

NATURAL HAZARDS

Science Reading

Scroll Through

To take a peek inside!

Natural Hazards

Predicting Natural Hazards
Scientists use technology to monitor and predict these events. By analyzing patterns in past events, time data, and using advanced forecasting tools, scientists can improve early warning systems to property.

Earthquakes and Volcanoes
Have you ever wondered why the ground shakes during an earthquake or why a volcano erupts? These powerful events are caused by forces deep within the Earth. Let's explore how these natural processes work and how scientists use technology to predict them.

Typhoons and Floods
Water Typhoons and floods are two of the most powerful and destructive natural events on Earth. They can cause widespread damage, disrupt communities, and pose serious risks to people and the environment. But what exactly causes these events, and why are they so dangerous?

Tornadoes and Hurricanes
Tornadoes and hurricanes are two of the most powerful natural forces on Earth. They can cause immense damage and pose serious risks to people and the environment. But what exactly causes these storms, and why are they so dangerous?

Reading Passages

Notes

Worksheets

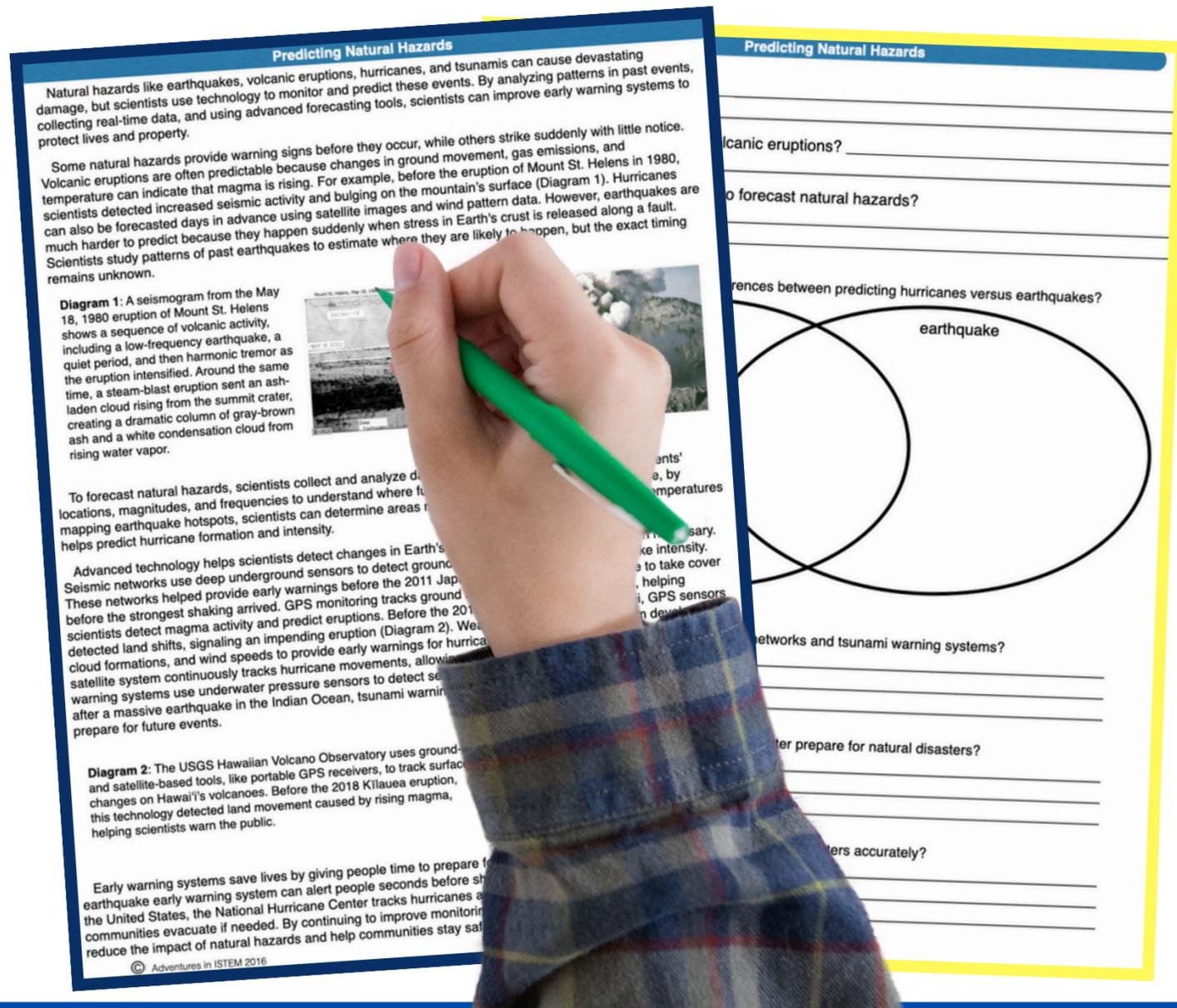
Task Cards

Readings with Questions

Help students learn about the about the different types of natural hazards that can affect them and how to predict them and then test their comprehension with these easy to read science reading passages.

NATURAL HAZARDS

Science Reading



Topics Included

- Predicting Natural Hazards
- Volcanoes and Earthquakes
- Hurricanes and Tornadoes
- Typhoons and Floods

Each topic *includes*

- ✓ **One page science reading passage to teach the topic.**
- ✓ **Notes with questions to guide their reading**
- ✓ **Comprehension worksheets to review the information using multiple levels of questioning**
- ✓ **Task cards to extend their learning and for extra review**
- ✓ **Answer keys to easily check the student knowledge**
- ✓ **Digital version for more flexibility on how to use the lesson**
- ✓ **Lesson Design to help you differentiate the lesson in your classroom**

Earthquakes and Volcanoes

Class: _____
Date: _____

Define / Describe:

1. What causes an earthquake? _____
2. How do volcanoes form? _____
3. What is magma? _____
4. What is a fault line? _____

Compare:

5. What are some similarities and differences between earthquakes and volcanoes?

earthquake	Both	volcano
Add text	Add text	Add text

Have you ever wondered why the ground shakes during an earthquake or why a volcano erupts? These powerful events are caused by forces deep within the Earth. Let's explore how these natural processes work and how scientists use technology to predict them.

