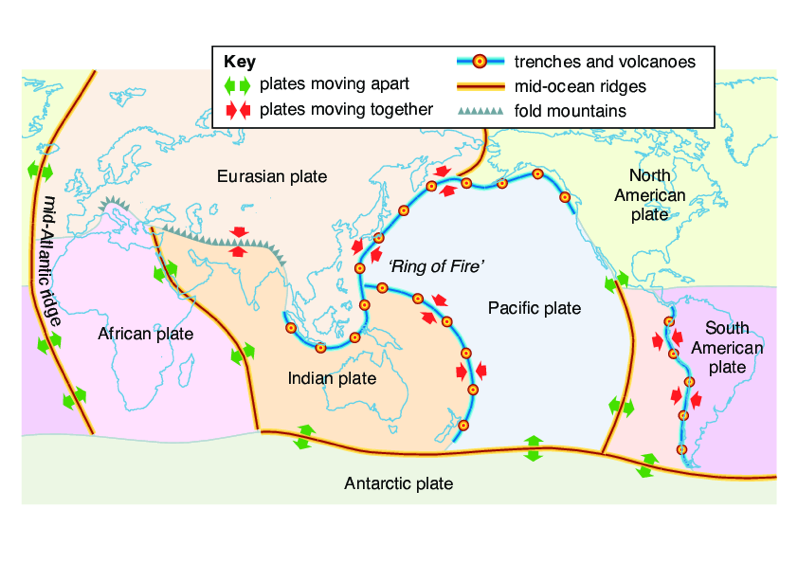
**Guided Notes: Tracking Earthquakes**

**Big Idea:** Scientists use seismic data from instruments like seismographs to identify areas prone to earthquakes and volcanic activity.

**Key Concepts:**

* An \_\_\_\_\_\_\_\_\_\_\_\_ is the part of Earth's surface directly above where an earthquake began.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is a tremor preceding a larger earthquake.
* \_\_\_\_\_\_\_\_\_\_\_\_ is the effect of an earthquake on Earth's surfaces, humans, and structures.
* \_\_\_\_\_\_\_\_\_\_\_\_ is a measure of the maximum motion or energy released by an earthquake.
* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ rates earthquakes by measuring the total amount of energy released.
* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ describes the effects of an earthquake based on observations of shaking and damage.
* \_\_\_\_\_\_\_\_\_\_\_\_ are waves that push or pull particles in the direction the wave is traveling.
* \_\_\_\_\_\_\_\_\_\_\_\_ are waves that shake particles at right angles to the direction the wave is traveling.
* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ are waves that travel along the surface of Earth.



**Real World Examples:**

1. Video Games: Many games involve knocking opponents off platforms. Characters initially resist changes to their motion until hit by an unbalanced force, similar to how earthquakes occur from built-up forces.

2. Tsunami Buoys: Just like seismic stations detect earthquakes, tsunami buoys placed in oceans around the world help track tsunami wave movements to better warn coastal areas.

**Guided Notes: Volcanic Eruptions**

**Big Idea:** Scientists cannot prevent volcanic eruptions, but people can take steps to mitigate (reduce) their effects to prevent loss of life and property.

**Key Concepts:**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are scientists who study volcanoes.
* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an instrument used to measure vibrations inside Earth.
* The \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ is a geographic location where a lot of earthquake and volcanic activity occurs.
* \_\_\_\_\_\_\_\_\_\_ is fine particles of rock from a volcano.
* \_\_\_\_\_\_\_\_\_\_ is the act of reducing loss of life or property from natural hazards.
* \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ is equipment used to minimize exposure to hazards.



**Real World Examples:**

1. In 1980, there were warning signs like \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and earthquakes that Mount St. Helens was going to erupt. Volcanologists ordered people to leave the area, which helped prevent more loss of life when it did erupt on May 18, 1980.
2. If you live near a volcano, you should have an emergency "go-bag" ready with supplies like food, water, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and other essentials in case you need to evacuate quickly. Following instructions from officials can help \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the risk.

**Guided Notes: Tracking Hurricane Dorian**

**Big Idea:** Understanding how hurricanes are tracked and their intensity is predicted to mitigate their devastating effects.

**Key Concepts:**

* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ is a measure of air pressure in the atmosphere.
* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is the apparent curve of winds or objects due to Earth's rotation.
* The \_\_\_\_\_\_\_\_\_\_\_\_ is the region of calm weather at the center of a hurricane.
* The \_\_\_\_\_\_\_\_\_\_\_\_ is a band of very strong winds surrounding the eye of a hurricane.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is a tropical storm with winds of 119 kph (74 mph) or greater that also has rain.
* \_\_\_\_\_\_\_\_\_\_\_\_ refers to reaching land.
* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a rating scale for hurricanes that uses wind speed.
* A \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is an abnormal rise of water generated by a storm.
* A \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a weak storm with sustained winds of 61 kph (38 mph) or less.
* A \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a storm with winds of 62–117 kph (about 39-73 mph) or less that also has rain.
* A \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is an area of low pressure that moves from east to west.



