

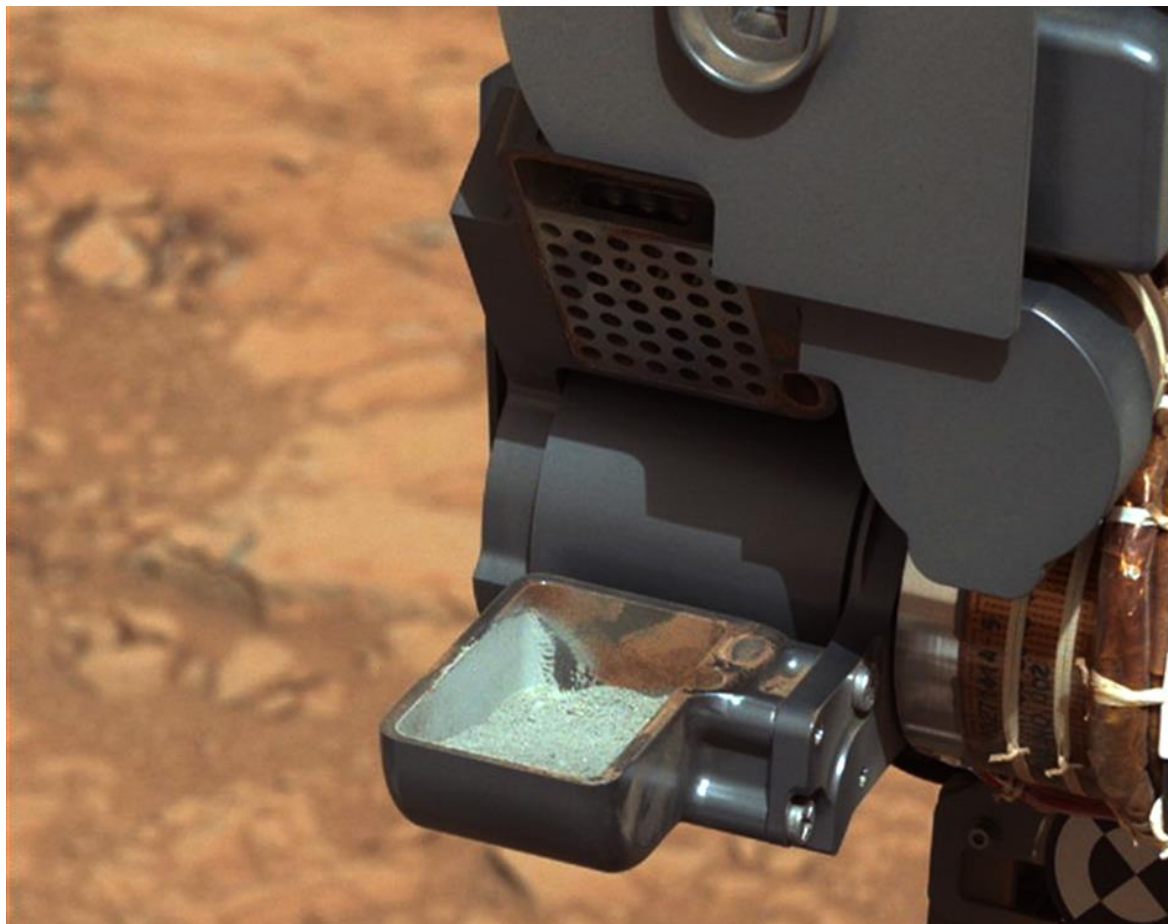


# Mars Rover Celebration

## Curriculum Module

### Week 3: Designing the Mission

#### Lesson 8: Where is the Best Place to Measure?



Educational Product	
Educators & Students	Grades 6-8

[www.marsrover.org](http://www.marsrover.org)

# Week 3: Designing the Mission

<b>LESSON 8:</b>	WHERE IS THE BEST PLACE TO MEASURE?
<b>GRADE LEVEL:</b>	6-8
<b>LENGTH:</b>	1 DAY
<b>VOCABULARY:</b>	control variable

## MATERIALS:

- Video: [Mars Rover Curiosity Trailer](#)
- Video: [The Challenges of Getting to Mars: Selecting a Landing Site for MSL Curiosity](#)
- Interactive: [NASA Explore Mars! Gale Crater](#).
- Google Earth- Previously downloaded for Lesson 3
- Science Notebooks
- Chart paper

\*Administrator access is needed to download and install the required plug-in for the NASA Explore Mars! Gale Crater interactive module. Teachers without administrator access on their computers should consult their technology department for assistance prior to beginning this lesson.

## ESSENTIAL QUESTION:

How did you select the place for your Mars rover mission? Describe how your selected site meets the needs of your question.

## LESSON OBJECTIVE(S):

Students will be able to:

- Determine a landing site for their Mars Rover
- Work with their team to summarize information and identify important details in non-fiction writing
- Use technology skills to research Gale Crater through an online interactive module
- Learn about features of Mars through use of Google Earth Mars
- Gather, and analyze data to conduct a scientific experiment
- Collect and record data to draw logical and scientific conclusions
- Define and identify the role of constants and variables in teams' scientific or technical questions
- Differentiate between weather and climate

## ENGAGEMENT

1. At the beginning of this lesson, and using the attached documents, present the Essential Question and Key Vocabulary for students to consider during the lesson.
2. To encourage student motivation, students will view [Mars Rover Curiosity Trailer Video](#) (Runtime: 1:37) and briefly discuss the importance of making discoveries on other planets. Students will work with their teams to remember/identify what their specific mission will aim to discover.

Next, lead students through a discussion of the importance of selecting an appropriate landing site for their rovers. Tell students that there was a great deal of discussion and research to select where Curiosity would land and show the video [The Challenges of Getting to Mars: Selecting a Landing Site for MSL Curiosity](#) (Runtime: 3:51)

## EXPLORATION

1. Students will begin to explore Gale Crater, the selected landing site for the Curiosity rover at the [NASA Explore Mars! Gale Crater](#).
2. Using their Science Notebooks as a guide, students will identify some constants, independent variables and dependent variables. Then, students will write their observations of why Gale Crater was a good place for Curiosity to land.
3. Once students have gained some background knowledge in identifying constants, dependent variables and independent variables, students should work in their groups to review their scientific or technological question.
4. Using the information learned in the mini-lesson, students will use their scientific or technological question to identify the controls they will need when selecting their own landing site. Students will also identify the dependent and independent variable(s) that will help them to collect relevant and accurate data.
5. After students have explored, they may use Google Earth Mars to explore a landing site for their team rover.
6. Once students have decided where they will land their rover, students will collect pertinent information about their site in their Science Notebooks and explain how their chosen site will help them to answer their chosen scientific question.

## EXPLANATION

1. Students will write their main details on a piece of chart paper and share their results with the class:
  - Chosen Landing Site
  - Exact location on Mars
  - Three reasons why this site was chosen
  - How this landing at this site will help answer the team's scientific question

## ELABORATION

1. If time allows, students may explore Gale Crater on Google Earth Mars. Students should focus on collecting data to provide evidence for how the complex interactions of air masses result in changes in weather condition over time.
2. Students may also opt to further investigate their chosen site and/or add additional information to their team chart paper.

## EVALUATION

1. During this lesson, the teacher is encouraged to use formative assessments to determine and deepen student understanding. Teachers may wish to grade students' science notebooks to establish student understanding or assess student graphs and analyses/summaries.
2. Teachers are encouraged to create their own grade-level and ability-level assessments so as to best meet the needs of their students.

## SUPPLEMENTAL RESOURCES

Mars Rover Curiosity Trailer

<http://www.jpl.nasa.gov/video/index.php?id=1014>

The Challenges of Getting to Mars: Selecting a Landing Site for MSL Curiosity

<http://www.jpl.nasa.gov/video/index.php?id=985>

Explore Mars: Curiosity

<http://mars.jpl.nasa.gov/explore/galecrater/>

Supplemental Videos

<http://mars.jpl.nasa.gov/msl/multimedia/videos/index.cfm?v=120>

MSL Landing Site Selection

<http://mars.jpl.nasa.gov/msl/mission/timeline/prelaunch/landingsiteselection/>

What to look for in a Landing Site

[http://www.racetomars.ca/mars/article\\_landing.jsp](http://www.racetomars.ca/mars/article_landing.jsp)

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