Earthquakes occur when there is a sudden release of energy in the Earth's crust, usually caused by tectonic plates—huge sections of the Earth's surface—pushing against each other. As pressure builds along a fault line, it is eventually released in the form of seismic waves, causing the ground to shake. These natural events can be incredibly destructive, as seen in the 2011 Japan earthquake that triggered a massive tsunami and the 2015 earthquake in Nepal (Diagram 1), which caused widespread damage and loss of life across the region. To better understand and prepare for earthquakes, scientists use seismometers to detect and measure seismic waves and determine the location and strength of a quake. GPS and satellite monitoring also help track ground movement and shifts along fault lines, providing valuable information for studying and issuing early warnings in earthquake-prone areas.

Diagram 1: The 2015 earthquake in Nepal caused widespread devastation as powerful shaking led to the collapse of buildings, temples, and homes across the region. In cities like Kathmandu, historic structures crumbled and modern buildings were reduced to rubble, leaving streets filled with debris and dust. The destruction was sudden and severe, highlighting the deadly impact of powerful earthquakes in densely populated areas.

Volcanoes result from tectonic activity and form within the Earth's crust. This magma gathers in a magma chamber, and it erupts through a vent as lava, ash, and gas. Some volcanoes, such as those that erupted in 1980, are explosive, while others, such as Hawaii's Kilauea, have flowing lava flows. Scientists use tiltmeters and thermometers to monitor volcanoes, and they use gas sensors to track rising levels of sulfur dioxide and carbon dioxide. The 1991 eruption of Mount Pinatubo in the Philippines, which produced massive ash and gas emissions, which helped them issue timely warnings and save thousands of lives.

Diagram 2: Hawaii's Kilauea volcano is one of the world's most active volcanoes, and its flowing lava can often be seen pouring into the ocean along the island's coast. As the hot lava meets the cool seawater, it creates huge plumes of steam and adds new land to the shoreline. This dramatic display shows the powerful and ongoing process of land formation in Hawaii.

Earthquakes and volcanoes are powerful natural events. While earthquakes remain difficult to predict, we can learn where they will likely occur. Volcanoes, on the other hand, are easier to predict, allowing scientists to alert communities. Advances in technology are helping scientists to study and prepare for these natural disasters.

