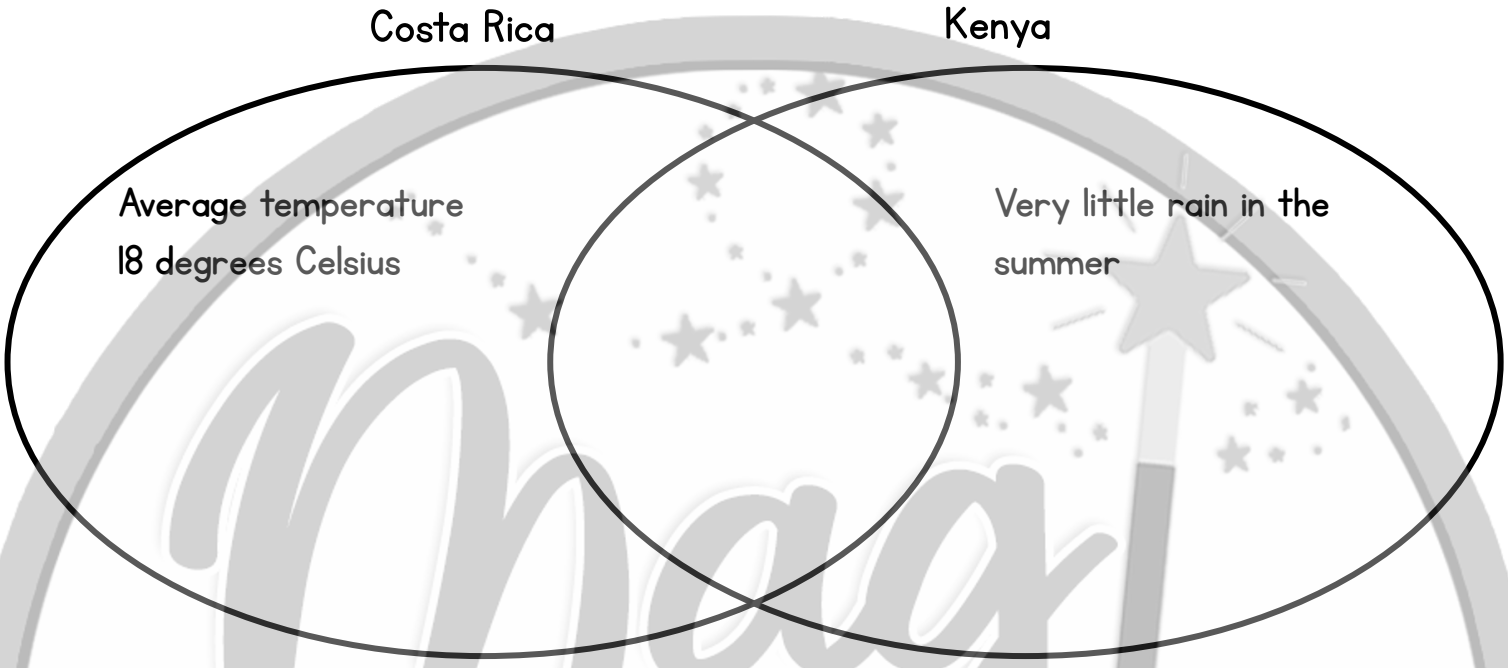
Temperature Mean: 20.8 °C Precipitation Sum: 1247.7 mm

(Note: Red line is temperature. Blue bar is precipitation.)

©Julia Bochoso

Equatorial Climate Questions

1. Use the Venn Diagram to compare the climates in the 2 regions presented in the graph.



2. Describe the location of equatorial climates.

---

3. Based on the information in the text, how would you prepare to visit this type of climate? What would you need to bring with you?

©Julia Bochoso

470L

Name: _____ Date: _____

Mid-Continental Climate

Mid-continental climates are found **inland**. They are not near oceans. Quebec City in Canada is part of this zone. All four **seasons** happen here.



Quebec City in winter

The animals that live in this climate zone **adapt** to the weather. Antelope are found here. They grow long fur in the winter. They shed these coats in the summer. Small mammals include squirrels and raccoons. They eat nuts and insects. Reptiles and frogs live here, too. Many birds **migrate** to another climate in winter.



