Science and Innovation

A Boeing/Teaching Channel Partnership

MISSION TO MARS

Teacher Handbook

Teaching Channel

Mission to Mars

Day 10: Selling It to NASA

Grade Level	Middle School
Lesson Length	One 50-minute session

Lesson Overview

In this final lesson of the module, students prepare and give oral presentations (with one visual). During these presentations, students share their optimal solutions and evaluate solutions from other teams. Students understand how communicating with peers about proposed solutions is critical at all stages of the design process, and how shared ideas can lead to improved designs.

Connecting to the Next Generation Science Standards

On Day 10, students demonstrate understanding of the performance expectations and three dimensions developed throughout the entire module. These lessons serve as a performance assessment in which all of the performance expectations and dimensions are addressed in the final presentation. Reference the performance expectations, disciplinary core ideas, science and engineering practices, and crosscutting concepts referenced in the front matter of this module.

Basic Teacher Preparation

Students use all of the data they collected as well as their testing experiences to create their summative presentations. Make copies of the Presentation Rubric for each student or team and review it at some point in the lesson.

Required Preparation	Links/Additional Information
❑ Gather or purchase the required materials for the lesson	Refer to the Materials List below
❑ Ensure technology is available for students to show the identified product commercials, and if desired, for students to prepare their presentations	Refer to the Suggested Teacher Resources at the end of this lesson
❑ Conduct online search to identify one or two brief commercials for a product or a toy	
❑ Download and copy the Presentation Rubric for distribution	Mission to Mars Teacher Handbook, Appendix C

Materials List

Item	Description/Additional Information	Quantity	Where to Locate/Buy
Presentation Rubric		2 copies per team: 1 for the team, and 1 for the teacher to score	Mission to Mars Teacher Handbook, Appendix C
Computer (or computers) with drawing software		Enough computers in classroom for teams to share, or access to a computer lab	Available in most schools Options for drawing software include: • Sketchpad [Web Link] • Chogger [Web Link]
Paper, rulers, and markers for diagrams		Enough items for each team	Available in most schools

Day 10: Selling it to NASA

Introduction (10 minutes)

Show students one or two identified commercials for a product or toy. Ask students why the commercial was made. *To whom is the commercial targeted? What claims or evidence does the advertisement present?*

Talk to students about the last step of the design process. When engineers are working on projects, they must frequently give presentations. As their work progresses, they give presentations to their departments for feedback in a Technical Interchange Meeting (TIM).

Presentations that have already been reviewed and are ready for the finishing touches are subject to Preliminary Design Reviews (PDR), which is when engineers get feedback and editing ideas from their coworkers.

When engineers present to their clients during Critical Design Reviews, they must "sell" their design to the client and prove that it meets the established criteria. If the client approves the design, then the project moves through the budgeting and fabrication stages.

Tell students they are to prepare a Critical Design Review presentation for NASA based on their work during this module. Encourage students to make work assignments in their team. The presentation must include:

- Diagram of the optimized rocket design—with verbal commentary
- Cost analysis based on the recommended materials and an explanation of why those materials should be used
- Verbal explanation of the design features, why they are optimal, and what the team learned during their testing trials; reference to collected data is ideal
- Final edited version of the letter to NASA including design solutions and justifications for all elements of the mission

Helpful Tip

Review the **Presentation Rubric** (**Appendix C**) with students before they begin to work on them.

Each presentation should last no more than 5 minutes.

Design Work: Presentation Preparation (20 minutes)

Give the student teams 20 minutes to put together their presentations. Depending on time constraints, students can either give their presentations to other engineering teams or to the whole class. Presentations should be scored using the Presentation Rubric (Appendix C) provided.

Helpful Tip

If more time is needed, add another day for students to prepare and give presentations.

Whole Group Discussion: Final Presentations (15 minutes)

Student teams give their final presentations to their classmates.

Lesson Close (5 minutes)

After presentations are finished, have students address the following questions as they complete their reflections in their science notebooks:

- *Did you enjoy this module? Why or why not?*
- *What did you learn?*
- *What surprised you about the engineering design process?*
- *How does this experience relate to something in your daily lives or the products/machines you most like to use?*
- *After this, what would you like to study and learn next?*

Assessment Opportunities

Use the final presentation and NASA letter as a summative assessment for student progress on all identified performance expectations.

Reference Appendix B for suggestions for meeting the needs of all learners.

Community Connections

Consider a showcase design presentation from each team. Invite engineers, designers, and entrepreneurs to create a “shark tank” or “high stakes” environment.

Suggested Teacher Resources

Meeting the Needs of All Learners	Mission to Mars Teacher Handbook, Appendix B
Presentation Rubric	Mission to Mars Teacher Handbook, Appendix C