

Earth space science chapter challenge



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Introduction To build an arena here in [CITY], you will have to know some of the severe weather hazards that we go through and how we can overcome it. It is important to know what kind of weather [CITY] goes through to ensure people's safety and know what to expect during certain time of the year. [CITY] encounters five severe weather hazards: thunderstorms, flash floods, lightning, tornadoes and hurricanes. Thunderstorms are a short lived weather system that produces rain, lightning, and rarely tornadoes. Flash floods are a sudden rise in water levels of a stream, river, or manmade drainage system. Lightning is an electrical discharge, and thunder is the shock wave lightning leaves behind. Hurricanes are cyclones that develop over warm tropical oceans. Tornadoes are cylindrical shaped cloud masses with very strong winds and powerful updrafts. All these weather systems are capable of causing severe damage to the community depending on how strong they are. Preparations in advance and safety procedure for each hazard are listed down below to help you get ready once the arena is made.

Thunderstorm A thunder-storm is a relatively small short-lived weather system that normally lasts for twenty minutes to several hours.

Thunderstorms go through three cycles: cumulus, mature and dissipating. In the cumulus stage, cumulus clouds are formed through many different types of uplift. Most clouds here in Florida are formed through convective uplift and convergence because of its location. After the cumulus stage, it goes through the mature stage, where cumulus clouds turn into cumulonimbus clouds and starts precipitating. This is the stage when precipitations are the heaviest. The dissipating stage follows after which is when precipitation tapers off and clouds dissipate. Even though most thunderstorms aren't that severe, there are exceptionally strong ones that occur once in a while that

may provide to be a threat to the community. Multicellular thunderstorms such as squall lines and meso scale convective complexes may last for several hours with intense downdraft. The intense downdraft causes wind shear which changes the direction of a plane and may produce heavy precipitation. One of the most intense thunderstorms are super cells. They have very strong updrafts and are responsible for one of the most powerful tornadoes and the heaviest precipitations which also lead to flash flooding. Tornadoes, lightning, flash floods and hurricanes are all caused by thunderstorms. Thunderstorms occur most during spring and summer when the air mass is the warmest. Weather radars are able to detect thunderstorms because it reflects microwaves that are being sent. Because of this, we can tell when a thunderstorm might come beforehand giving us enough time to prepare for it. The clouds would be dark grey indicating that a thunderstorm might come soon so that's another way to indicate that a storm is coming. Staying in a nearby local shelter would be best when a thunderstorm hits. Staying away from high places and avoiding contact with metallic objects are recommended for there are lightning as well. When there is a power outbreak, having a flashlight, a radio and canned food are recommended. Flash Flooding Flash flood is a sudden rise of water level of a stream, river or a man-made drainage channel caused by heavy rainfall. Flash flood occurs when the ground becomes saturated with water falling too quickly for it to be absorbed. Flash floods are more vulnerable in urban areas with low elevation because concrete and asphalt cannot absorb water. It occurs when thunderstorm occurs; during spring and summer. During a flash flood, it may cause the water from the sewer or river to overflow flooding the city street. Flash floods are more serious in mountainous terrain where river

valleys are narrow and deep. They also strike any time and any place with little or no warning. Watch out for heavy rains from thunderstorms and rising water level. It could turn a quiet streamside campsite into a rampaging torrent and city streets into rivers. Staying at a high ground and having a radio with you are recommended to keep in track with the status. Lightning No matter how weak a thunderstorm is, lightning is always made. Scientists believe that there is a positive and a negative charge inside a cumulonimbus which produces an electrical discharge. Lightning forges a path between the cloud and the ground which causes lightning to strike the Earth's surface. Despite all that, out of all the lightning flashes we see, only twenty percent actually strikes the Earth's surface. Lightning is most dangerous when it strikes something that readily conducts electricity. Also, lightning tends to follow the shortest path between the cloud and the ground so tall objects such as trees and buildings usually get struck. It could cause forest fires by striking in places that hasn't precipitated yet. Lightning occurs during all the stages of thunderstorms so whenever a thunderstorm arrives, be aware of lightning. Avoiding high elevated places and metallic objects would reduce the chance of being struck by lightning and if you are dealing with someone who has been struck by lightning, do not touch him unless you know he carries an electrical charge and it is safe to touch the person. Tornado

Tornadoes are considered one of the most dangerous natural disasters that occur during a thunderstorm. Tornadoes are rotating columns of air that connects from the cloud to the ground. Even though they only last for short periods of time, they can be deadly. Tornadoes have wind speeds up to 300mph but only last for few hours. The strongest tornado could rip off buildings, destroy houses, and even deform large skyscrapers. The

tornadoes are scaled by the Fujita Scale, which scales tornado based on how much damage it does on the structures and vegetations. Tornadoes are formed through super cell thunderstorms where winds start swirling in a shape of a funnel. Tornadoes also form when the temperature of two air masses tends to be the greatest which is during spring and summer. All tornadoes start from a severe thunderstorm and there might be a tornado watch during the thunderstorm. Because tornadoes are formed suddenly, warnings come only about 5 to 10 minutes before a tornado actually hits. Staying in a room with little space and no windows or a local shelter are both recommended. Also, hiding underneath a bridge or a ditch would also be a somewhat safe place if there is no shelter in your vicinity. If possible, get a portable, battery-powered radio to keep an update on how the status of the weather is. Hurricanes are the biggest and the most dangerous hazards out of the five hazards. They are cyclones that develops over the warm tropical oceans and have sustained wind speed over 74mph. These storms are capable of producing dangerous winds, torrential rain and flooding which could damage tremendous property and loss of life in coastal populations. They live for long periods of time and are scaled by the Saffri Simpson Scale. These occur from midsummer to late fall. Warm humid air mass over the oceans and groups of thunderstorms helps form a tropical storm. It later becomes a hurricane when the surface pressure continues to drop as the wind speed increases. Hurricane could be traced through the satellite so we would know immediately when the hurricane is going to hit through the weather channel. Because hurricanes last for long period of time, some of the tools needed are week supplies of canned food and water, flashlight, first aid kit, and a radio to stay updated with the weather. Some

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recommended actions are to avoid rooms with windows, take road map for local shelters, and planning ahead on what you're going to do. Conclusion The five weather hazards that occur in [CITY] may be potentially dangerous; it could be taken care of with ease if you follow the safety procedure and plan ahead of time. Using the arena as a shelter in case of hurricanes, tornadoes and thunderstorms are great to use but may be vulnerable to flash flooding due to its location. Installing lightning rods will be a great asset to protect from lightning damaging or causing harm to people. I suggest finding another area to build an arena because if the arena was to be built near St. Johns River, the chance of the river flooding the arena is high. As you get used to the weather hazards we have here in [CITY], make improvements on how the arena should be built to withstand these weather hazards.