Oak trees with leaves in summer

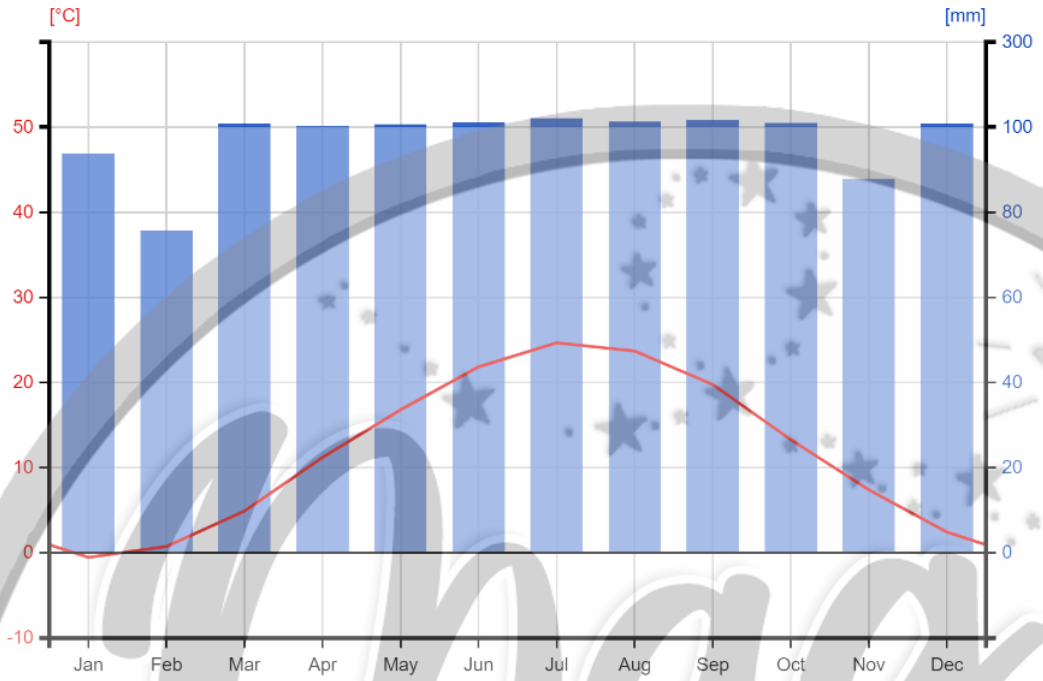
Plants in the mid-continental climate zone can handle the seasons. Oak trees are in this **region**. They can live through different temperatures. Most shrubs and grasses do well here, as well.

People live in mid-continental climates. T-shirts are worn in the summer. Jackets are needed in the winter. Houses have heat in the colder months. They often have air conditioning for the warmer months. Tornadoes and blizzards can happen in this climate area. People usually enjoy the different seasons, though.

©Julio Bochoso

Average Monthly Temperature and Precipitation for New York City, New York, United States

40.7N, 74.006W | Climate Class: Cfa | Years: 1990-2019

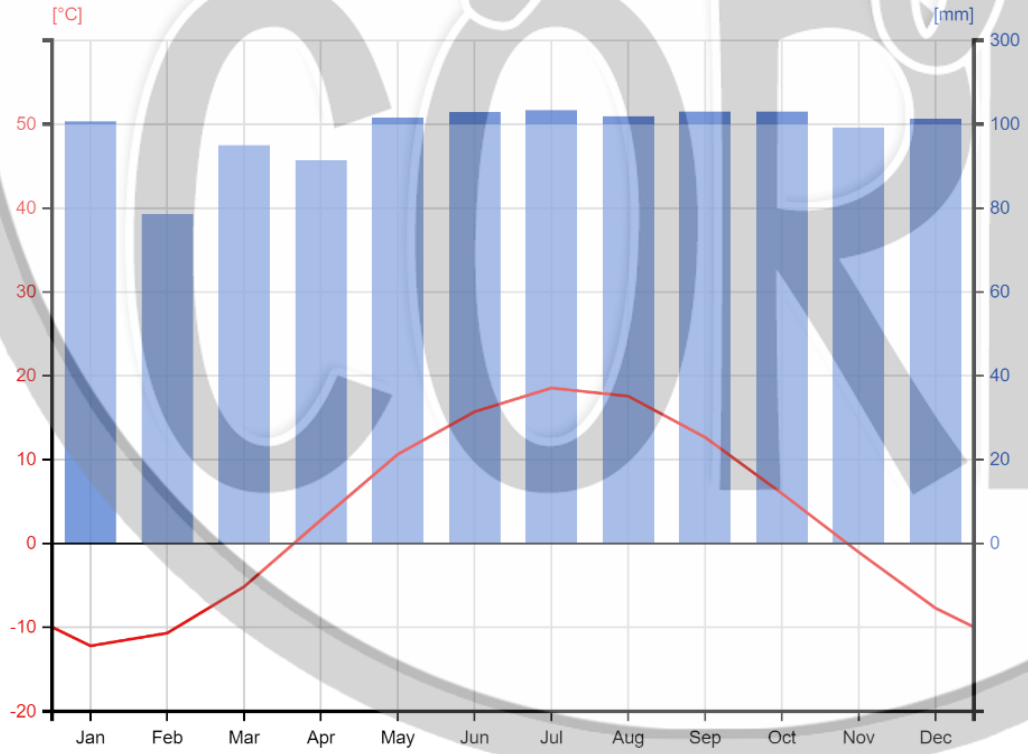


Month	Temp	Precip
Jan	-0.5	93.7
Feb	0.7	75.7
Mar	4.9	108.7
Apr	11.2	101.7
May	16.8	106.7
Jun	21.8	111.9
Jul	24.6	120.9
Aug	23.7	113.2
Sep	19.8	115.4
Oct	13.3	109.6
Nov	7.4	87.7
Dec	2.4	107.3