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Notes

Define / Describe:

1. What causes an earthquake? Add text
2. How do volcanoes form? Add text
3. What is magma? Add text
4. What is a fault line? Add text
7. How do scientists use past earthquake data to assess future risks? Add text
8. What are some challenges in developing more accurate earthquake prediction systems? Add text

Compare / Contrast:

earthquake	Both	volcano
Add text	Add text	Add text

Elaborate / Extend:

6. Why do some volcanoes have explosive eruptions while others have quiet eruptions? Add text

NATURAL HAZARDS

Science Reading

Tornadoes and Hurricanes

Tornadoes and hurricanes are two of the most powerful natural forces on Earth. They can cause immense damage and pose serious risks to people and the environment. But what exactly causes these storms, and why are they so dangerous?

Tornadoes are violent, rotating columns of air that extend from a thunderstorm to the ground, forming when warm, moist air near the surface rises quickly and meets cooler, dry air above. This difference in temperature and humidity creates a spinning effect in the atmosphere, and if the rotation intensifies, a tornado can develop with powerful winds capable of destroying buildings, uprooting trees, and tossing heavy objects. Tornadoes are most common in Tornado Alley in the central United States (Diagram 1), but they also occur in other regions, such as Argentina and Bangladesh. Because tornadoes form quickly, they are difficult to predict. Meteorologists use Doppler radar to monitor thunderstorms and detect rotation in storm clouds; for example, before the 2011 Joplin, Missouri tornado, radar identified strong rotation, allowing warnings to be issued just minutes before impact. Tornado sirens and emergency alerts play a key role in giving people time to seek shelter and stay safe.

Diagram 1: This map of the United States shows where tornadoes are most likely to occur, with the highest concentration in an area known as Tornado Alley. Tornado Alley includes parts of Texas, Oklahoma, Kansas, Nebraska, and South Dakota, where warm, moist air from the Gulf of Mexico meets cooler, dry air from the north, creating ideal conditions for tornado formation. Other states, like Missouri and Iowa, also experience frequent tornado activity.



TORNADO ACTIVITY IN THE UNITED STATES*
Summary of Reported EF3, EF4, and EF5 Tornadoes
Per 2,470 Square Miles (1950-2006)

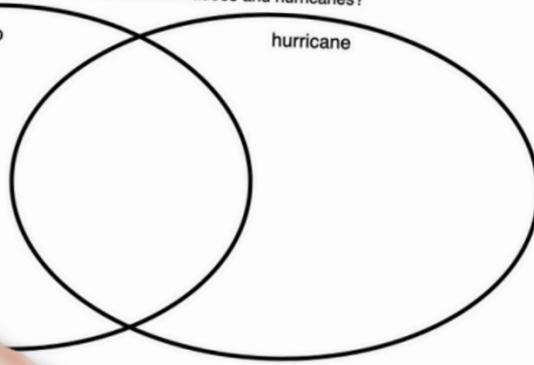
Hurricanes are massive storm systems that develop over warm ocean water. They rise and create a low-pressure system that begins to spin due to Earth's rotation. As the system's strength increases, it produces intense winds, heavy rain, and storm surges that can flood coastal areas. Hurricanes are the same type of storm as typhoons, but they are called "hurricanes" when they form in the Atlantic and Caribbean, and "typhoons" when they form in the Northwest Pacific. Unlike tornadoes, hurricanes can last for multiple days, especially during the Atlantic hurricane season from June to November. Hurricanes are most destructive in late summer and early fall. Because hurricanes develop over large areas, they are easier to track. Scientists use satellites, weather buoys, and computer models to monitor hurricanes (Diagram 2). For example, before Hurricane Katrina in 2005, forecasts warned of a major storm, leading to mass evacuations. In response, coastal communities often prepare by reinforcing buildings, and opening emergency shelters.

Diagram 2: This satellite image shows a large hurricane approaching the East Coast of the United States, with a well-defined eye and spiraling bands of clouds. The storm stretches over hundreds of miles, bringing strong winds, heavy rain, and the potential for coastal flooding.

Tornadoes and hurricanes are destructive natural events, but modern technology helps us understand them. While tornadoes can appear suddenly, advanced radar systems provide short-term warnings. Hurricanes, though longer-lasting, can be tracked in advance, allowing communities time to evacuate. Using early warning tools and taking early action, we can reduce the damage these powerful storms can cause.

