



# MISSION FUTURE

ARIZONA 2045

## DESIGN A SPACE HELMET!

Space | Grades 4-8

A space helmet is vital for any astronaut traveling into space. The helmet can protect the astronaut's skull from any sudden impacts. Engineering your own helmet takes a lot of time and testing to perfect it. Using an egg to represent an astronaut's skull, design and test an egg-cellent helmet for your astronaut!



Never stop wondering.  
Never stop imagining.™

# DESIGN A SPACE HELMET!

## SUPPLIES

- One (1) Egg
- One (1) Sandwich Bag Per Egg
- One (1) Water Bottle
- One (1) Scissors
- One (1) Tape
- Any small materials around the house such as:
  - Cotton balls
  - Balloons
  - Small pieces of fabric
  - Tissue Paper
  - Cardboard
  - Popsicle Sticks
  - String

## CHALLENGE

### Can you engineer a safe space helmet to protect your astronaut?

1. Make an observation about your egg. *Where is it the most fragile? Where should you focus on protecting your astronaut?* Place your egg in a sandwich bag and place it to the side.
2. The water bottle will be the base for the helmet and can be used however your young engineer would like. HOWEVER, the egg in the bag has to be placed within the water bottle somehow.
3. Present additional materials that can be used as cushioning for your helmet. Feel free to set rules on how materials distribution will work (ex. *You can only pick 3 additional materials, tape counts as one material, etc.*).
4. Have the young engineer design a plan. They can draw and label their needed materials.
5. Once their design plan has been approved, they can start engineering their helmet! (Keep the egg in the bag for easy clean up).
6. When complete, determine your testing site with a consistent drop height. For example, the young engineer can stand on a chair and have their arm straight out.
7. TEST TIME! Drop the helmet and see what happens! *Was your astronaut protected?*
8. Use the following sheet to reflect on the results and plan for future testing.
9. For an added challenge and to make it more realistic, include a budget! Price the materials and try to make a cost-effective design while protecting your astronaut.

# DESIGN A SPACE HELMET!

Use the following sheet to reflect and improve your space helmet design for future tests.

| Test | Materials Used | Observation on Egg AFTER the drop | How well did your helmet protect your astronaut? | What changes would you make? |
|------|----------------|-----------------------------------|--|------------------------------|
| #1   |                |                                   |  |                              |
| #2   |                |                                   |  |                              |
| #3   |                |                                   |  |                              |