31.1 Earth 31 Wind & Waves!

Earth Science

Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction

Summarize your understanding of each paragraph.

All of us have experienced wind since our youth. Even so, we do not often think about how wind happens, why it blows fast and slow, and what influences its direction. There are dozens of answers to each of these questions. Three concepts are covered below.

(1) The Coriolis effect. This is a physical phenomena related to motion. The effect is named after a French mathematician's work in the early 1800's. This effect happens with a rotating body. In this instance, Earth is the rotating body.

(2) Jet streams. These winds happen in the upper part of the troposphere (about 7 miles or 11 kilometers about Earth's surface). There are polar jet streams and subtropical jet streams. Temperature differences from Earth's angle and the Sun effect these.

(3) Local winds. These are the winds most people are familiar with. These happen on a much smaller scale than the global winds. Factors influencing local winds are temperature and density difference of air. Air above land and water usually differ.

Read/Summarize Text

1. **Read the passage.**
2. **Underline key expressions in each sentence.**
3. **Re-write each word (or expression) you underlined.**
4. **Summarize the passage.**

Coriolis effect and jet streams.

1

2

Jet streams are the product of two factors: atmospheric heating by solar radiation and the action of the Coriolis force acting on air moving masses. The Coriolis force is caused by the planet's rotation on its axis.

Location of jet streams help meteorologists forecast weather. An interesting fact about jet streams is they were first observed by scientists after the 1883 eruption of the Krakatoa volcano.

The first jet took flight in 1939 – so originally, the jet streams were called the "equatorial smoke stream"

Re-write words you underlined

3

_____ _____ _____

_____ _____ _____

Using a complete sentence, summarize or rephrase the passage

4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

What are the trade winds?

Early commerce to the Americas relied on the trade winds—the prevailing easterly winds that circle the Earth near the equator.

Known to sailors around the world, the trade winds and associated ocean currents helped early sailing ships from European and African ports make their journeys to the Americas. Likewise, the trade winds also drive sailing vessels from the Americas toward Asia. Even now, commercial ships use "the trades" and the currents the winds produce to hasten their oceanic voyages.

How do these commerce-friendly winds form? Between about 30 degrees north and 30 degrees south of the equator, in a region called the horse latitudes, the Earth's rotation causes air to slant toward the equator in a southwesterly direction in the northern hemisphere and in a northwesterly direction in the southern hemisphere. This is called the Coriolis Effect.

The Coriolis Effect, in combination with an area of high pressure, causes the prevailing winds—the trade winds—to move from east to west on both sides of the equator across this 60-degree "belt."

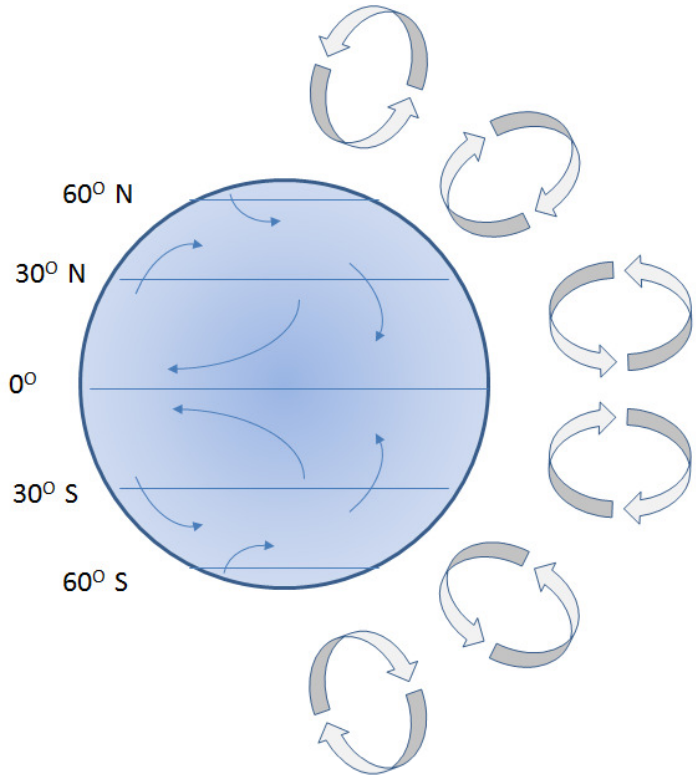
As the wind blows to about five degrees north and south of the equator, both air and ocean currents come to a halt in a band of hot, dry air. This 10-degree belt around Earth's midsection is called the Inter-Tropical Convergence Zone, more commonly known as the doldrums.

