



## Astronaut

A T T F O R C E S  
M S C R S D T F W  
O G T L A J A M C  
T S G R A V I T Y  
I V M O O N E M A  
O C T Z D N D L P  
N Z G W D A A E C  
D R O P P E D U R  
E C H E I G H T T

### Word List

ASTRONAUT DROPPED TRAVEL FORCES MOON  
GRAVITY LANDER MOTION HEIGHT DATA

# 4-H at Home

ON THE GO LESSON



**INCLUDES**  
NOTECARDS | PLASTIC CUP | MARSHMALLOWS | STRAWS | TAPE

**4-H PROJECT AREAS**  
STEM | AEROSPACE



IOWA STATE UNIVERSITY  
Extension and Outreach



## INCLUDED SUPPLIES

- *Index Cards*
- *Plastic Cup*
- *Marshmallows*
- *Straws*
- *Tape*

## ADDITIONAL SUPPLIES

- *Scissors*

## BACKGROUND

Moon landers heading to the moon can travel as fast as 24,000 miles per hour! These spacecrafts need to slow their speed before touching the surface in order to land safely. Today you will explore gravity, motion and forces to build a lander that will help your “astronauts” (marshmallows) safely land when dropped from a height of one foot.

## DO REFLECT APPLY

Your design must include an open cup (no lids) with the two marshmallows inside. Consider how you will softly land your “astronauts” (marshmallows) using only the materials provided.

To begin, design a shock-absorbing system (a lander) and draw a model of it. Think about springs and cushions.

Build your lander using the supplies provided. Now, test your lander! Think about what worked well with your lander and what you might want to change after each test. Think about changes you could make and then test it again.

Take it higher. Drop your lander from different heights. Collect data as you test. Record items such as the test number, the height used, and whether your astronauts landed safely or not.

Discuss or write about the following: How did your design impact the astronauts’ landing? Which design was the safest? Where did you see

evidence of forces or gravity? Where else can shock-absorbing systems be used to keep people or objects safe?

Share it on social media with an adult’s permission, using the hashtag #4HatHome or #IowaSpaceGrantConsortium

## LEARN MORE

Thank you to our partner Iowa Space Grant Consortium! Link to full directions from NASA: <https://www.jpl.nasa.gov/edu/learn/project/make-an-astronaut-lander/>

Project areas are topics that 4-H members can learn about on their own, with a friend, at a club meeting, or at 4-H events. To learn more about the project areas you can explore in 4-H, please use our free resources online at <https://store.extension.iastate.edu/product/15266>

To get involved with 4-H in Cherokee County, please contact Debbie, Cherokee County 4-H Youth Coordinator, for more information.

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