Temperature Mean: 12.2 °C Precipitation Sum: 1252.6 mm

Average Monthly Temperature and Precipitation for Québec, Quebec, Canada

46.814N, 71.208W | Elevation: 52 m | Climate Class: Dfb | Years: 1990-2019



Month	Temp	Precip
Jan	-12.2	105.8
Feb	-10.7	78.7
Mar	-5.2	95.0
Apr	2.8	91.3
May	10.6	115.3
Jun	15.7	128.5
Jul	18.5	133.6
Aug	17.6	118.3
Sep	12.7	130.4
Oct	6.0	130.0
Nov	-1.0	99.3
Dec	-7.7	112.8

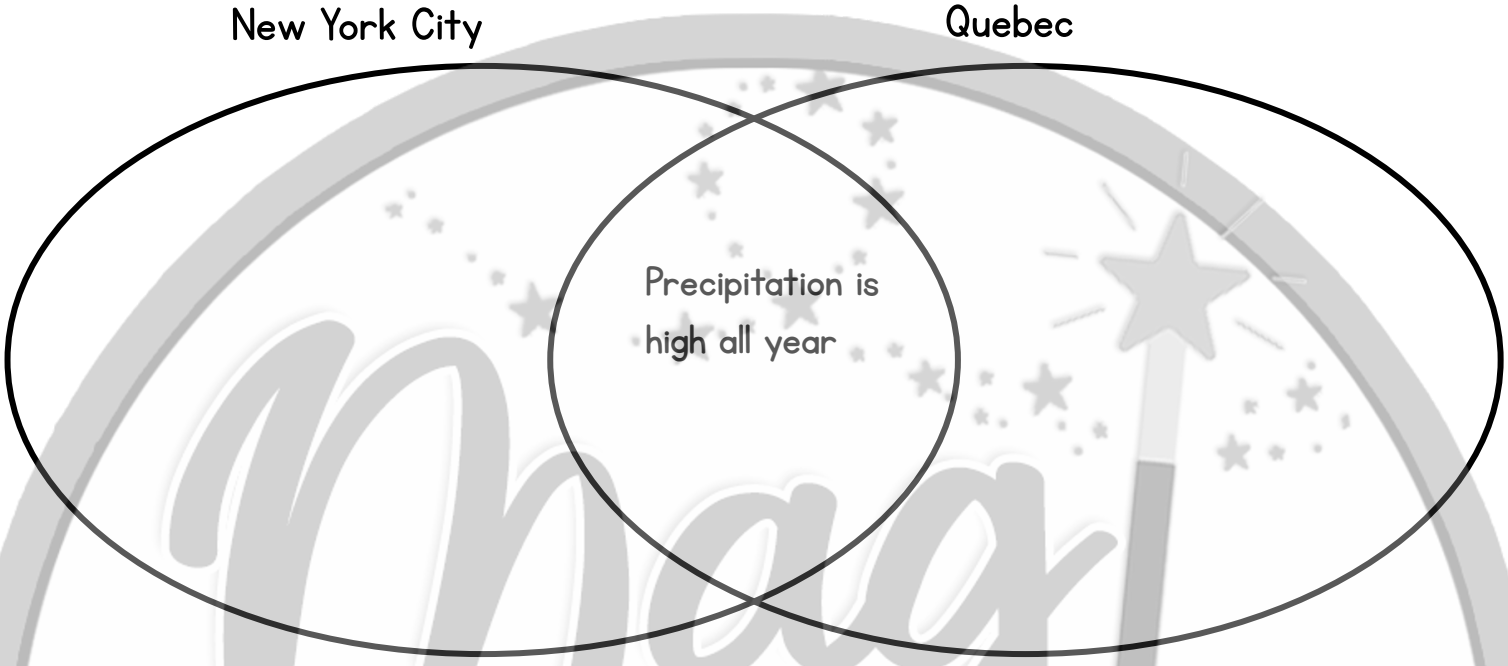
Temperature Mean: 3.9 °C Precipitation Sum: 1339 mm

(Note: Red line is temperature. Blue bar is precipitation.)

©Julia Bochoso

Mid-Continental Climate Questions

1. Use the Venn Diagram to compare the climates in the 2 regions presented in the graph.



2. Describe the location of mid-continental climates.

---

3. Based on the information in the text, how would you prepare to visit this type of climate? What would you need to bring with you?

©Julia Bochoso

490L

Name: _____ Date: _____

Temperate Climate



The temperate climate zone is between the equatorial and polar regions. Different kinds of weather happen here. All four seasons are found in this zone. Most continents have land in the temperate climate zone. Antarctica does not.