Tornadoes and Hurricanes

What are the similarities and differences between tornadoes and hurricanes?



Which is more challenging than predicting hurricanes?

What are the factors that affect the intensity of hurricanes?

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What Are *students* Doing?

- ✓ **Marking the text**
- ✓ **Filling in the guided note-taking template**
- ✓ **Reviewing and applying their knowledge**
- ✓ **Reinforcing their understanding**

NATURAL HAZARDS

Science Reading

Typhoons and Floods

Define / Describe:

1. What is a typhoon?
2. How do typhoons develop?
3. What is a flash flood?

Compare:

4. What are some similarities and differences between typhoons and floods?

typhoon

Elaborate / Extend:

5. How might climate change impact typhoons?
6. How do computer models help?
7. What are some...

Typhoons and Floods

Water Typhoons and floods are two of the most powerful and destructive natural events on Earth. They can cause widespread damage, disrupt communities, and pose serious risks to people and the environment. But what exactly causes these events, and why are they so dangerous?

Typhoons are large, powerful storms that form over warm ocean waters when warm, moist air rises from the ocean's surface and begins to spin due to Earth's rotation. As the storm grows, it draws in more warm air, increasing its strength and bringing powerful winds, heavy rainfall, and dangerous storm surges that can cause significant damage, especially when the typhoon reaches land. Typhoons are the same type of storm as hurricanes, but they are called "typhoons" when they form in the Northwest Pacific and "hurricanes" when they form in the Atlantic or eastern Pacific. Countries in the Pacific Ocean region, including the Philippines, Japan, and China, regularly experience typhoons that often lead to flooding and other damage. Satellites like Himawari track typhoons in real time by monitoring wind speeds, air pressure, and cloud cover (Diagram 1). Doppler radar detects heavy rainfall and wind patterns, and forecasters use this information to forecast storm intensity and issue early warnings to keep people safe.

Diagram 1: This satellite image shows a typhoon over the ocean with a clearly defined eye and thick bands of clouds extending outward. The image highlights the storm's massive size, strong winds, and dense cloud cover, indicating heavy rainfall as the storm moves toward land.

Floods occur when water covers land that is usually dry, resulting from heavy rainfall, rapid snowmelt, or overflowing rivers. Some floods develop slowly over several days, while others, like flash floods, happen suddenly and can be extremely dangerous. Both types can cause major damage to homes, roads, and farmland, as seen in places like Bangladesh, where seasonal monsoon rains regularly lead to widespread flooding. To help predict and respond to these events, scientists use river gauge sensors, remote sensing technology, and satellite data from systems like the Global Flood Monitoring System. Computer models also analyze past floods and current weather conditions to forecast flood risks, allowing emergency responders to issue warnings and help communities prepare.

Diagram 2: This aerial image shows a striking contrast, with one side of the road completely flooded and water surrounding homes and yards, while the other side remains dry and untouched. The clear divide highlights how flooding can impact some areas severely while nearby spots are left unaffected, depending on elevation and drainage.

Technology also helps reduce the impact of these disasters. Automated alert systems send warnings via smartphones and emergency broadcasts, giving people time to evacuate. Drones assess damage and find stranded individuals after floods. As forecasting technology improves, communities can better prepare for and respond to these powerful natural hazards.

Typhoons and floods are powerful natural events that can have serious consequences. Understanding how they form and using advanced technology to predict them helps save lives. Satellites, radar, and flood monitoring systems provide crucial data that allows for early warnings and better preparation. As technology continues to improve, our ability to forecast and respond to these disasters will become even more effective, reducing their impact on people and communities.

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Different ways to use the science readings

- ✓ Substitute plan on days you will be out
- ✓ Introduction of the material at the beginning of the unit
- ✓ During the explain phase of the 5E model
- ✓ As part of a science station
- ✓ For reteach to reinforcing their understanding
- ✓ During the review at the end of the unit

Why? SCIENCE READING PASSAGES?

