

Mars Rover Celebration NGSS Alignment

WEEK 3: DESIGNING THE MISSION
LESSON 6: MISSION MEASUREMENTS
GRADE LEVEL: 3-5

PERFORMANCE EXPECTATIONS

In the NGSS framework, one of the important things that teachers need to do is explicitly identify when Science and Engineering Practices (SEP) and Cross Cutting Concepts (CCC) are being covered. The SEP's and CCC's are pervasive throughout the Mars Rover Celebration curriculum. The tables here are intended to assist the teacher in deciding when to mention that an SEP or CCC is part of the material being presented.

Lesson Objectives		
Students who demonstrate understanding can: <ul style="list-style-type: none">• Refine their team's scientific question so that it can be answered by data and/or modeling• Brainstorm possible missions for the scientific question chosen• Determine reasonableness of proposed missions• Use the brainstorming process to enhance meaningful learning• Use the proposed mission matrix worksheet to help determine the most practical mission		
3-5 Engineering Design		
3-5-ETS1-2 Generate and compare multiple solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.		
SCIENCE AND ENGINEERING PRACTICES (SEP)	DISCIPLINE CORE IDEAS (DCI)	CROSSCUTTING CONCEPTS (CCC)
Planning and Carrying Out Investigations Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon	ESS1: Earth's Place in the Universe: ESS1.B: Earth and the Solar System ETS1: Engineering Design: ETS1.B: Developing Possible Solutions	System and System Models A system can be described in terms of its components and interactions.
Constructing Explanations and Designing Solutions Generate and compare multiple solutions to a		

problem based on how well they meet the criteria and constraints of the design solution

SUMMARY OF THE THREE DIMENSIONS

The 5E lesson model provides the 5 phases of learning that helps to facilitate the process of science understanding. Teachers are encouraged to use the table below to help align their teaching methods with the embedded Science and Engineering Practices (SEP), Disciplinary Core Ideas (DCI) and Cross Cutting Concepts (CCC) present in the lesson.

5E MODEL PHASE	SCIENCE AND ENGINEERING PRACTICES (SEP)	DISCIPLINE CORE IDEAS (DCI)	CROSSCUTTING CONCEPTS (CCC)
ENGAGE	Planning and Carrying Out Investigations	Earth and the Solar System	Systems and System Models
EXPLORE	Planning and Carrying Out Investigations	Earth and the Solar System Developing Possible Solutions	Systems and System Models
EXPLAIN	Constructing Explanations and Designing Solutions	Earth and the Solar System Developing Possible Solutions	Systems and System Models
ELABORATE	Constructing Explanations and Designing Solutions	Earth and the Solar System	Systems and System Models
EVALUATE	Performance Expectations	Performance Expectations	Performance Expectations