Temperate forest in the fall

Temperate climates have many animals. Owls and rabbits live here. Birds like seagulls make this their home, too. Moose and bears can be found in forests. Turtles and many insects live in this zone, as well. Its climate is good for plant growth, too. Trees fill the forests. Wildflowers are also common.

Most of the world's people live in this climate zone. Cities have been built here. City life affects climate. Cities are warmer than the areas around them.

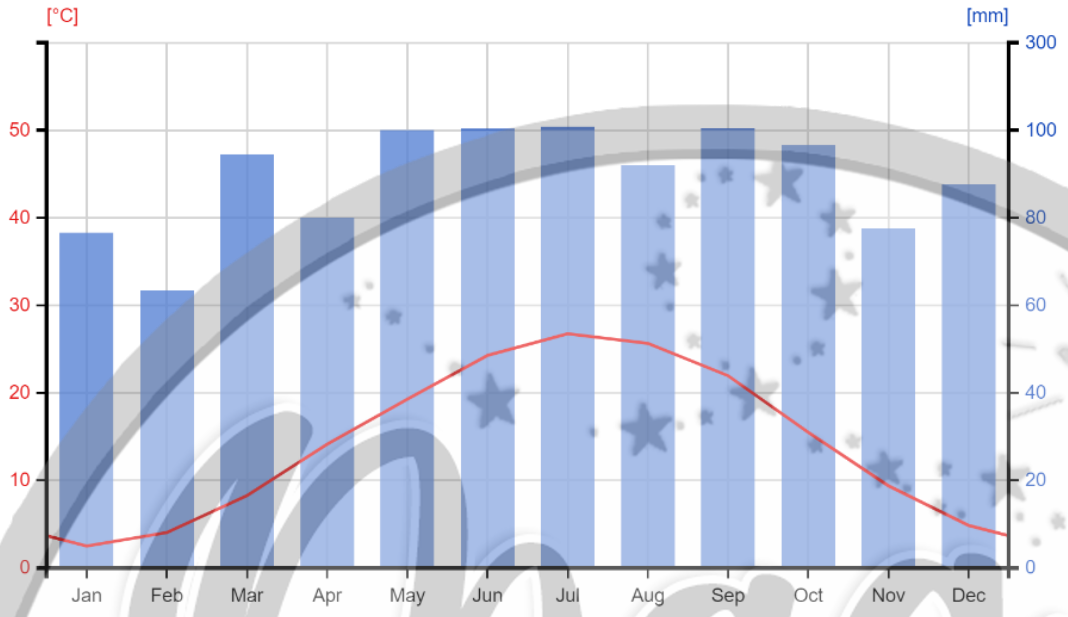


Washington, D.C.

©Julie Bachose

Average Monthly Temperature and Precipitation for Washington, Washington, D.C., United States

38.907N, 77.037W | Elevation: 29 m | Climate Class: Cfa | Years: 1990-2019

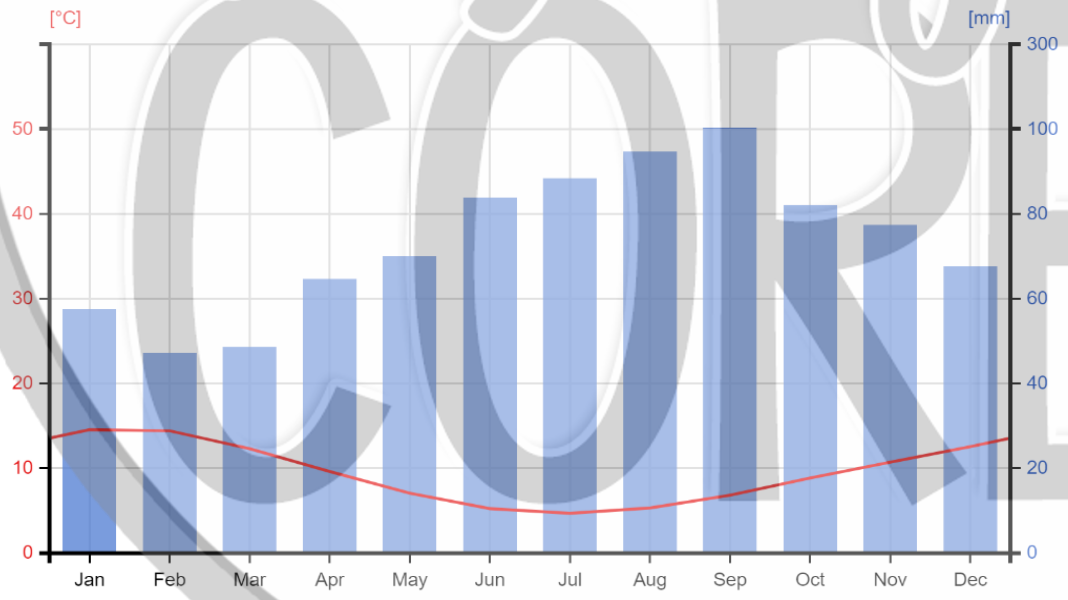


Month	Temp	Precip
Jan	2.5	76.5
Feb	4.0	63.4
Mar	8.2	94.5
Apr	14.1	80.1
May	19.3	100.9
Jun	24.3	103.8
Jul	26.7	107.4
Aug	25.6	92.0
Sep	21.9	105.3
Oct	15.5	96.6
Nov	9.4	77.6
Dec	4.8	87.7

