

# Earth science

[Countries](#), [United States](#)



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Question One The Great hurricane of 1938 hit New England and Long Island in 1938 on 21st of September. It began as a tropical depression in Africa's west coast, at the south of the Islands of Cape Verde. The United States weather forecasters were the first to notice it, in the north of Puerto Rico on September 18 and as a strong hurricane of category 5, on September 19.

A ship reported a hurricane at 8. 30 a. m. on September 21, near Cape Hatteras.

At 3. 30 p. m., it hit Long Island and crossed into Rhode Island and Connecticut. The hurricane killed around 700 people, 100 in Long Island and 600 in New England.

Hundreds of houses were destroyed, boats carried into the sea, cars wrecked and wreckages washed in or out of sea in Long Island. In Connecticut, fire resulted from power lines, which had fallen, and spread into Mystic and New London. The storm was a surprise to those who lived and worked on Long Island and Rhode Island, because at that time there was no technology that could indicate a storm, while at the sea. Communication infrastructure was also poor, so that people could see what was happening.

It was also a surprise to the people because it was believed that a storm of such extent could not take place in that side of the region. Frederic Foster, who worked in New York City, died from exhaustion when he reached home, in Long Island from work. It normally took him 15 minutes to reach home from work in his car, but on this day, it took him 2 hours. This was due to the weather and the obstacles on the road caused by the weather. The Burghard

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household in Westhampton also narrated what they went through in order to survive the storm.

They continuously sought a higher ground, endured objects that flew around them, the great winds and the ocean. Question Two Thunderstorms from air mass usually develop in the afternoon hours. This is when the heating of the surface forms convection currents at a great number, in the atmosphere.

The process takes place in three stages.

In the first stage, cumulus clouds are formed by the rising and cooling of humid air. These clouds are formed as a result of latent heat, which is released from the deposition and condensation. This heat maintains air warmer in the side of the cloud as compared to the surrounding air. The cloud increases in its growth as humid air adds to it. The updrafts change to downdrafts after reaching a maximum altitude, in the growing cloud and shifting their direction, at 180 degrees. At this moment, it reaches the mature stage. Precipitation starts to form by coalescence and collision, in the downdrafts.

At this stage, the storm is a cumulonimbus cloud and is intense. The cloud forms an anvil shape and ice crystals are spread horizontally in the top, by the upper-level winds. Severe thunderstorms are formed when the conditions worsen and the mature stage prolongs. These thunderstorms are usually characterized by frequent lightning and 97 km/h wind gusts or two centimeters wide hail and even tornadoes.

In most of them, the storm's movement can refresh the warm humid air supply, in an easterly direction. The storm sustains itself through the balance of the downdrafts and updrafts of the storm, when the energy of latent heat is continuously supplied. Its movement is brought about by a cold front of a mid-latitude cyclone or by a dry line that is ahead of the cold front by 100 to 300 kilometers. Mid-latitude cyclones change thunderstorms of air mass into severe thunderstorms that extend top many hours. Tornadoes develop in early evening hours and late afternoons, mostly from 4 pm to 9 pm. However, they can also occur at any time, during the night or day. Question Three Mars is the fourth planet in the solar system, from the sun.

Its name comes from the Roman god of war, Mars. This is due to the planet's red color that is caused by the iron (II) oxide, commonly known as rust or hematite, on its surface. The diameter of the planet is approximately half the diameter of earth. Its volume is around 15 percent of Earth's volume and it's mass around 11 percent that of Earth's mass, giving it a lower density than Earth. The period of rotation and cycles of the seasons of Mars are the same as those of the earth; this includes the tilt that causes the seasons. It has both the deepest long valley and the highest mountain in the solar system.

It also contains the largest volcanoes found in the solar system. This includes Olympus Mons that has a diameter of around 600 kilometers. The Olympus Mons is volcano that has slopes, which rise like the slopes of the volcanoes of Hawaii. It was made through lava eruptions that flowed for long distances and then solidified.

The Borealis basin takes up 40 percent of the planet and forms a large impact feature. The planet also has other volcanic landforms. There are two moons in Mars. They are known as the Deimos and Phobos.

They are small and have an irregular shape. The moons could be asteroids that have been captured. Three orbiting spacecrafts have been put on Mars; these are Mars Express, Mars Odyssey and Mars Reconnaissance. There is also a spacecraft on the surface known as Mars Exploration Rover Opportunity. Observations by these spacecrafts show that ice caps in the south pole of the planet have been receding. They also show the presence of water during Mars' warmest months. Mars has an apparent magnitude of 3.

0. In the formation of the solar system, Mars was made from a stochastic process, from accretion of runway, out of the disk of protoplanet, which orbited the sun. Question Four The two properties of light are reflection and refraction. In reflection, the incidence angle is equal to the reflection angle. Refraction occurs when light bends as it passes through materials that are of different densities. Diffraction on the other hand is the bending of light slightly when passing an object's edge and the spreading out of the waves of light, when it goes small openings. Light shows the existence of such elements as lithium, deuterium, lithium and hydrogen. Through the comparison of light from a variety of chemicals with light from the sun, it has been proved that the sun comprises mostly of hydrogen.

Through this comparison, the nature of different atoms from galaxies has been made out. Explosions of hydrogen cause the formation of light from the galaxies. Light can be used to measure the age of the universe. The distance

traveled by light in a year is known a light year. Light travels at a speed of  $3 \times 10^8$  meters per second. The age of the universe is around 15 billion light years.

Light can also be used to measure the size of the universe. The radius of the universe is measured to be around 10 billion light years. By examining the changes of light wavelengths from galaxies and stars, the expansion of the state can be detected through the red shift. Stars give off waves of light that are of different lengths, based on elements that are being fused. Each star has spectral lines. This is a spectral pattern formed by different light wavelengths. The difference in the wavelengths of light is due to the fusion of the different elements. The length of the wavelength of light is correspondent to the distance of a galaxy or star from the earth.

Hence, when the star moves away from the earth, the wavelength becomes longer. An approaching light is blue-shifted and when it moves away, it becomes red-shifted. The shifts show the expansion of the universe and the galaxies' movement way from the earth.