

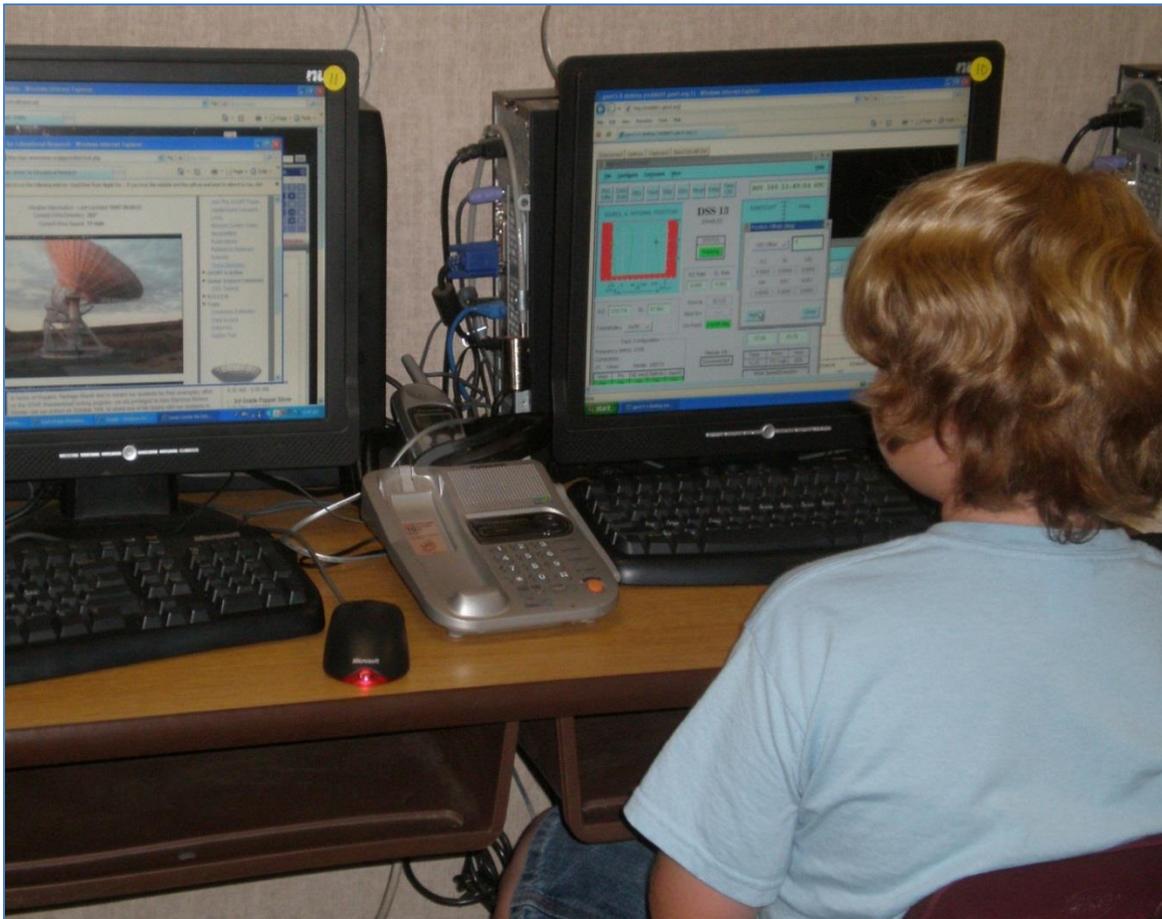


Mars Rover Celebration

Curriculum Module

Week 1: Learning Research Skills

Lesson 3: Research Tools and Skills



Educational Product	
Educators & Students	Grades 6-8

Week 1: Learning Research Skills

LESSON 3: RESEARCH TOOLS AND SKILLS

GRADE LEVEL: 6-8

VOCABULARY: plagiarism
research

MATERIALS:

- [Google Earth](#)- Download and install prior to the lesson. See *Introduction to Google Earth Mars* for detailed instructions.
- Computers with internet access
- Informational Text Features Power Point presentation
- Informational Text Features Power Point presentation handouts for students (optional)
- Science Notebooks

ESSENTIAL QUESTION:

Which of the informational text features you learned about today was the most helpful to you in researching information for your Mars Rover project?

LESSON OBJECTIVE(S):

Students will be able to:

- Learn about features of Mars through a demonstration of Google Earth Mars
- Gather, and analyze data from multiple sources on the internet as well as print sources
- Develop and use strategies for reading informational text to systematically find information
- Differentiate between paraphrasing and plagiarism and identify the importance of citing valid sources
- Understand that Earth and Mars have similar geological features

Note: Prior to the lesson, visit <http://earth.google.com/mars/> to download and install Google Earth. This software will be used throughout the project.

