**Mars Farm**

**Lesson two**: Current Status of Mars Exploration

**Problem Statement:** Students must work together in teams to create a design a growing environment on Mars that will sustain three researchers for three years. In this lesson students are exposed to current status of Mars exploration and potential future plans of NASA. Students also reflect on their personal strengths and challenges brought to the group.

**Learning Objectives:** The student will engage in close reading activities to collect information regarding current exploration findings, future plans by NASA and other private companies.

The student will analyze his or her personal strengths and challenges pertinent to small group work.

**Lesson Standards** (NGSS, CCSS, CTE):

[CCSS.ELA-Literacy.RST.6-8.2](http://www.corestandards.org/ELA-Literacy/RST/6-8/2/)

Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

[CCSS.ELA-Literacy.RI.6.1](http://www.corestandards.org/ELA-Literacy/RI/6/1/)

Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

**Materials:**

* Junior Scholastic magazine (see works cited section)
* Science World (see works cited section)
* Newsela (see works cited section)
* Engineering Profile (included in student worksheet folder)
* Note: Some of the above materials are copywritten. Teachers involved in this unit used those materials as our classrooms subscribed to those magazines. Newsela is not copywritten and the Engineering Profile is freely available on the following site: [Engineering is Elementary](http://www.eie.org)

**Lesson Preparation:**

Copy (following copyright guidelines if they pertain to the articles) or use document camera.

Teacher determines which of the passages listed in the works cited section are most pertinent for the children’s needs (based on lesson one observations).

**Time Required:** 50 minutes for lesson.

**Grouping of students for instruction:**

As sixth grade teachers, we decided to predetermine our groups to balance for mathematical ability (lots of ratio/proportion work), engineering and design background, reading level, ELL vs. highly capable, social skills, leadership skills, organization, etc.). Optional: Teachers may choose to assign group member roles in a manner that works best for the children.

**Lesson Components:**

* Teacher rereads problem statement from previous lesson and reminds children of the overarching goal for this PBL. (1-2 minutes).
* Teacher leads close reading in passages below OR assigns passages based on student reading level in small groups. Using a jigsaw format, small groups of students become experts on their assigned passages and then return to their “home” group to share information with peers who did not read the same article. (25 minutes)
* Teacher invites students to share the pertinent information from their assigned passages and records information on chart paper to display in room. Capture 4-5 big ideas per passage. (10 minutes).
* As a class, students and teacher look for common themes or details between the passages that would be directly related to the general ideas in the problem statement. (5-10 minutes).

**Assessment:**

* Each student completes “engineering profile” for next lesson to reflect on his or her personal strengths and challenges. Remind children to think about the skills each brings to the group that would lead to success in the PBL task.

**Accommodations:**

* Engineering profile could be turned into a Google Doc for word processing if handwriting an issue.
* Teacher will be reading and rereading assignment.
* Classrooms have microphones for hearing impaired.
* Newsela, in particular, provides opportunities to raise or lower the Lexile level of reading passages.

**Extensions:**

* If students are interested, they could research how Mars colonization is depicted in various science fiction and/or how colonization is envisioned or depicted on Venus. As an example, students could watch the You Tube video [“All Summer in a Day”.](https://www.youtube.com/watch?v=cV-rzGx21rw)

**References/Resources:**

Jordan, Gary, ed. “Can Plants Grow with Mars Soil?” *NASA Johnson*. NASA, 7 Oct. 2015. Web. 17 Apr. 2016. <<http://www.nasa.gov/feature/can-plants-grow-with-mars-soil>>.

Klein, Andrew. “The Martian.” *Science World* 25 Oct. 2015: 20-22. Print.

Ross, Brooke. “Mission to Mars.” *Junior Scholastic Magazine* 29 Feb. 2016: 8-11. Print.

“Who will fly on mission to Mars? Crew members must have the right stuff.” *Newsela*. Newsela, 25 Feb. 2016. Web. 14 Mar. 2016. <https://newsela.com/>.