

What are the differences between Thunderstorms, Tornadoes and Hurricanes?

What is the recipe for a thunderstorm?

- Read over!*
1. Earth heats unequally
 2. Warm air less dense, less pressure
 3. Cool air more dense, more pressure
 4. Wind forms as air moves from higher pressure towards lower pressure
 5. Warm air (heat) rises and collects water vapor. When it rises high enough it starts to cool
- Cool air (cool) condenses water vapor into liquid or ice and clouds are formed. On a warm and humid day, large cumulonimbus clouds (also known as Thunderheads) can form that make thunderstorms.
6. When you have warm and humid air the conditions are favorable for thunderstorms to form. Thunderstorms form in tall cumulonimbus or Thunderhead clouds. They contain lightning and the sound caused by lightning, thunder. Sometimes hail can form.

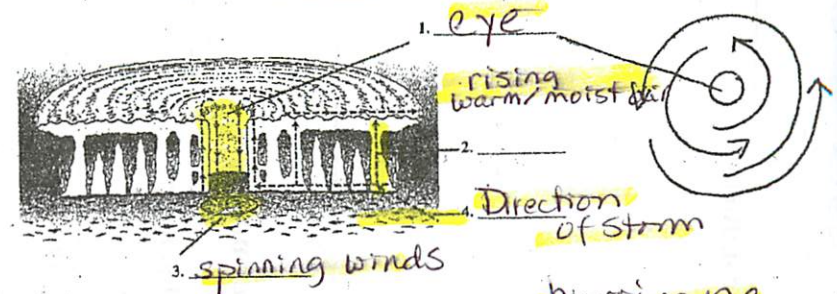
Tornadoes can form in Thunderstorms.

7. In a cold front, cooler air sinks below warm air and helps push the warm air up. Tornadoes often form at the leading edge of a cold front.
8. Tornado alley is the area in the plains (Texas, Arkansas, Kansas) where you have warm moist air (maritime tropical) and cold dry (continental polar) and hot dry (continental tropical) that can collide and produce thunderstorms with the right conditions for tornadoes. We currently believe winds will start spinning horizontally and get pushed vertically in a thunderstorm. If the conditions are just right a tornado may form. Tornadoes can form anywhere if the conditions are right.

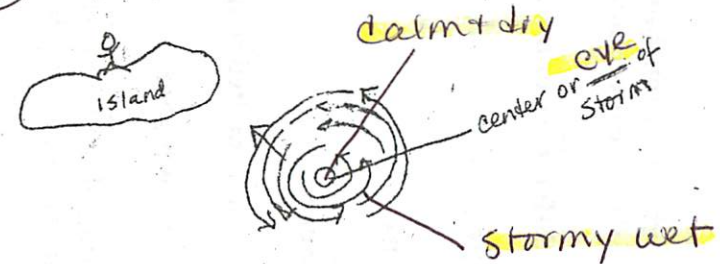
Hurricanes are groups of thunderstorms that form over warm ocean water.

9. Hurricanes are formed over the ocean. They start out as a low pressure system also known as a tropical depression. They are a huge group of thunderstorms that start to spin. As they travel across warm water, they add more humidity from the ocean and grow in size and wind speed. As with any severe thunderstorm, they can have tornadoes form in them. When hurricanes reach the land, they bring very heavy winds, huge waves (storm surge), huge amounts of rain and sometimes tornadoes. Once a hurricane reaches land or colder water, they dump all of their rain and die out.

Word Bank for picture below: Direction of storm, eye, spinning winds, rising warm/moist air



15. What type of storm does the picture above represent? hurricane
16. What do you call the center area of this storm? eye
17. What type of weather would you have as the center of this storm passes over you? A. (calm and dry) B. (stormy and wet)



18. In the northern Hemisphere, the air movement direction in this storm is spinning counterclockwise
 - A. Moving straight
 - B. spinning counterclockwise
 - C. spinning clockwise
19. Place in order of wind speed from least to greatest
 - a. tropical storm, hurricane, tropical depression
 - b. Tropical depression, tropical storm, hurricane
 - c. Hurricane, tropical depression, tropical storms
20. What speed does the wind have to blow to be considered a hurricane? 119 km/h or 74 mph
21. In some years there are more hurricanes than usual. This is probably because
 - A. the ocean is warmer than usual.
 - B. the ozone layer is very thin.
 - C. there are more windy days than usual.
 - D. the gravitational pull of the Moon is stronger

Big 20 (Weather)

Revised

30



1. Heat travels through space as radiation. Heat travels by touching through conduction. Heat travels through a fluid (air, water, and mantle) by convection.
2. Unequal heating of the Earth's surface causes differences in heat.
3. Differences in heat cause molecules to have differences in pressure and density.
4. Warmer air is less dense and has less pressure.
5. Cooler air is more dense and has more pressure.
6. Heat rises and cool sinks in all situations (air, water, melted magma)
7. Differences in pressure cause wind. Air moves from higher to lower air pressure.
8. Local winds are caused by differences in heating of land and water. Land heats up faster and cools down faster. Water heats up slower and cools down slower.
9. Sea breezes come from the sea (during the day). Land breezes come from the land (at night)
10. Global winds are caused by differences in heating due to latitude. *Equator and poles. Trade winds, prevailing westerlies, and polar easterlies are global winds. Doldrums and Horse latitudes are areas of calm where air sinks. or rises
11. Air masses are huge masses of air with similar pressure, temperature and humidity.
12. Air masses get their temperature and humidity when they form above land (dry) or Water (moist or humid)
13. Weather occurs in the Troposphere layer of the atmosphere.
14. The boundary of an air mass is called a front. When fronts meet they cause heat to rise. Unstable air and humidity bring rain, snow, or thunderstorms.
15. Thunderstorms are more likely to form when it is warm or hot and humid.
16. Funnel clouds that touch the ground are tornadoes. Tornadoes can form in severe Thunderstorms at the leading edge of a cold front.
17. Wind causes waves on the ocean and lakes.
18. Hurricanes are spiraling bands of thunderstorms that form over warm ocean water. Low pressure- Tropical depression- Tropical storm- Hurricane (74 MPH or 116 km/h)
19. Tropical storms and hurricanes lose strength over colder water or land.
20. A storm surge is a dome of water that comes in with the hurricane. The eye of the hurricane has calm winds and light rains. The eyewall is the strongest part of the storm.