Temperature Mean: 14.7 °C Precipitation Sum: 1085.6 mm

Average Monthly Temperature and Precipitation for Miena, Tasmania, Australia

42.041S, 146.809E | Elevation: 905 m | Climate Class: Cfb | Years: 1990-2019



Month	Temp	Precip
Jan	14.5	57.6
Feb	14.4	47.2
Mar	12.3	48.5
Apr	9.6	64.6
May	7.0	70.0
Jun	5.2	83.7
Jul	4.7	88.3
Aug	5.3	94.7
Sep	6.8	103.2
Oct	8.8	82.1
Nov	10.7	77.4
Dec	12.5	67.6

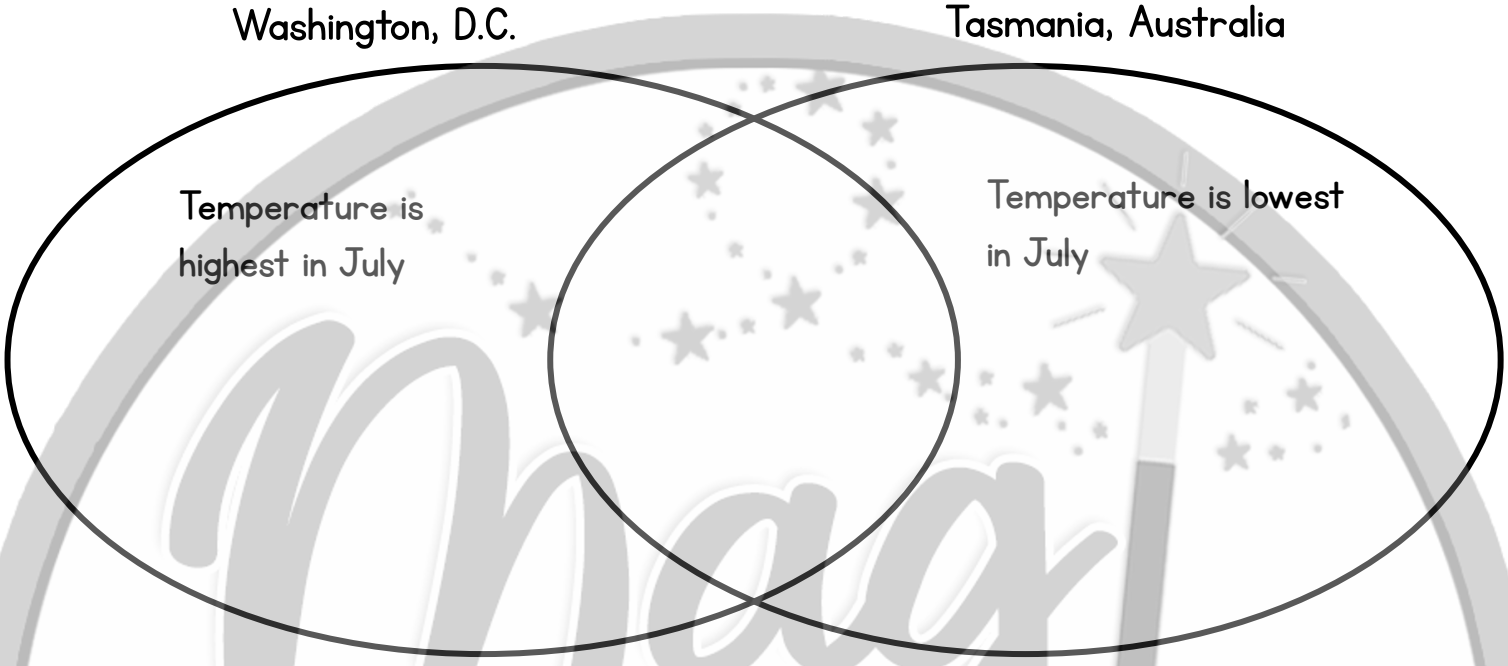
Temperature Mean: 9.3 °C Precipitation Sum: 884.9 mm

(Note: Red line is temperature. Blue bar is precipitation.)

©Julia Bochoso

Temperate Climate Questions

1. Use the Venn Diagram to compare the climates in the 2 regions presented in the graph.



2. Describe the location of temperate climates.

---

3. Based on the information in the text, how would you prepare to visit this type of climate? What would you need to bring with you?

