

Red Planet:

Read, Write,
Explore!

Welcome to the Program!

STEM education has been gaining *STEAM* recently, with many arguing to include “A” —the Arts—in STEM instruction since creativity is vital for innovation. Brain research provides good arguments in support of STEAM as well, suggesting literacy and art in combination with *any* topic of instruction aids with comprehension and improves the ability to recall information later (Banikowski, 1999). Science lessons with embedded writing tasks beyond recording and summarizing have been shown to help students solidify understanding of complex ideas and processes (Abell, 2011), and there is also evidence that drawing in science motivates students, helps them organize information, and provides a visible way to communicate ideas to peers (Ainsworth, et al, 2011).

With this in mind, we created the **Red Planet: *Read, Write, Explore!*** program. Red Planet is a set of six standards-based science lessons including reading, writing, and art activities for grades 3-5, created for the Mars Atmosphere and Volatile Evolution (MAVEN) mission to Mars. The Red Planet program encourages students to think both scientifically and creatively about planetary science and habitability. It can be used as a complete sequence of lessons, or individually to fit your curriculum.

Recommended Reading

Red Planet: *Read, Write, Explore!* suggests books to accompany each lesson. All are available through online retailers, although we encourage you to consult your school librarian or local library system to obtain books for the program. It is not required to have every book, and you may also substitute other Mars books when appropriate. All below are recommended; however, those marked with a star are highly recommended as specifically useful for students to complete Red Planet activities.

Asimov, Isaac. 2002. *Mars*. New York: Prometheus Books. (Grades 4 and up)

☆ Bennett, Jeffrey. 2006. *Max Goes to Mars*. Boulder, Colo.: Big Kid Science. (Grades 2 and up)

☆ Breidahl, Harry. 2002. *Dark Secrets: Life Without Sunlight*. Broomall, Penn.: Chelsea House Publishers. (Grade 4)

Getz, David. 1997. *Life on Mars*. New York: Henry Holt and Company, LLC. (Grades 3 and up)

Kobasa, Paul ed. 2007. *Solar System and Space Exploration Library: Mars*. Chicago. (Grades 3 and up)

Landau, Elaine. 2008. *Mars*. Canada: Scholastic. (Grades 2 and up)

Loewen, Nancy. 2008. *Seeing Red, The Planet Mars*. Minneapolis: Picture Window Books. (Grades K and up)

☆ Murray, Stuart. 2004. *Eyewitness Mars*. London: DK Publishing, Inc. (Grades 3 and up)

☆ Ride, Sally and Tam O'Shaughnessy. 2006. *The Mystery of Mars*. San Diego: Sally Ride Science. (Grades 2 and up)

Schorer, Lonnie. 2010. *Kids to Space Club: Are We There Yet?* Ontario: Apogee Books. (Grades 3 and up) Available here:
<http://www.cgpublishing.com/Books/For%20Kids/KidstoSpaceClub.html>

Scott, Elaine. 2008. *Mars and the Search for Life*. New York: Clarion Books. (Grades 5-9)

Vogt, Gregory L. 2007. *The Biosphere: Realm of Life*. Minneapolis: Twenty-First Century Books. (Grade 5)

The Lessons

Lesson 1: A Quick Trip to Mars

Using Google Earth/Mars and the recommended reading, students compare and contrast Earth and Mars with a Know-Wonder graphic organizer.

Lesson 2: Hanging Mars Out to Dry

Students illustrate a scene from Mars history with a paragraph description, and place their work along a clothesline in the classroom to create a timeline.

Lesson 3: Going to Extremes

Groups of students conduct an experiment on chia seeds to explore how extreme environments affect the growth of the plant. After conducting the experiments, they write and illustrate a fact-based fictional story about an imaginary life form on Mars.

Lesson 4: Surviving and Thriving on Mars

Students consider what Mars is like, and describe things they would need to survive and thrive in the Martian environment.

Lesson 5: Mars in the Future!

Students create a scripted travel video or commercial, or construct a brochure or website, to convince people to visit a fictitious base on Mars. Students tie in what they've learned about Mars to construct their final project.

Lesson 6: Know-Wonder-Learned

Students revisit their Know-Wonder chart from Lesson 1, and add what they have Learned during this program.

Student portfolios are encouraged during this program so students can revisit and reflect on their work or share with other classmates. We also recommend having students create a pictorial vocabulary book to further enhance the program. We hope you enjoy **Red Planet: Read, Write, Explore!**, and we look forward to your feedback!



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Additional Online Resources:

The STEM Education Coalition
<http://www.stemedcoalition.org/>

STEM to STEAM
<http://stemtosteam.org/>

References:

Abell, Sandra K. 2011. "On Writing in Science." Pp. 5-9 in *Science the "Write" Way*, ed. Jodi Wheeler-Toppen. Virginia: NSTA Press.

Ainsworth, Shaaron, Vaughan Prain, and Russell Tyler. 2011. "Drawing to learn science." *AAAS 333*: 1096-1097.

Banikowski, Alison K. 1999. "Strategies to Enhance Memory Based on Brain-Research." *Focus on Exceptional Children 32*(2).

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