

# WORKSHOP EXTENSION ACTIVITY

Built by The Home Depot Kids Workshop

## MAKE, CREATE, EXPLORE

Ages 5-12

As space exploration advances, it's likely that one day you'll be able to travel farther from Earth than ever before—and you're going to need a rocket to get there. So in the meantime, check out the facts below and see what you can learn about these out-of-this-world vehicles!

### Rocket History: Then and Now

#### Question: When were rockets invented?

Answer: Rockets aren't a new phenomenon . . . they date all the way back to the 1200s! About 800 years ago, they were first used in China as fireworks. However, it wasn't until 1898 that a Russian teacher named Konstantin Tsiolkovsky came up with the idea of using rockets to explore space. As a result, rocket engineering began in the early 1900s<sup>1</sup>.

#### Question: When did rockets begin taking people to outer space?

Answer: In April of 1961, Yuri Gagarin became the first human to enter space using a rocket launched by the Soviet Union. Following this launch, Yuri orbited Earth in a space capsule for 89 minutes<sup>2</sup>. Less than one month later, Astronaut Alan Shepard became the first American to enter space aboard the Freedom 7 Space Capsule

#### Question: What are rockets used for today?

Answer: Rockets are used for science! They launch satellites, space capsules, telescopes, and even space stations into space. Rockets have also sent

astronauts as far as the far side of the moon. One day soon, a rocket may be able to help humans visit Mars for the first time!

### Rocket Physics

Sir Isaac Newton's Third Law of Motion states that for every action, there is an equal and opposite reaction. A rocket is able to launch into space because it burns fuel into hot gas, which is pushed out of the back of its engine as exhaust. As the rocket pushes the exhaust backwards, the exhaust thrusts the rocket forward.



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## Rocket Fun Facts

- Rockets can be crewed or uncrewed! A crewed rocket goes up with at least one person in it. An uncrewed rocket goes up without any people inside. Crewed rockets often travel slower than uncrewed rockets because the human crew must be protected.
- Rockets travel faster than the speed of sound! They can reach speeds of 30,000 kilometers per hour when in orbit. (That's more than 286 times faster than a car driving on the highway!)
- Earth travels around the Sun at a speed of 66,000 miles per hour. At the equator, Earth spins about 1,000 miles per hour to make one full rotation in a day. When rockets are aimed in the same direction that Earth is already traveling, they are able to save fuel and time<sup>3</sup>.

## Interested in learning more about rockets and space travel?

Check out these resources for a chance to further investigate other planets, explore space, and even participate in some real-life science!

- NASA Space Place: [spaceplace.nasa.gov/](https://spaceplace.nasa.gov/)
- Google Sky: [google.com/sky/](https://google.com/sky/)
- Space-Focused Citizen Science Opportunities: [zooniverse.org/projects](https://zooniverse.org/projects)

## Sources

1. Brief History of Rockets. NASA. [grc.nasa.gov/WWW/k-12/TRC/Rockets/history\\_of\\_rockets.html](https://grc.nasa.gov/WWW/k-12/TRC/Rockets/history_of_rockets.html).
2. What is a Rocket? NASA. <https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-a-rocket-k4.html>.
3. NASA Space Place. [spaceplace.nasa.gov/launch-windows/en/](https://spaceplace.nasa.gov/launch-windows/en/).

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