CME Peer-Reviewed article teacher guide

The Explore phase of the lesson includes a rather dense article about coronal mass ejections. Up to this point, students will have little to no experience with CMEs and may have a hard time wading through the article, but that is ok. If students remain confused after the C.U.S and Discuss share out, the Explain video does a good job describing the main ideas of the article.

# Leading the class discussion of CUS and Discuss

## During the course of the discussion, be sure to touch on these points, listed in order of importance:

## CMEs are expulsions from the sun’s corona of plasma and magnetic field. The result is a barrage of charged particles hurling through space. If they hit earth, they have the potential to cause problems. There are weak CMEs all the time, and strong ones occasionally.

## The CMEs analyzed in this lesson travelled through earth’s orbital path around the sun, but the earth was not there at the time the CME occurred. In cosmic terms, it was a very close shave and nearly changed life as we know it.

## Analysis revealed that, while a singular strong CME can be detrimental to earth, when there are successive CMEs, the later ones have the potential to be catastrophic because the first CME basically cleared the way for the next CME.

## The event that was analyzed happened in July 2012.

## The research question that drives this project is found at the end of the first paragraph: “How does an extreme space weather storm form and evolve, and how severe can it be when it reaches earth?”

## Scientists analyzed data from satellites collecting data near the sun.

## *In situ* means collecting data from within the source. As opposed to remote sensing, which means collecting data from afar, like satellites orbiting earth collecting surface observations.

## One AU, or astronomical unit, is approximately 93 million miles, the distance between the sun and earth. Scientists use AU to measure distances in our solar system.