

1.

What is a thunderstorm?

A thunderstorm is a storm that produces lightning and thunder. It also can frequently produce gusty winds, heavy rain, and/or hail.

4.

What kind of clouds are associated with thunderstorms?

Associated with tall dark cumulonimbus clouds.

16.

When is tornado season and why?

Tornado season is generally from April to June in the United States. This is when the temperature contrast between air masses is strongest. During this time, warm, moist air from the Gulf of Mexico meets cold, dry air from Canada, while the jet stream is still strong and positioned farther south, creating strong wind shear. These conditions favor the development of severe thunderstorms and mesocyclones, which can produce tornadoes.

7.

What is an updraft and downdraft and what causes both?

Updraft and downdraft, in meteorology, upward-moving and downward-moving air currents, respectively, that are due to several causes. Local daytime heating of the ground causes surface air to become much warmer than the air above, and, because warmer air is less dense, it rises and is replaced by descending cooler air

13.

What is a squall line and how does this form?

Squall lines generally form along or ahead of cold fronts and drylines and can produce severe weather in the form of heavy rainfall, strong winds, large hail, and frequent lightning.

10.

How does hail form?

When ice particles move up and down in a cloud due to strong updrafts and downdrafts, the particles grow in size forming hail.

2.

What are some differences between air-mass thunderstorms and severe thunderstorms?

In air mass thunderstorms the downdraft and precipitation fall into the updraft which progressively weakens it. In a severe thunderstorm, the updraft and downdraft are separated allowing the storm to last longer.

17.

Where is tornado alley and why?

Tornado Alley is a nickname given to an area in the southern plains of the central United States that consistently experiences a high frequency of tornadoes each year. Tornadoes in this region typically happen in late spring and occasionally the early fall.

14.

What is a tornado and how does it form (i.e. what ingredients / conditions lead to tornado formation?

It takes a thunderstorm to produce a tornado but a relatively small number of thunderstorms have all the ingredients to make a tornado. There are four main factors that must be present for a thunderstorm to produce a tornado and these are shear, lift, instability and moisture.

11.

What is lightning and thunder and what causes both of these to occur in a thunderstorm?

Lightning is lighter, positively charged particles form at the top of the cloud. Heavier, negatively charged particles sink to the bottom of the cloud. When the positive and negative charges grow large enough, a giant spark - lightning - occurs between the two charges within the cloud. Thunder is caused by lightning. When a lightning bolt travels from the cloud to the ground it actually opens up a little hole in the air, called a channel. Once then light is gone the air collapses back in and creates a sound wave that we hear as thunder..

8.

What is entrainment and what causes it to occur? What effects can it have on cloud development?



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8. (cont)

During entrainment, drier air incorporates itself into the cloud and induces evaporation. When air sinks, it warms adiabatically. This can occur when dynamic sinking mechanisms instigate or increase over a cloud or cloud field.

5.

Where in the US are thunderstorms most common and why do they form there?

Florida receives so many thunderstorms because of convergence of air over the peninsula due to sea breezes on both the east and west coast under common conditions.

9.

What is a gust front and what is the significance of it?

Cool downdrafts spread laterally and produce a gust front - outflow boundary of cool air from a downdraft; similar to a cold front. Gust fronts can cause warm air to be pushed up ahead of the storm producing another thunderstorm cell

12.

What conditions are needed to form a thunderstorm?

Three basic ingredients are required for a thunderstorm to form: moisture, rising unstable air (air that keeps rising when given a nudge), and a lifting mechanism to provide the "nudge." The sun heats the surface of the earth, which warms the air above it.

6.

What are the stages of development of a thunderstorm?

Stages:

Cumulus - Localized convective heating create strong updrafts - upward moving air - which carries moist air up in the atmosphere. Release of latent heat due to condensation warms the air and allows each new surge of warm moist air to rise higher and higher.

Mature Stage - Rising air reaches stratosphere and flattens out like an anvil. Bottom of clouds appear very dark due to being very thick (light gets blocked). Once updrafts cannot support rain within cloud, precipitation falls. Downward movement of precipitation drags on the air pulling it down causing a downdraft

Entrainment - The movement of cool dry air from outside a thunderstorm cloud into the cloud. Caused either from mixing or due to the drag of rain falling thru the atmosphere Last, Dissipation

15.

How do we classify tornadoes? What is the name of the scale used to classify them?

This system is called the F-Scale or Fujita Scale; it classifies tornadoes by their estimated wind speed, which is determined by looking at how strong the wind must have been to cause the resulting damage. Tornadoes are classified into five categories, F-0 through F-5.

3.

What specifically is needed to categorize a thunderstorm as severe?

A thunderstorm is classified as "severe" when it contains one or more of the following: hail one inch or greater, winds gusting in excess of 50 knots (57.5 mph), or a tornado. Cool downdrafts spread laterally and produce a gust front - outflow boundary of cool air from a downdraft; similar to a cold front. Gust fronts can cause warm air to be pushed up ahead of the storm producing another thunderstorm cell. As downdrafts pull air down in a cloud, cool dry air from outside the cloud is brought into the cloud - entrainment.