©Julia Bochoso

Weather-Related Hazard Solution

3rd grade

Table of Contents

1. How to Use This Resource
2. Amphibious Homes (480L, 780L)
3. Lightning Rods (500L, 790L)
4. Levees (500L, 820L)
5. Stilt Houses (490L, 730L)
6. Tuned Mass Dampers (490L, 750L)
7. Tornado Proof Homes (490L, 760L)

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 seven differentiated passages aligned to the following standard:

3-ESS3-1: Weather-Related Hazard Solution

Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. (Cause and Effect)

Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind-resistant roofs, and lightning rods.

Assessment Boundary: None

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.

480L

Name: _____ Date: _____

Amphibious Homes

The most common natural **hazard** is flooding. Water flows onto the land. It covers places that are usually dry. Storms often cause floods.



Flooded house

Floods can bring lots of damage. Homes can be destroyed. People are often moved to safer places. Drowning is possible. Diseases can also spread. This happens when extra water just sits on the land. It's often hard to get help to people in flooded areas.

We can't get rid of floods. We can be better prepared for them, though. Scientists study patterns in **weather** and **climate**. They are able to find areas in danger of flooding.

One **solution** is building **amphibious** homes. These homes rest on the ground. They rise up when there is a flood. The house floats like a boat. The house lowers back to the land once the waters are gone. These homes cost more than regular houses. It's worth the extra money for people living in flood areas.



There are a few bad sides to these homes. Owners don't have control over the house rising. The house may not stay level when it rises. The system that makes the house float must also be checked often. These homes are still a smart solution.

The number of floods is growing. They are getting stronger, too. Building different kinds of homes is one way to help. Living in areas where floods occur would be less risky.

©Julio Bochoso

Amphibious Homes Questions

1. Use the chart below to describe the problem and solution described in the article.

Problem	Solution
The most common natural hazard is flooding. It can damage and even destroy homes.	

2. What kinds of areas would benefit from these types of homes? What data do scientists need to track? Describe the weather there.

---

3. What are the downsides to this solution? Do you think the solution is effective at solving the problem? Why or why not? Give examples from the text to support your answer.

©Julia Bochoso

790L

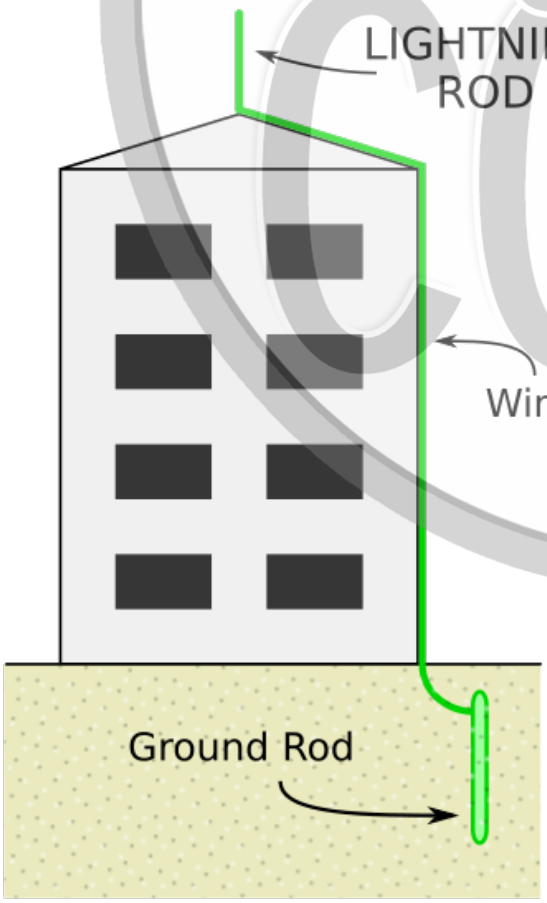
Name: _____ Date: _____

Lightning Rods

According to the National Weather Service, more than 23 million cloud-to-ground lightning strikes occur in the United States each year. Lightning is a flash of electricity that happens during a thunderstorm. Frozen raindrops bump into each other in thunderclouds. This builds up electric charges. Positive charges form at the top of the cloud. Negative charges form at the bottom. A positive charge also builds up on the ground beneath the cloud. When charges from the cloud and the ground connect, a lightning strike occurs. It travels at the speed of light (186,000 miles per second). Lightning usually strikes the tallest object, but this isn't always the case. Lightning can also strike the same spot more than once.



Lightning Strike



Lightning Rod Diagram

One **hazard** of concern is lightning striking buildings. Lightning heats the air it passes through to 50,000°F. That temperature is hotter than the surface of the sun! This means a bolt of lightning can cause a fire when it strikes a building. It can flow through metal pipes found in plumbing. Lightning can also travel through electrical wires. A power surge from a lightning strike has millions of **volts**. It's capable of frying expensive electronic equipment with that much power.