ENGAGEMENT

1. Use the attached documents, present the Key Vocabulary and the Essential Question for students to consider during the lesson. In addition, show the Informational Text Features Power Point (view before presenting).

Note: When the presentation is opened, a dialog box may appear. No password is needed to view the PowerPoint. Just click the *Read Only* option. The presentation is organized in such a way that the teacher may choose to show all of it or select only those sections students need. Note that each section of the text features begins with a table. To print out handouts for students, Go to *File>Print*. Under *Settings* choose *Notes* or *Handouts*.

2. Once Google Earth has been downloaded and installed, open the software to give students a tour of Mars. Depending on the comfort level of the teacher, a self-guided tour may be used. Otherwise, students will view a pre-recorded tour narrated by Bill Nye (Runtime: 08:24). Watch the tutorial video at the download site or refer to the “Introduction to Google Earth Mars” handout for instructions on how to begin the tour.
3. While students are taking their tour of Mars, students should be answering the corresponding questions in their Science Notebooks. To assist students in taking notes, point out the first answer throughout the tour.
4. Once the video concludes, discuss answers as a class.

EXPLORATION

1. To help students learn how to research Mars, students will be using a search engine to find facts and features of Mars through an internet scavenger hunt.
2. Begin by directing students to their Science Notebooks. Demonstrate how to answer the first question by:
 - Identifying the term to be typed into the search engine.
 - Determining how to pick an appropriate link from the search results and locate the correct answer from the selected page.
 - Modeling how to write the answer in the Science Notebook being sure students understand how to paraphrase (rather than plagiarize).
3. After modeling the first question and answer with students, students may work as a team or in pairs to complete the remainder of the research questions in their Science Notebooks.
4. Circulate as students work assisting when necessary.

Note: Teachers may elect to use a search engine in lieu of the specific web sites provided. To assist students in executing safe searches on the internet, a student-friendly search engine such as Sweet Search (<http://www.sweetsearch.com>) or other district approved search engine is recommended.

EXPLANATION

1. After students have had time to research answers through numerous sources, review the questions and solicit answers from students.
2. Be sure to ask where the information came from and discuss how students chose which sites to use.
3. Send students back to their teams to discuss the answers they found and whether they came from credible sources. Once they have narrowed down their answers to information that came from credible and reliable sources, students should discuss what they learned about Mars through this activity and complete the accompanying Venn Diagram in their Science Notebooks. Venn Diagrams may be completed in teams, partners, or individually.

ELABORATION

1. Students should continue to research Mars for the duration of the lesson. Students should focus on analyzing and interpreting data to determine Mars’ scale properties (such as the sizes of Mars’ layers, surface features and orbital radius).
2. Students are encouraged to seek Research Mentors (experts in their fields) who can answer questions and help make connections between their research and STEM Careers.
 - One expert who students may be familiar with is Janice VanCleave, author of many children’s science experiment books. In collaboration with this project, Ms. VanCleave has generously offered her assistance as a Research Mentor and can be contacted at askjvc@aol.com.
 - Another venue for finding Research Mentors is the American Institute of Aeronautics and Astronautics. AIAA professional members often answer questions for K-12 students to support STEM education. AIAA can be contacted at askanengineer@AIAA.org.

Note: It is important that students understand that it is not acceptable to seek a mentor on their own and should always check with their teacher or parent first.

EVALUATION

1. During this two day lesson, the teacher is encouraged to use formative assessments throughout the lesson to determine and deepen student understanding. Teachers may wish to grade team or individual Venn Diagrams and/or review students' science notebooks to establish student understanding.
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

For Students

Kid's Cosmos: Facts about Mars

http://www.kidscosmos.org/solar_system/mars.php

Planets for Kids- Mars

<http://www.planetsforkids.org/planet-mars.html>

The Nine Planets- Mars

<http://kids.nineplanets.org/mars.htm>

Welcome to the Planets

<http://pds.jpl.nasa.gov/planets/choices/mars1.htm>

Mars Rover Celebration Web Site

<http://marsrover.phys.uh.edu/MarsCurriculum.php#MarsResources>

For Teachers

World Wide Telescope

<http://www.worldwidetelescope.org/Home.aspx>

Discover the Red Planet with World Wide Telescope

<http://www.worldwidetelescope.org/whatis/whatIsWWT.aspx?Page=Mars>

NASA Planetary Data System

<http://pds.nasa.gov/>

Books:

Moons and Planets, William K. Hartman, 5th Edition, Brooks Cole, 2004. ISBN-13: 978-0534493936

The New Solar System, J. Kelly Beatty, Carolyn Collins Petersen, Andrew Chaikin, 4th Edition, Cambridge University Press, 1999. ISBN-13: 978-0521645874

Destination Mars: New Explorations of the Red Planet, Rod Pyle, Prometheus Books, 2012. ISBN-13: 978-1616145897

<http://www.uapress.arizona.edu/onlinebks/MARS/CONTENTS.HTM>

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