

Grades: 6-8

Nova, “Rise of the Rockets”

Marvel at a new era of space exploration and accessibility, thanks to NASA's return to crewed spaceflight, as well as private companies like SpaceX and Virgin Galactic, and technologies that make rockets cheaper and more powerful than ever.

After watching this episode, choose from the following questions and/or tasks to extend your learning

Question Box 1

- Using evidence from the show, explain why is “Rise of the Rockets” a good title for this TV program?
- What is this program “saying”? Cite evidence to support your analysis.
- Provide at least two quotes of evidence that support the main claims.
- What is the central idea (main claim or thesis) of the text? Is there a quote from the TV show that represents the author’s central idea?
- Choose 2-3 unfamiliar words for the program and define them.
- What is the new era of space exploration and accessibility?
- Why is a privately-owned company taking astronauts into space?
- Explain how rockets are launched.
- What role did Tsiolkovsky play in calculating the fuel needed to lift a rocket into space?
- What did the RR25 show scientist?
- Why not reuse rockets like an airliner?

Question Box 2

- How do you feel about this program? What parts of it do you particularly like?
- How much did you know about the subject before the show started?
- How do you feel about this TV show?
- What did/do you enjoy about this program?
- What one thing would you particularly want people to notice when they watch this TV program?
- Do you agree with the privatization of the Space program? Why or Why not?
- SpaceX just successfully launched astronauts into space recently. Would you ever be interested in going into space? Why or Why not?
- What is Virgin Galactic and what does it hope to accomplish?

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Box 3 (Tasks)

- On April 30, 2020 NASA announced that SpaceX had won \$135 million to design a variation of the Starship with the intent of taking astronauts to the moon in the mid-2020s. Create a linear graph that shows the amount of money spent over time. Create a non-linear graph that shows the amount of money spent over time. Explain the key features of both graphs.
- Virgin Galactic's SpaceShipTwo will carry six passengers up to 100 kilometers, the point where astronaut wings are awarded. A 90-minute flight costs \$250,000. Virgin Galactic has already received \$80 million in deposits from future astronauts. How many potential astronauts could there be? Justify your reasoning using mathematics.

Box 4 (Enrichment)

- Discuss with evidence, how much less fuel would need to be used to launch a rocket from the moon into space as opposed to launching from Earth.
- Research private space companies and discuss their future missions.
- Research and describe innovations in rocket design used today.
- Research and discuss innovations in rocket engine design being used today. Design your own rocket engine. What are some key considerations?

Box 5 (Extend/Real-Life)

- What are some current private space agencies in practice today?
- What are some careers associated with space travel?
<https://www.bls.gov/careeroutlook/2016/article/careers-in-space.htm>
- If you wanted to be an astronaut what schooling would you need to consider? Think about your career options and look at some colleges, universities and/or trade schools that would support your career choice. What do you need to do to prepare for college now?