©Paige Bachus

Lightning rods are one **solution** to prevent damage caused by a lightning strike. Lightning rods are metal rods attached to the tops of buildings. They are made of metals that **conduct** electricity such as copper. These rods are connected to a wire system. That wire system runs all the way to the ground. Lightning rods don't stop lightning strikes. Instead, they give the lightning a safe route to travel. The ground absorbs the powerful electric charge. The building is protected from a direct lightning strike and the dangers it can bring.

Lightning rods must be installed by professionals. Incorrectly grounded rods can bring risks beyond those caused by lightning strikes. This solution can also be costly. Lightning rods can be customized to specific buildings, though. They also don't take up much space. That makes them an attractive option for protecting against lightning strikes.

©Julia Bachosa

Lightning Rods Questions

1. Use the chart below to describe the problem and solution described in the article.

Problem	Solution

2. What kinds of areas would benefit from this solution? What data do scientists need to track? Describe the weather there.

---

3. What are the downsides to this solution? Do you think the solution is effective at solving the problem? Why or why not? Give examples from the text to support your answer.

©Julia Bochoso

500L

Name: _____ Date: _____

Levees

Hurricanes are powerful storms. They have high winds. Warm, moist air rises over the water. Cooler air then takes its place. Storm clouds form as the air circles over the water. They grow until a hurricane forms. Wind speeds can be between 75 to 200 miles per hour.



Aerial view of a hurricane

Rain, winds, and waves come with a hurricane. **Storm surges** can be the most damaging part. A storm surge pushes water onto the land. It causes flooding. Flooding destroys buildings. It ruins animal habitats. It kills people and wildlife. Beaches get worn down. Most of the problems during a hurricane happen due to flooding.

Hurricanes are predictable. **Meteorologists** warn people. These people can then prepare. They can leave the area before the hurricane hits. This doesn't save their homes, though. **Levees** are one **solution**. They have worked in the Netherlands. They held back the North Sea. Builders want to bring levees to the United States.



Levee at a beach in France

A levee is a wall. It keeps water from going where it isn't wanted. A levee keeps storm surges from dumping water onto the coast. Natural levees are made of earth. Banks along the water hold it back. Levees made by people are built by piling up soil, sand, or rocks. They may also be made of wood or plastic. Sometimes metal or concrete is used.

Levees do a good job of protecting the coast... when they work. Flooding can still occur if they break. The water may then head on a more dangerous path. The best systems use levees with other structures such as gates.

©Julie Bochese

Levees Questions

1. Use the chart below to describe the problem and solution described in the article.

Problem	Solution
Hurricanes can cause storm surges and flooding that destroys homes and habitats.	

2. What kinds of areas would benefit from this solution? What data do scientists need to track? Describe the weather there.

---

3. What are the downsides to this solution? Do you think the solution is effective at solving the problem? Why or why not? Give examples from the text to support your answer.

©Julia Bochoso

490L

Name: _____ Date: _____

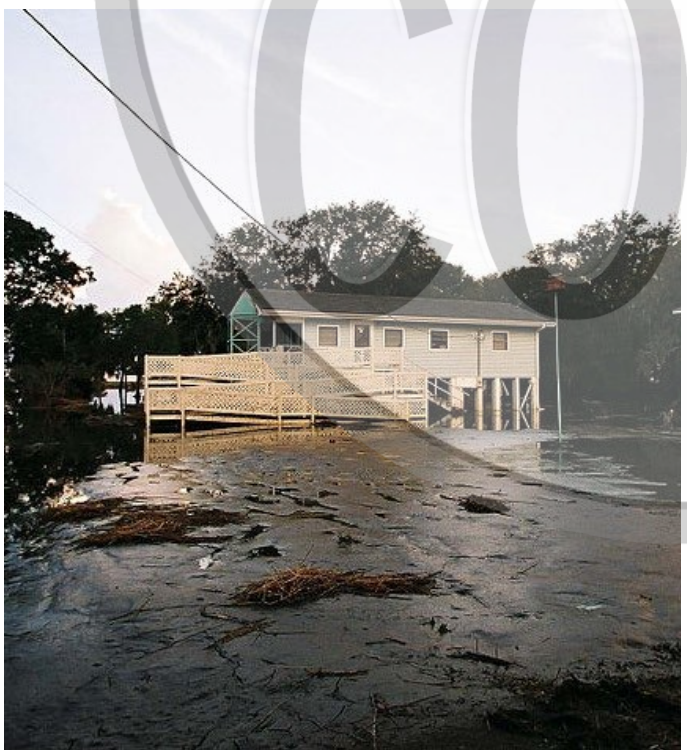
Stilt Houses

Many people can't resist living near the ocean. They love looking at the water. The sound of the waves relaxes them. The climate is perfect for enjoying the beach. This makes people want to build homes near the water. The only trouble is that sometimes the coasts can be dangerous.



