

Lesson 22: The Issues and Future of Space Exploration

Summary

This learning module and related exercises will expose students the issues of space exploration and the other NASA-partnering agencies and institutions as well as private companies engaged in space-related technology. Students address socio-scientific issues and apply the nature of science to real-world decisions regarding human space flight.

Learning Goals

Students will be able to:

- Become aware of NASA partnering agencies and private companies engaged in space-related technology
- Design a mission and experience the panel review/decision process.

Context for Use

This particular module does not apply to any Earth analog approaches, but rather exposes students to the philosophy and ethics of privatized vs. government-funded research programs. Students practice with the realities of a cutting a budget in preparation for the Mission to Mars project.

Description and Teaching Materials

In-Class Activity

In-Class Activity 1: Manned-Space Flight: Is it needed?

In-Class Activity 2: Space flight going private

Homework/Lab

Homework 1: Cut A Budget: An Ethical Debate

2. Become aware of the issues yourself before engaging in a discussion with students regarding privatization.

Assessment

Each *In-Class Activity* and *Homework* has its own measure of Assessment.

Teaching Notes and Tips

1. *Homework 1* should be given prior to the Mission to Mars project due date to give students experience.

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References and Resources

- Mission to Mars Rubric
- [Space X Press Release](#)



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In-Class Activity 2

Space Issues_MFE

Space Flight going Private

Purpose: Become aware of private companies pursuing space flight and their role with our outside of NASA's Mission directorate (government vs. private funding).

Preparation

Be ready to facilitate a discussion and have talking points outlined. Suggested questions are below.

Engage

Dragon docking with the ISS

Present students the following video of Space X's Dragon spacecraft docking with the ISS:

http://www.youtube.com/watch?v=QwDCWTqNceQ&feature=player_embedded

- a. Ask students what is significant about this event
- b. Ask students what they think of this venture

Explore

Lead a discussion of Privatization vs. Government-funded research in Space

1. What is the history of privatization?
2. What are the pros and cons of private companies taking over the space program?
3. Share the Space X video of their award to continue on manned-space flight
 - a. Video:

<http://www.youtube.com/watch?v=MZJk4CrxctQ&feature=youtu.be>
 - b. If the students had the money, would they buy a seat? Why or why not?
4. The Space X reusable Space Craft:

<http://www.youtube.com/watch?v=sSF81yjVbJE&feature=related>

 - a. Why is the Space X craft remarkable?

Explain

Compare NASA's budget with other federal government agencies and/or privately funded corporations using the following website:

<http://www.richardb.us/nasa.html#table1>

Elaborate

Space X's Mars Business Model

<http://www.youtube.com/watch?v=4fS1FxBq64A&feature=relmfu>

1. What do the students think of *Space X's* Mars Business Model?



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Evaluate

In a Group setting:

1. Decide as a group if privatization is a good route to pursue for space research and flight.
2. Groups should be ready to defend their position.