Intense solar heat in the doldrums warms and moistens the trade winds, thrusting air upwards into the atmosphere like a hot air balloon. As the air rises, it cools, causing persistent bands of showers and storms in the tropics and rainforests. The rising air masses move toward the poles, then sink back toward Earth's surface near the horse latitudes. The sinking air triggers the calm trade winds and little precipitation, completing the cycle.

NOAA. What are the trade winds? National Ocean Service website, https://oceanservice.noaa.gov/facts/tradewinds.html, 01/07/20

Draw Illustration

Copy and Label the Illustration in the Space Provided



Draw (Copy) the Illustration Here

Interpret a Graph

Write the title of the graph _____

Circle the type of chart this represents

Bar Chart *Line Chart* *Pie Chart* *Other*

If applicable,

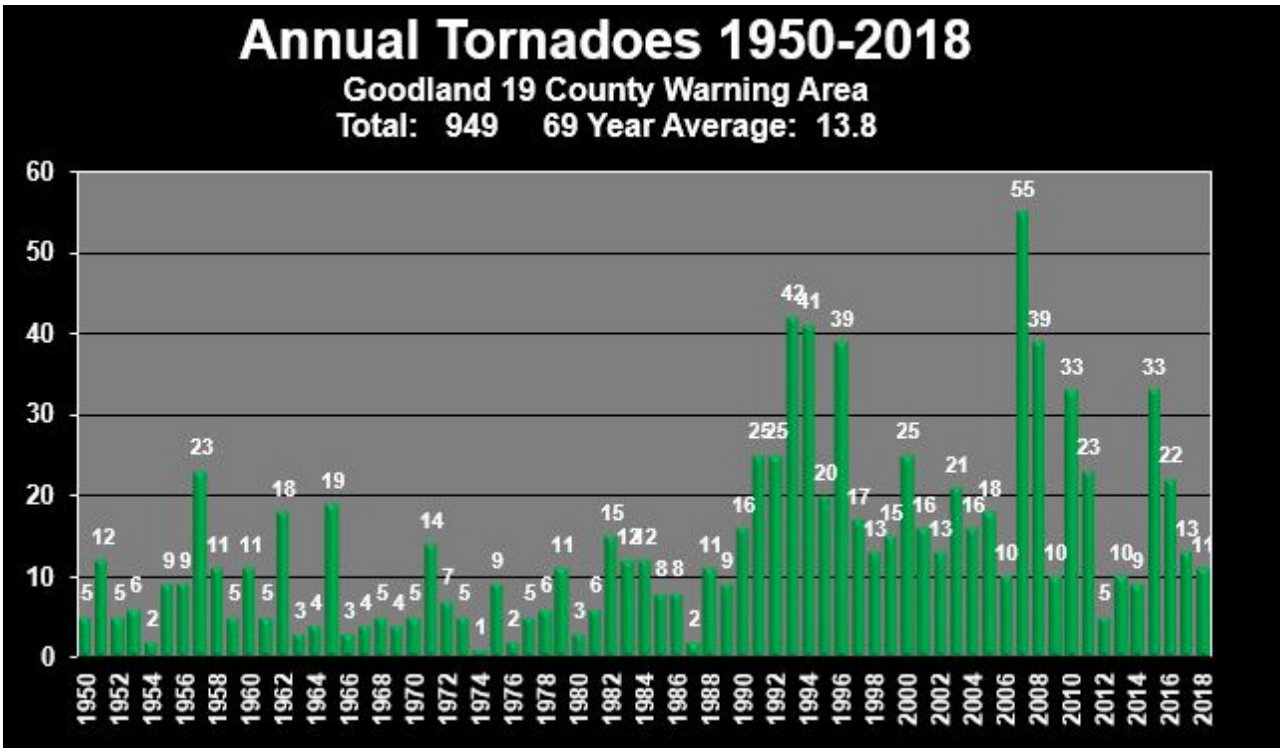
What does the X-axis represent _____

What does the Y-axis imply _____

Summarize what this graph represents or conveys

_____

https://www.weather.gov/gld/tornado-tornadographs



Show-Off Your Smarts!

Instructions

- Complete as an individual or small group.
- Discuss your ideas/answers/responses in a small group.
- Select one person to present your responses to the class.

Q1. How can this information be applied to a young-person's life?

Q2. How does this information apply to (or impact) communities?

Q3. When do scientists need to apply this information? How?

Q4. How would a person from 100 years ago view this information?

Q5. How does this topic connect to other science topics or math?

Write down at least three words introduced or covered by this topic.

1.
2.
3.
4.
5.
6.

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic.