

# Mars Rover Celebration NGSS Alignment

**WEEK 5:** DESIGNING AND BUILDING  
**LESSON 11:** BRAINSTORM AND PRELIMINARY DESIGN  
**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"><li>Identify, become familiar with and use the Engineering Design Process</li><li>Use the Engineering Design Process to sketch a reasonable drawing of the rover that will be built</li><li>Use the steps of the Engineering Design Process to sketch their team's Mars Rover prototype</li><li>Develop a concept map to communicate requirements and features of the rover</li></ul>		
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)
<b>Asking Questions and Defining Problems</b> Define a simple problem that can be solved through the development of a new or improved object or tool	<b>ESS1: Earth's Place in the Universe:</b> ESS1.A: The Universe and Its Stars ESS1.B: Earth and the Solar System	<b>System and System Models</b> A system can be described in terms of its components and interactions.
<b>Obtaining, Evaluating and Communicating Information</b> Obtain and combine information from books and/or other reliable media to explain	<b>ETS1: Engineering Design:</b> ETS1.B: Developing Possible Solutions	

phenomena or solutions to a  
design problem

## 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	Asking Questions and Defining Problems	Earth and the Solar System	Systems and System Models
EXPLORE	Asking Questions and Defining Problems	Earth and the Solar System	Systems and System Models
EXPLAIN	Obtaining, Evaluating and Communicating Information	Earth and the Solar System Developing Possible Solutions	Systems and System Models
ELABORATE	Obtaining, Evaluating and Communicating Information	Earth and the Solar System Developing Possible Solutions	Systems and System Models
EVALUATE	Performance Expectations	Performance Expectations	Performance Expectations