Stilt house on beach in California

Storms such as **hurricanes** often beat up the coastline. Rains pound the land. Winds rip through the area. Waves crash onto the shore. They send water gushing where people have built their lives. These storms cause destruction when they hit. Areas get damaged by the wind, rain, and flooding. Human and animal lives are often lost. Hurricanes can be predicted. They can't be stopped, though. What people can do instead is plan.



House that avoided hurricane damage because of stilts

One **solution** is building **stilt** houses. These homes are raised off the ground. The house is built on top of support stakes called piles. These are made from wood. The wood is **resistant** to water. They are driven right into the water or land. Concrete is often poured around the piles for added support. A deck is made on top of the piles. The house is built on the deck. Stilt houses usually rest 10-12 feet off the ground. This allows for high tide. They are designed to avoid water damage.

©Julio Bochoso

Stilt houses have many **benefits**. They are easy to construct. These houses can be built in places where other houses can't. Being higher off the ground keeps the house safe from more than just flooding. Unwanted animals are kept out. Air can flow under the house. This keeps the house cooler in hot climates. It also allows the house to take wind gusts. A stilt house is up higher. It can offer owners a better view.

Professionals must be hired to build these homes. Support problems might happen if they aren't built correctly. The right materials also need to be used. These will prevent water damage and cracking. The heights of the pilings must be right, too. Stilt houses are one way for people to enjoy living on the coast.

©Julia Bachosa

Stilt Houses Questions

1. Use the chart below to describe the problem and solution described in the article.

Problem	Solution
Houses on the beach have to stand up to wind, waves, and flooding from storms.	

2. What kinds of areas would benefit from this solution? What data do scientists need to track? Describe the weather there.

---

3. What are the downsides to this solution? Do you think the solution is effective at solving the problem? Why or why not? Give examples from the text to support your answer.

©Julia Bochoso

Terms of Use

How Can I Use This Resource?

Thank you for trusting MagiCore. Our mission is to create resources that support teachers and promote student success. Please note that this resource is licensed for use by a single teacher in a classroom setting. If you need to use this resource with more than one teacher and/or across multiple classrooms, additional licenses are available at a discount. You can purchase additional licenses by visiting your TPT "Purchases" page and then selecting "Download Additional Licenses" or by contacting me at julie@magicorelearning.com.



Good to Go

- Use this resource personally or with your own children.
- Use this resource in your own classroom with your students.
- Provide this resource to your students to use at your instruction.
- Print and/or copy for use in your own classroom.
- Provide printed pages to a substitute teacher with the sole purpose of instructing your students.
- Share with your students via a secure document portal or electronic learning platform that requires individual user verification and limits access to only the students in your own classroom (e.g. Google Classroom).
- Review this resource with others with the sole purpose of recommending it to others for purchase, provided you share one of the links below:

https://magicorelearning.com/

https://www.teacherspayteachers.com/Store/Magicore



Not O.K.

- Share with others to use personally.
- Share with others to use in another classroom.
- Print or copy any page(s) and distribute them to other teachers or other classrooms.
- Publish or host online in a manner where any of the material is accessible to anyone who is not a student in your own classroom., including but not limited to personal, classroom, or district websites that are accessible to the general public.
- Use this resource commercially (e.g. Outschool).
- Publish, sell, or otherwise distribute this product to anyone in manner inconsistent with these terms of use.

© Copyright 2022. All rights reserved. The unlicensed reproduction or distribution of this product is strictly prohibited. Permission is granted to the original purchaser or licensee to make copies to use with students and/or to assign to students digitally providing it is only available to students assigned directly to the purchaser. Placing this product in any manner that makes it accessible to the general public is strictly forbidden. Commercial use, including but not limited to online or in person classes, is prohibited. Contact julie@magicorelearning.com for commercial licensing information. Sharing without permission or hosting online in a public manner is a violation of the Digital Millennium Copyright Act (DMCA). These terms may be updated at any time. You can see the most up to date Terms of Use at https://magicorelearning.com/terms-of-use.

Let's Connect!

www.magicorelearning.com

https://www.teacherspayteachers.com/Store/magicore

https://www.facebook.com/MagiCoreLearning/

https://www.instagram.com/magicorelearning/

https://www.pinterest.com/cckingdom/pins/

Julie@magicorelearning.com

Looking for more?





Membership Opportunity!

If you love these resources and want access to more, check out my membership opportunity with the Core Kingdom Club.

[Join my MagiCore Club waitlist!]

MagiCore Club opens its membership doors twice a year to offer teachers all the resources you love, with a membership discount. You can also find support through my custom learning plan.

Find out more https://magicorelearning.com/membership



CREDITS

David Stanley from Nanaimo, Canada, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons

Shirehorse at the English Wikipedia, CC BY-SA 3.0 <http://creativecommons.org/licenses/by-sa/3.0/>, via Wikimedia Commons

Marc Dalmulder, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons

Colorado State University Libraries, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons

Simeen23, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons

Christopher Michel, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons

Mtpaley, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons