# IMAGINETICspace: MMS Transmedia Book

### Concepts:

* A magnetometer monitors changes in the Earth's magnetic field for signs of magnetic storms - bad space weather.
* Forces can act over a distance. Small magnets create a large force that can be transmitted over a distance.
* Matter can become charged when different types of material are rubbed against each other.
* Current understandings of electric charge indicate that there are two types of charges, positive charge (+) and negative charge (-).
* Typically, these charges exist in equal numbers so that they balance out. Thus, normal matter is uncharged. Such contact between different materials transfers some electrical charge from one object to the other. In the experiment, the static electricity allows the two pieces of plastic tape to affect one another without touching.
* An octagonal prism is the most efficient shape for the solar panel arrays for the MMS because of the solar panels.
* The centrifugal force of the rotating satellite is sufficient to push the booms out of the body of the satellite.

### Standards:

The National Research Council’s National Science Education Standards (NSES) and the AAAS Project 2061 benchmarks that are addressed by the MMS E/PO plan include the following:

* The sun is the major source of external energy for the Earth (NSES, p.189)
* The Earth is one of several planets that orbit the sun (2061, 4A/4)
* Heating of Earth’s surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents (NSES, p.189)
* Global climate is determined by energy transfer from the sun at and near the Earth’s surface. This energy transfer is influences by dynamic processes such as cloud cover and the Earth’s rotation, and static conditions such as the positions of mountains and oceans (NSES, p.198)
* To understand the role of the sun it is necessary to comprehend large distances, long time scales, and the nature of nuclear reactions. (NSES, p.188)
* Driven by sunlight and earth’s internal heat, a variety of cycles connect and continually circulate energy and material through the components of the Earth system. Together these cycles establish the structure of the Earth system and regulate Earth’s climate (NSES, p.187).
* The sun, the Earth, and the rest of the solar system formed from a nebular cloud of dust and gas 4.6 billion years ago. (NSES, p.189)
* Almost all food energy comes originally from sunlight (2061, 5E/3)
* Movement of matter between reservoirs is driven by the Earth’s internal and external [sun] sources of energy. (NSES, p.189)
* The sun is the major sources of energy for phenomena on the Earth’s surface, such as growth of plants, winds, ocean currents and the water cycle. (NSES, p. 161)