Rendezvous with a Comet Lessons and Activities 8th Grade Standards		
Timing	Mission and Description	Supported Standards
Pre-Mission	**Mission Patch**: All on-site missions ask students to collaboratively create a mission patch symbolizing the class, school, and mission. Teachers are encouraged to emphasize "consensus" with the students to instill the concept of give-and-take when making group decisions.	Science:-- Math:-- English:1.1, 1.2 Social Studies:-- Visual Arts:2.1, 3.1, 3.2, 3.3, 4.1, 4.2
	Investigating a Comet: An initial brainstorming activity where students are asked to explain what they know about comets, before studying the unit. Then they are asked to discuss why studying comets is important to us here on Earth. They also compare what they know about comets to planets or asteroids and are asked to draw comparisons and contrasts between them.	Science:3.3, 3.4 Math:-- English:1.2, 2.2 Social Studies:--
	Famous Comets: A multimedia, team-activity where students are asked to research famous comets on the Internet. Students are then asked to create their own "comet" by using similar information to describe the history and scientific details of their comet.	Science:3.3 Math:-- English:1.2, 2.2, 2.3, 4.3 Social Studies:--
	Cometary Orbits: Using Kepler's Laws, students will calculate the eccentricity of a comet by doing a hands-on activity. By discovering the foci and axes of ovals, students can use a formula to determine eccentricity.	Science:1.1, 3.3 Math: 1.1, 2.1, 2.3, 4.3 English:-- Social Studies:--
	Investigating Falling Particles: This engineering lesson shows students the difficulties in working with materials that have never been worked with before. So how difficult was it for scientists to design a collection system for cometary particles when they have never collected them before?	Science:3.3 Math:-- English:2.2, 4.3 Social Studies:--
	Particle Collection: Now that the students have learned how capturing things, intact, can be very difficult. Next they have to design a way to collect a clay ball, without it losing shape, size, or mass.	Science:-- Math:-- English:4.3 Social Studies:--
	Aerogel: Students will learn about the substance aerogel, created to collect cometary particles. To get a better idea about how aerogel works, teachers will make a gelatin-equivalent to show how the substance works.	Science:-- Math:-- English:2.2, 4.3 Social Studies:--
	Cookin' up a Comet: Comets tend to have the nickname, "dirty snowballs," because of their composition. In this activity, the class will make a comet by using dry ice, dirt, rocks, etc. to explain "sublimation."	Science:-- Math:-- English: 1.2, 2.2, 4.3 Social Studies:--
Mission Day	**Tracking the Orbit of the International Space Station**: An important part of this mission is tracking the location of the ISS. Using an industry-standard orbit visualization software package, Satellite Toolkit ® (STK), students can track the ISS in three-dimensions.	Science:1.1 Math:2.1, 2.3 English:1.2, 2.2, 4.3 Social Studies:--
	Testing Meteoroids: Students will be working with geological materials to determine mass, volume, and magnetism of certain materials. This utilizes hands-on learning by working in glove boxes, using water displacement, and working with scales to develop logical conclusions.	Science:-- Math:-- English:1.2, 2.2, 4.3 Social Studies:--
	Maintaining a Habitable Environment: To provide a safe, artificial environment for our astronauts, students will need to maintain the air pressure, humidity, water quality, and oxygen levels on board the International Space Station.	Science:-- Math:2.1 English:1.2, 2.2, 4.3 Social Studies:2.2
	Assembling a Probe: Students have to communicate concisely with one another in order to build a probe to launch at the comet. This activity requires problem solving, analysis, and the idea of completing a circuit.	Science:-- Math:-- English:1.2, 2.2, 4.3 Social Studies:--
	Examining Human Physiology: Astronauts have to be concerned with the effects of microgravity on the human body. During a mission, students will have their vestibular systems tested in a Barany Chair and will use these results to conclude if the "crew" is adapting well to life in microgravity.	Science:-- Math:-- English:1.2, 2.2, 4.3 Social Studies:2.2
Post-Mission	**Press Conference**: Students are asked to prepare for a press conference to answer questions surrounding their mission. Then parents, teachers, and administrators ask students to reflect on their experience and explain what they learned as a result of their mission.	Science:-- Math:-- English:1.2, 2.2, 3.3 Social Studies:--