Hurricanes form over warm ocean water. Source: Tomas Griger/123RF

**Real World Examples:**

1. When Hurricane Dorian made landfall in the Bahamas as a Category 5 storm, it caused catastrophic damage, destroying many homes and leaving areas uninhabitable for weeks or months due to its extremely high winds of 185 mph, as predicted by the \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_.

2. As Hurricane Dorian approached the eastern coast of the United States, meteorologists used data on\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_, wind speed, and the storm's path to predict its intensity and potential impact, allowing government agencies and first responders to prepare and warn residents in affected areas.

**Guided Notes: Learning From Hurricane Katrina**

**Big Idea:** Learning from past failures in hurricane response can lead to better preparation and mitigation of future hurricane impacts.

**Key Concepts:**

* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_is a special form of radar that uses echoes from radio waves to track air movement inside a storm.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is a storm with winds of 118 kph (about 74 mph) or greater that also has rain.
* \_\_\_\_\_\_\_\_\_\_\_\_ refers to reaching land.
* \_\_\_\_\_\_\_\_\_\_\_\_ are walls of earth designed to regulate water levels.
* \_\_\_\_\_\_\_\_\_\_\_\_ is the act of reducing loss of life or property from natural hazards.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is a fictional disaster used to evaluate the effectiveness of a response.
* A \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is an abnormal rise of water generated by a storm.



**Real World Examples:**

1. During Hurricane Katrina in 2005, the \_\_\_\_\_\_\_\_\_\_ system protecting New Orleans failed, leading to catastrophic flooding in the city. This highlighted the need for stronger and better-maintained levees to mitigate the effects of future hurricanes and storm surges.

2. After the failures in the response to Hurricane Katrina, government agencies and first responders learned the importance of effective communication, proper evacuation planning, and having emergency supplies and personnel readily available to help people quickly after a hurricane strikes.

**Guided Notes: Using Data to Predict Wildfires**

**Big Idea:** Using various data sources and technologies can help predict and mitigate the impacts of wildfires.

**Key Concepts:**

* \_\_\_\_\_\_\_\_\_\_\_\_ is the criminal act of deliberately setting a fire.
* \_\_\_\_\_\_\_\_\_\_\_\_ means in the direction the wind is blowing.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is a period of abnormally low rainfall.
* \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ is a weather pattern that causes unusually warm ocean temperatures in the Pacific Ocean.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is a prediction about a future event.
* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_are strong, hot, dry winds that originate inland and move toward the coast.
* \_\_\_\_\_\_\_\_\_\_\_\_ refers to the plant species that cover the ground.



**Real World Examples:**

1. During the 2018 Camp Fire in Northern California, a combination of \_\_\_\_\_\_\_\_\_\_ conditions, dry vegetation, and strong Santa Ana winds allowed the fire to spread rapidly, destroying the town of Paradise within hours.

2. Meteorologists use data from satellites, radar, and other technologies to forecast drought conditions and predict areas at high risk for \_\_\_\_\_\_\_\_\_\_, allowing officials to prepare and warn residents in those areas.

**Guided Notes: Mitigating the Effects of Wildfires**

**Big Idea:** Using various technologies and mitigation strategies can help reduce the devastating effects of wildfires.

**Key Concepts:**

* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ are planned fires set to manage forests.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is a period of abnormally low rainfall.
* To \_\_\_\_\_\_\_\_\_\_\_\_ means to make something less severe.
* A \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is an area around a building where vegetation and combustible materials are cleared to prevent wildfire spread.
* \_\_\_\_\_\_\_\_\_\_\_\_ refers to cutting down and removing smaller and younger trees in a forest.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is an unplanned and unwanted fire.



**Real World Examples:**

1. After devastating wildfires in recent years, many communities in wildfire-prone areas are now requiring homeowners to create \_\_\_\_\_\_\_\_\_\_ spaces around their properties by clearing brush and combustible materials within a certain perimeter of the home. This provides a buffer to help stop or slow the spread of wildfires.

2. In areas with high wildfire risk, utility companies are increasingly using technology like weather monitoring stations, cameras, and drone inspections to proactively identify potential wildfire hazards like dead trees or vegetation too close to power lines. They can then mitigate these risks through vegetation management programs before a fire starts.