

STEM AT-HOME

Quarter 4 (Aerospace)

STEM Hours Credit:

You will receive credit for STEM hours for working on these project(s) along with a stamp in your STEM passport! Please report back to us what you did and how long it took on the link. **Please submit a google form for each project.** ([Link](#) to google form)



Hands-On Aerospace STEM Projects



1. Paper Airplane Engineering Challenge

- Design 3 different plane styles.
- Test for distance, accuracy, and airtime.
- Measure and graph results.
- Modify wings (length, width, winglets) and retest.

Extension: Research how wing shape affects lift (Bernoulli principle).



2. Balloon Rocket Lab

Materials: String, straw, balloon, tape

- Thread string through straw.
- Tape inflated balloon to straw.
- Release and measure travel time.

Experiment Variables: Balloon size, String angle, Payload (paper clips)

3. DIY Satellite Model

- Build a model satellite from recycled materials.
 - Label:
 - Solar panels
 - Antenna
 - Sensors
 - Research what real satellites do (weather, GPS, communication).
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4. Parachute Drop Challenge

- Use coffee filters or plastic bags.
 - Attach different weights.
 - Time descent rate.
 - Discuss air resistance and drag.
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5. Moon Crater Simulation

Materials: Flour, cocoa powder, small rocks

- Drop rocks from different heights.
- Measure crater diameter.
- Graph results.

Connect to meteor impacts.



6. Alka-Seltzer Film Canister Rockets

- Add water + half tablet.
- Seal and step back.
- Measure launch height.

Discuss chemical reactions and pressure.



Online Aerospace Resources



NASA for Students

NASA

- NASA STEM @ Home activities
- Engineering design challenges
- Mars and Artemis mission info
- NASA Kids' Club

Website: nasa.gov/stem

NASA Jet Propulsion Laboratory (JPL)

Jet Propulsion Laboratory

- “Teachable Moments”
 - Mars rover design challenges
 - Spacecraft engineering videos
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European Space Agency (ESA) Kids

European Space Agency

- Space animations
 - Rocket science basics
 - Interactive games
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YouTube Channels (STEM-Friendly)

Mark Rober

Mark Rober

- Engineering challenges
- Rocket builds
- NASA background insights

SciShow Kids

SciShow Kids

- Kid-friendly space science
- Planets and gravity explained simply

Smarter Every Day

Smarter Every Day

- Rocket science
 - Slow-motion physics
 - Aerospace engineering explanations
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Aerospace Design Thinking Challenge

Mission Prompt:

“Design a spacecraft that can safely land on Mars and protect 3 astronauts.”

Students must include:

- Power source
- Food supply
- Landing system
- Communication system



Aerospace Career Exploration

Students could research careers such as:

- Aerospace engineer
- Astronaut
- Drone pilot
- Air traffic controller
- Mechanical engineer
- Astrophysicist

Have them create:

- A one-page career poster
 - A “Day in the Life” video
 - A future mission proposal
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Drone Exploration

If families have access to drones:

- Practice controlled takeoffs/landings
 - Map a small yard area
 - Research FAA drone rules (older students)
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Movies or TV Shows that will inspire STEM learning about Aerospace:

Fly Me to the Moon
Wall-E
Super Wings (TV Show on Netflix)
Magic School Bus Takes Flight
All About Planes
Flight School
Air Force Elite: Thunderbirds
Hidden Figures
The Boy Who Harnessed the Wind
Fight for Space
October Sky
Apollo 13

TIP LINE

If you find a great video or experience online that you think families would enjoy, please share it with us **by emailing our STEM coordinator, Gina Wiitanen, at grwiitanen@mpsomaha.org** and we will continue to add to our list of at-home opportunities!