Lesson 1 – Student Worksheet

Moon, Mars, and Beyond

Scenario

The year is 2080 and exploration outposts have been formed on the Moon, Mars, and each of the four gaseous planets: Jupiter, Saturn, Uranus, Neptune, and Pluto. Colonies of hardy pioneers are living on settlements in an effort to study the resources and environments on each planet.

Your mission begins with the launch of a spaceship traveling on a routine voyage from the Moon to a Martian base. Students are in Mars Mission Control and are in constant communication with the Flight Director at Earth Mission Control.

Then, something happens! Earth Mission Control receives an urgent message from the spaceship traveling to Mars. One of the spaceships further out in the solar system must be experiencing problems with their communications equipment. They have not been heard from in four days! They appear to be lost and may need to be rescued!

- Where is the lost ship?
- What payload will you need to rescue the astronauts?
- How will you communicate with the ship and the other outposts?

Teams

You will join one of six teams:

- **Communication**
- **Uranus**
- **Jupiter**
- **Neptune**
- **Saturn**
- **Pluto**

Each team has Mission Specialists that do different jobs to find and save the lost ship:

- **Transmissions Specialists** – These specialists receive information from near their planet about where the lost ship has been each day. The information is encoded (written in code) and students must decode the message to get the information, record it on the Problem-Solving Chart, and pass it along to Mission Control. For this code:

- Greek symbols = Words
- Circular symbols = Individual letters
- Math equations = Words

- **Navigation Specialists** – Students plot the location of each planet on an x-y coordinate graph. They also plot the location of "unknowns" in the outer system and plot the course of the ship to determine where the ship could be now. The Navigation Specialists work with the Transmissions Specialists to identify the present location of the lost ship.
- **Cargo Specialists** – These students calculate the cargo needs for the rescue trip to and from their planet. They must calculate the cargo needs for the astronauts going on the rescue and for the additional astronauts they bring back. Cargo needs include food, water, oxygen, and the packing crates necessary to pack the cargo.

Vocabulary:

Cargo – the goods or freight carried in a ship, airplane, or vehicle

Code – a system of signals or symbols used for communication

Decode – to convert a code to a recognized message

Inner planets – the smaller rocky planets inside the asteroid belt; Mercury, Venus, Earth, and Mars

Mission – a specific job or task to perform; a flight operation of an aircraft or spacecraft, as in a space mission

Navigation – the job of getting ships, aircraft, or spacecraft from place to place; the method of determining position, courses, or distances traveled

Outer planets – the larger gaseous planets (and small, rocky Pluto) that are outside the asteroid belt; Jupiter, Saturn, Uranus, Neptune, and Pluto

Outpost – a frontier settlement

Payload – the load carried by an aircraft or spacecraft

Plot – to mark a location on a graph or map

Rescue – to save from danger

Resource – anything that can be used for something

Scenario – a story-line of a possible course of events or actions, especially when imagined

Simulation – a practice activity which duplicates the actual situation as closely as possible

Specialist – a person who is particularly knowledgeable about a certain job

Student Review Sheet

Answer the following questions about your Moon, Mars, and Beyond Mission.

You may look at your Mission Worksheet for the answers, but try to answer as many as you can without looking!

Questions:

1. In what year does the mission occur?

2. Where are you when the mission starts?

3. What is the main problem you will have to solve in this mission?

4. What teams will work together on this problem?

5. Each team will have specialists working on different jobs. State what each specialist will be doing:

6. Who will you be reporting to?

7. What job do you think you would like to do to help save the astronauts? (You will have to apply for the job!)

Good Luck! Our astronauts are counting on you!!