Scope and Sequence

Space Exploration
Robotics

Subject: Mathematics Grade: __6__ Designer:_Allison Hamby____

Week 1

6.8 A-D **Measurement.** The student solves application problems involving estimation and measurement of length, area, time, temperature, volume, weight, and angles.

6.11 **Underlying Process and Mathematical Tools** (A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;

6.11 **Underlying Process and Mathematical Tools** (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;

Moon Math http://dln.nasa.gov/dln/content/catalog/details/?cid=521

Creating a Nano Rover http://spaceplace.nasa.gov/en/kids/muses_nanorover.pdf

Extension Question:
Why are mobility and robotic important to space exploration?
How can your rover benefit planet earth if we were to send it to space?

Week 2
6.1 **Number, operation, and quantitative reasoning.** (C) use integers to represent real-life situations

6.7 **Geometry and spatial reasoning.** The student uses coordinate geometry to identify location in two dimensions.

Hurricane Dolly Picture Analysis (pictures from NASA's Aqua Satellite)
http://www.nasa.gov/mission_pages/hurricanes/archives/2008/h2008_dolly.html
http://www.nasa.gov/images/content/260737main_dolly_AIRS_HI.jpg
http://www.nasa.gov/images/content/260913main_dolly_gulf_HI.jpg

Extension Question:
How could a coordinate plane be used in the creation of a robot?

Week 3
6.3 **Patterns, relationships, and algebraic thinking.** The student solves problems involving direct proportional relationships.

6.11 **Underlying Processes and Mathematical Tools** (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness

6.11 **Underlying Processes and Mathematical Tools** ((C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem

Honey, I Shrunk the Data!
http://spaceplace.jpl.nasa.gov/en/kids/eo3_compression.shtml

Rocket Science
http://dln.nasa.gov/dln/content/catalog/details/?cid=293

Extension Question:
Why is robotics important to collecting data and conducting science experiments in space?

Week 4

6.3 **Patterns, relationships, and algebraic thinking.** The student solves problems involving direct proportional relationships.

6.11 **Underlying Processes and Mathematical Tools** (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness

6.11 **Underlying Processes and Mathematical Tools** ((C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem

Importance of Mathematics in Space Exploration: Calculating a Rendezvous
http://www.nasa.gov/mov/246943main_179_Solution_to_Mir.mov

Extension Question:
How could proportions and ratios be used in the exploration of the planet Mars? Be sure to address the importance of robotics and rovers in space exploration.

Week5

6.3 **Patterns, relationships, and algebraic thinking.** The student solves problems involving direct proportional relationships.

6.8 A-D **Measurement.** The student solves application problems involving estimation and measurement of length, area, time, temperature, volume, weight, and angles.

6.11 **Underlying Processes and Mathematical Tools** (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness

6.11 **Underlying Processes and Mathematical Tools** ((C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem

Line up with Math: Proportions and Distance Rate
http://dln.nasa.gov/dln/content/catalog/details/?cid=600

Extension Question:
How is mathematics used in the creation of robotic equipment and/or during space exploration?

Week6

6.5 **Patterns, relationships, and algebraic thinking.** The student uses letters to represent an unknown in an equation. The student is expected to formulate equations from problem situations described by linear relationships.

6.11 **Underlying Processes and Mathematical Tools** (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness

Calculating Velocity in Space
http://www.nasa.gov/rm/176067main_04_Mathematics.rm

Extension Question:
Why is velocity important to space travel and the transportation of robotic equipment to space?