

The background features a vibrant blue sky with a large, bright yellow sun in the upper right corner. Several light blue, stylized clouds are scattered across the top. The overall aesthetic is clean and modern, with a focus on geometric shapes and a cool color palette.

NOVA Cloud Lab Video Questions



Important factors for the development of Hurricane Sandy

- Warmer water in Gulf stream (ocean current that runs up the eastern US coast)
- Blocking high pressure system over Greenland
- Cold front approaching from west brought more stormy weather
- Abnormal jet stream (air current, normally pushes weather west to east over US, pushed Sandy back over land)



1. How does the Sun's uneven heating of Earth drive the creation of clouds?

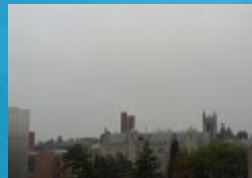
- Air rises from Earth's surface to higher and colder reaches of atmosphere
- Occurs when cold, dense air mass pushes a warmer air mass upward OR when a patch of ground absorbs more heat than its surroundings, transferring that heat to the air above, causing it to rise
- When the warm air cools, the water vapor condenses around condensation nuclei (particles of dust, smoke, organisms), forming clouds

Cloud characteristics



○ Cirrus-hair (the high, wispy clouds)

○ Cumulus-heap/pile (the puffy clouds)



○ Stratus-layer (low, dense, sky covering clouds)


○ Nimbus-rain (clouds that precipitate)





2. Severe Storms: What are the ingredients for a severe storm and where do they come from?

- 1. energy source: warm air or water (temperature differences between 2 air masses or from heat absorbed by Earth's surface that warms the air above it)
- 2. moisture: produces precipitation and carries energy from the surface into upper atmosphere; water vapor is produced when the Sun heats liquid on the surface, causing it to evaporate; when it condenses into a cloud, it releases heat energy
- 3. unstable air: air surrounding the storm must be significantly colder than air at lower levels; as storm clouds rise and release heat, they continue to be surrounded by colder air and rise higher;



3. How do clouds influence the exchange of energy between Earth, the Sun, and space? How might climate change affect this process?

- Clouds cover 70% of the planet, influencing global weather and climate
- Overall they reflect more energy than they absorb, having a cooling effect; a cloudless planet would be 22 degrees Fahrenheit warmer
- Stratus clouds reflect more energy than they absorb (cooling); Cirrus clouds absorb more than they reflect (warming)
- If climate change leads to more cirrus clouds, over the next few centuries, polar regions could heat up by as much as 25 degrees and ocean levels could rise up to 6 feet



4. Why do storms spin in different directions in the northern and southern hemispheres?

- In the northern hemisphere, big storms spin counterclockwise and in the southern hemisphere, big storms spin clockwise due to the Coriolis Effect
- The Coriolis Effect causes fluids to curve over Earth's surface
- Earth spins west to east, with the equator spinning faster than the poles; in the northern hemisphere, this causes winds to be tugged to the right