- ✓ Increase science literacy in the classroom
- ✓ Simple passages to help students comprehend the information
- ✓ Note-taking template to help students interact with the reading
- ✓ Worksheets to review and apply their knowledge
- ✓ Reinforcement task cards to continue their understanding



“My students and I absolutely loved this resource!!! The way this was planned out with the reading, diagrams, and questions was perfect. I mainly used this with my students but they used it one day with a substitute and they wrote to tell me how great it was! (I think they thought I created it so I have to tell them otherwise!)” -

Nicole

NATURAL HAZARDS

Science Reading

Predicting Natural Hazards **Answer Key**

Define / Describe:

1. What is a natural hazard? A dangerous natural event like an earthquake, hurricane, or tsunami.
2. How do scientists predict volcanic eruptions? By monitoring ground movement, gas emissions, and temperature changes.
3. What data do scientists use to forecast natural hazards? Scientists use data such as past event patterns, ground movement, seismic activity, gas emissions, ocean temperatures, and satellite imagery to predict natural hazards.

Predicting Natural Hazards

Natural hazards like earthquakes, volcanic eruptions, hurricanes, and tsunamis can cause devastating damage, but scientists use technology to monitor and predict these events. By analyzing patterns in past events, collecting real-time data, and using advanced forecasting tools, scientists can improve early warning systems to protect lives and property.

Some natural hazards provide warning signs before they occur, while others strike suddenly with little notice. Volcanic eruptions are often predictable because changes in ground movement, gas emissions, and temperature can indicate that magma is rising. For example, before the eruption of Mount St. Helens in 1980, scientists detected increased seismic activity and bulging on the mountain's surface (Diagram 1). Hurricanes can also be forecasted days in advance using satellite images and wind pattern data. However, earthquakes are much harder to predict because they happen suddenly when stress in Earth's crust is released along a fault. Scientists study patterns of past earthquakes to estimate where they are likely to happen, but the exact timing remains unknown.

Diagram 1: A seismogram from the May 18, 1980 eruption of Mount St. Helens shows a sequence of volcanic activity, including a low-frequency earthquake, a quiet period, and then harmonic tremor as the eruption intensified. Around the same time, a steam-blast eruption sent an ash-laden cloud rising from the summit crater, creating a dramatic column of gray-brown ash and a white condensation cloud from rising water vapor.



To forecast natural hazards, scientists collect and analyze data to identify trends. They study past events' locations, magnitudes, and frequencies to understand where future disasters might occur. For example, by mapping earthquake hotspots, scientists can determine areas most at risk. Similarly, tracking ocean temperatures helps predict hurricane formation and intensity.

Advanced technology helps scientists detect changes in Earth's systems and predict natural hazards. Seismic networks use deep underground sensors to detect ground shaking. These networks helped provide early warnings before the 2011 Japan earthquake. GPS monitoring tracks ground movement before the strongest shaking arrived. Before the 2018 Kilauea eruption, scientists detected magma activity and predict eruptions. Weather satellites detect land shifts, signaling an impending eruption (Diagram 2). Weather satellites also detect cloud formations, and wind speeds to provide early warnings for hurricanes. The satellite system continuously tracks hurricane movements, allowing meteorologists to predict the exact timing of storms. Changes in ocean temperatures can affect warning systems use underwater pressure sensors to detect seismic activity after a massive earthquake in the Indian Ocean, tsunami warning systems were used to help communities prepare for future events.

Diagram 2: The USGS Hawaiian Volcano Observatory uses ground- and satellite-based tools, like portable GPS receivers, to track surface changes on Hawaii's volcanoes. Before the 2018 Kilauea eruption, this technology detected land movement caused by rising magma, helping scientists warn the public.



Early warning systems save lives by giving people time to prepare for disasters. For example, Japan's earthquake early warning system can alert people seconds before shaking begins, allowing them to take cover. In the United States, the National Hurricane Center tracks hurricanes and issues warnings days in advance, helping communities evacuate if needed. By continuing to improve monitoring and prediction technologies, scientists can reduce the impact of natural hazards and help communities stay safe.

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Check out what teachers just like you have said about the science reading products:



“I love using reading passages in my science classes because I am able to reinforce all the learning strategies they have learned in the past and give the students more understanding of the information provided.” – Suzzane



“I was really glad to find a bundle that included so many of our objectives since we do not have a curriculum” – Amanda



“This article kept my 8th graders engaged while reviewing this topic” Brower Power Science

HOW TO USE THE RESOURCE IN

3 simple steps

1

Print the PDF version, make copies, and hand out to students

2

Use the digital version by clicking the titles in the RED BOX to make your own copy (found at the end of the PDF)

3

Share the resource with your students using your favorite LMS (Google Classroom, Powerschool (schoolology), Canva...)

