



THE BOOK OF SPACE ROCKETS

Clever Cogz Series
The Book of Space Rockets
by Neil Clark
ISBN: 9781786036339
\$14.95 US/\$19.95 CAN
24 pages, color illustrations
Hardcover, 8 x 8 inches

Essential Questions in This Unit:

- What are different modes of space travel?
- What are different types of space rockets?
- How are rockets designed to operate and get into space?
- How do astronauts interact with space crafts, people on Earth, and each other?
- What are other space machines besides rockets?
- What are significant space travel moments in history?

Learning Objective: A fun and fascinating look at vehicles that travel to space is the focus of this addition to the Clever Cogz series. Targeted at younger children – and anyone looking for a quick lesson on space travel – the book uses simple factual text and engaging illustrations to teach readers about such themes as vehicle design and fuel, satellites, the Mars Rover, the space station, and more. Students will be challenged to think about how space travel is physically possible, the history of space travel, and the various crafts that allow humans to explore the galaxy.

Classroom Discussion Topics:

- 1.** Ask the class to discuss different modes of space travel, especially those featured in the book. These include rockets, the Mars Rover, and the International Space Station. What other methods of transportation to space exist? Would students like the opportunity to travel to space? What would be their method of choice? Talk about what they might need for training and equipment as well as what their expectations would be of traveling in space.
- 2.** Look deeper at the physics behind how rockets travel, discussing the concepts of propulsion, gravity, and speed. What other air or ground crafts use these same concepts? Then talk about rocket engineering that allows them to travel, making sure to dive into rocket design. What happens at different stages? How does this help the rocket? What is the rocket payload?
- 3.** Create a classroom discussion about satellites in all forms, including natural satellites and man-made ones. Why do natural satellites exist in space, and how do we identify them? Which ones are notable to scientists? As for man-made satellites, what do we use them for? How might children interact unknowingly with satellites in space every day (e.g., television or Internet)? You might create a comparison list of different satellites and ask each student to identify which column each one falls into.
- 4.** Contrast and compare vehicles that we see every day with space machines. What makes them similar or different? Could we use versions of space vehicles on the ground? Some points of similarities to discuss are controls, wheels, fuel, and engines. Differences might be that space machines are used only once, they cost much more to build, and their material must withstand the earth's atmosphere and other space environments.
- 5.** Facilitate a group discussion about why space travel is important or necessary, making sure to ask them why, but also extending it to other specific people and countries. What do companies, organizations or countries get out of it? What about the human race as a whole? You may want to bring up technological and industrial advances (e.g., electronics and mining), health advances, and science benefits like the study of weather.
- 6.** Using online sources, look at historical photos and videos with the class about space travel, including the first lunar landing in 1969 as well as recently photographed planets like Jupiter and Mars. What are their impressions? Are they more or less than what scientists expected? Was there any fanfare around the reception of the images or events at the time? Talk also about the length of time to receive the images from the space machines, making sure to discuss distance to planets and weather conditions (much information exists online about this).

Student Activities:

1. Build a series of classroom space balloon rockets using balloons of different sizes and filled with varying amounts of air, then host a classroom launch while discussing the physics and engineering behind the rockets. Be sure to talk about the laws of motion as well. Students can then record data from the rocket launches, such as distance travelled and how inside air affects the data. You might also consider having classroom balloon rocket races!
2. Ask students to look at the nighttime sky, if possible, through a telescope if they have one, or an app on a parent's phone (such as Night Sky Lite or SkyView Free) – you may live in an urban area that makes it difficult to see a clear sky. What do they see? Get them to record their sky observations, making sure to log the time, direction, and distance from the horizon. Be sure to have them look especially for satellites. Afterward, keep a cumulative classroom chart of all the students' findings, or even recreate the nighttime sky illustration.
3. Facilitate a discussion on space station living, challenging students to research what life is like for astronauts who live there for months at a time. Get students to pretend what their life on a space station would be like, asking them to keep a

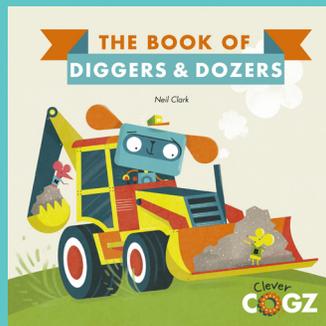
journal of their stay. What would be part of their day-to-day actions? What job would they prefer to have? You may even do a classroom play with different students acting in different roles. You may also challenge them to draw pictures or create art project in relation.

4. Think about a series of history reports that ask children to interview someone who experienced a significant space exploration event. Do students have a parent, grandparent or other family relative or friend who was alive at the time of the first time man walked on the moon, on July 20, 1969? Or, what about another remarkable space exploration event, such as the explosion of the space shuttle Challenger in 1986? Students can ask them where they were, what they remember, and who they were with. Then they can deliver their reports in front of class.
5. Ask the class to research the future of space travel independently, then come back together to discuss their findings. What is in the works now from governmental entities (e.g., NASA) or through private individuals (e.g., Elon Musk)? After talking about what students would like to see explored or worked on – and through what means of space vehicle – get them to create 3-D art projects that show this using different materials.

Further Reading:



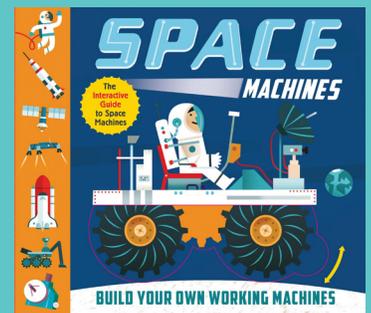
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