Interactive Digital Flip Book

Teachers Guide

What You Will Need To Get Started:

1. Download link for the Google Resource by clicking on the titles in the red box

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3. Google accounts or Microsoft OneDrive accounts for your students to save their work
4. Open the file on your Google Drive. The link will prompt you to make a copy

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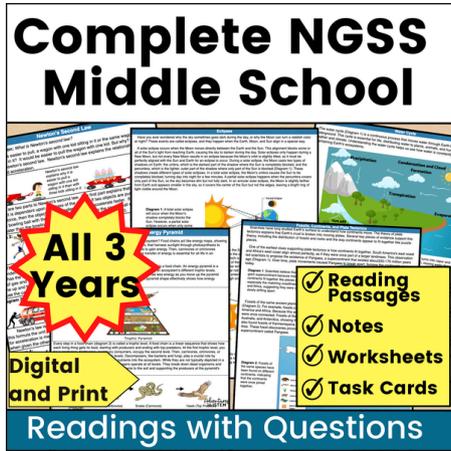
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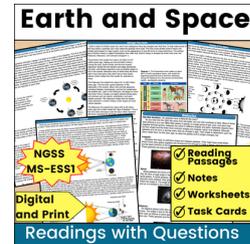
- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

Readings with Questions

Earth Science Standards

Earth and Space



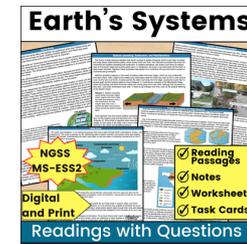
NGSS MS-ESS1

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

Readings with Questions

Earth's Systems



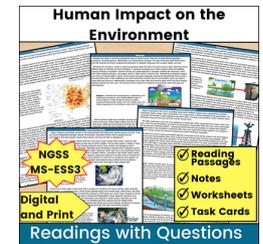
NGSS MS-ESS2

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

Readings with Questions

Human Impact on the Environment



NGSS MS-ESS3

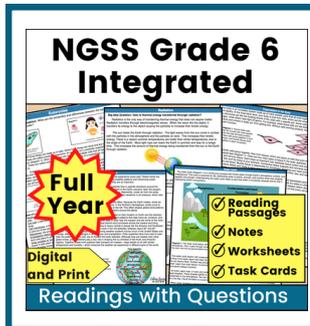
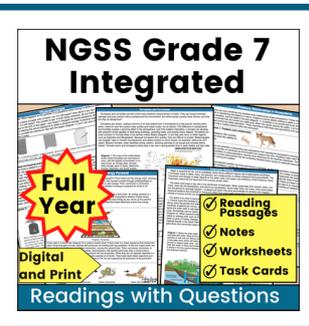
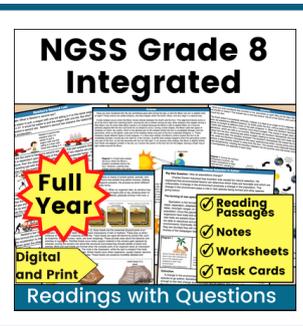
- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

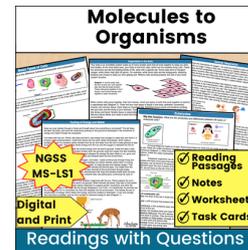
Readings with Questions

Life Science Standards

Integrated Model by Grade Level

<h3>NGSS Grade 6 Integrated</h3>  <p>Full Year</p> <ul style="list-style-type: none">✓ Reading Passages✓ Notes✓ Worksheets✓ Task Cards <p>Digital and Print</p> <p>Readings with Questions</p>	<h3>NGSS Grade 7 Integrated</h3>  <p>Full Year</p> <ul style="list-style-type: none">✓ Reading Passages✓ Notes✓ Worksheets✓ Task Cards <p>Digital and Print</p> <p>Readings with Questions</p>	<h3>NGSS Grade 8 Integrated</h3>  <p>Full Year</p> <ul style="list-style-type: none">✓ Reading Passages✓ Notes✓ Worksheets✓ Task Cards <p>Digital and Print</p> <p>Readings with Questions</p>
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Molecules to Organisms



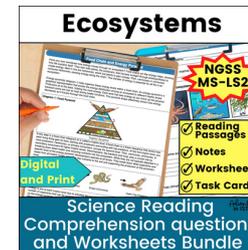
NGSS MS-LS1

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

Readings with Questions

Ecosystems



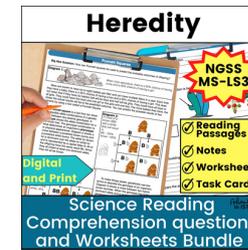
NGSS MS-LS2

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

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Heredity



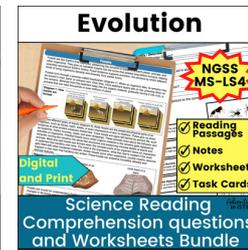
NGSS MS-LS3

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
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Evolution



NGSS MS-LS4

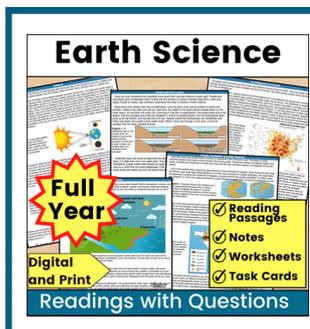
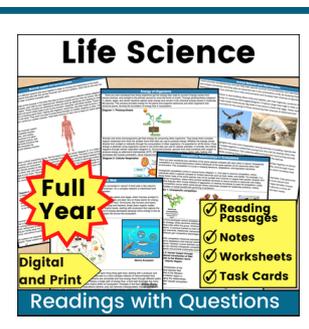
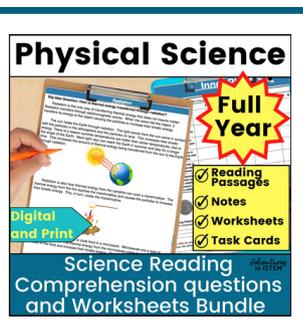
- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

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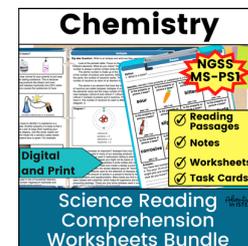
Science Reading Comprehension questions and Worksheets Bundle

Physical Science Standards

Alternative Model by Topic

<h3>Earth Science</h3>  <p>Full Year</p> <ul style="list-style-type: none">✓ Reading Passages✓ Notes✓ Worksheets✓ Task Cards <p>Digital and Print</p> <p>Readings with Questions</p>	<h3>Life Science</h3>  <p>Full Year</p> <ul style="list-style-type: none">✓ Reading Passages✓ Notes✓ Worksheets✓ Task Cards <p>Digital and Print</p> <p>Readings with Questions</p>	<h3>Physical Science</h3>  <p>Full Year</p> <ul style="list-style-type: none">✓ Reading Passages✓ Notes✓ Worksheets✓ Task Cards <p>Digital and Print</p> <p>Science Reading Comprehension questions and Worksheets Bundle</p>
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Chemistry



NGSS MS-PS1

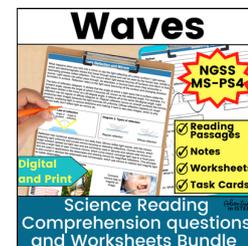
- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

Science Reading Comprehension Worksheets Bundle

Chemistry also includes thermal energy

Waves



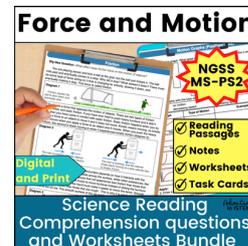
NGSS MS-PS4

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

Science Reading Comprehension questions and Worksheets Bundle

Force and Motion



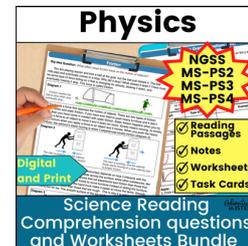
NGSS MS-PS2

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

Science Reading Comprehension questions and Worksheets Bundle

Physics



NGSS MS-PS2, MS-PS3, MS-PS4

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Digital and Print

Science Reading Comprehension questions and Worksheets Bundle

Physics includes mechanical energy



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