LESSON 7:

TAKE HOME ROCKETS

SUPPLIES

PENCIL BOX

- Pencils (20)
- Scissors (20)
- Clear Tape (2)
- Markers (2 of 12)
- Glue Sticks (5)

HANDOUTS FOLDER

- Rocket Parts Template (12)
- Construction Paper (40)

LESSON KIT #7

- Cardboard Tubes (20)

OBJECTIVES

- ☑ Students will explore basic rocket design
- ☑ Students will assemble a model rocket

HOOK

3-5 min

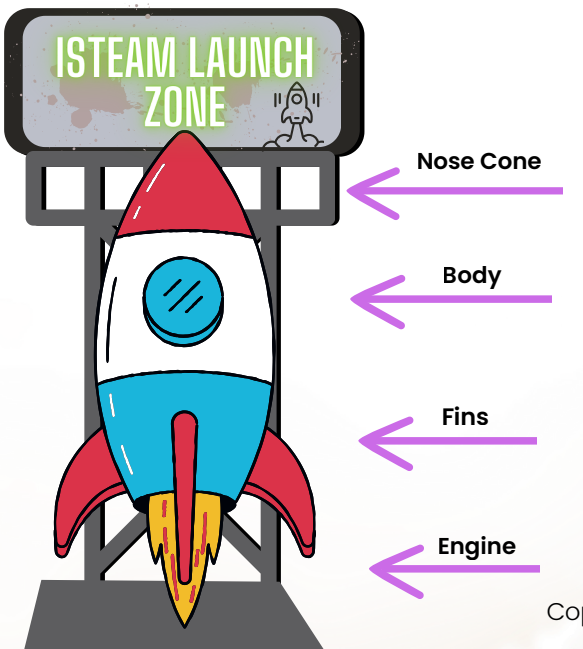
Today, you're a rocket scientist! NASA has chosen you to help design the next generation of space technology. Before we launch, your mission is to uncover the key components that help a rocket lift off the ground and soar into outer space!

INTRODUCTION

3-5 min

How do astronauts travel into space? They ride on a rocket!

Rockets are powerful machines that carry people and supplies beyond Earth's atmosphere. Scientists and engineers use rocket science to design rockets that can launch into space, overcome Earth's gravity, and explore the Moon, planets, and beyond. When a rocket leaves Earth's atmosphere, it must overcome gravity, air resistance, and extreme changes in temperature and pressure. Due to these extreme conditions, rocket ships are made with a few important components. These parts include, but are not limited to, the body, fins, nose cone, and engine.



LET'S LEARN ABOUT THE PARTS OF A ROCKET

- The nose cone is the pointed front end of the rocket that helps reduce air resistance and streamline its movement through the air.
- The body of the rocket is like its skeleton, providing structure and housing all the components needed for flight.
- Fins are attached to the body to help stabilize the rocket's flight path.
- Finally, the engine is the powerhouse of the rocket, providing the thrust needed to propel it into the sky.

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TAKE HOME ROCKETS

ACTIVITY

30 min

1. Pair students up or put them into groups of 3. Pass out the rocket template sheets. (1 template has 2 rockets)

2. Pass out supplies for each group to share when creating their rockets
   - Construction paper
   - Scissors
   - Glue sticks
   - Markers
   - Pencils
   - Cardboard tubes

3. Instruct students to trace trace template pieces onto the color construction paper they want.
   - Cut out the traced materials.

4. Now have them place a cardboard tube on the color paper they want their body of the rocket to be.
   - Students will now draw lines edge to edge to of the cardboard tube to the ends of the paper.
   - Cut out the strip of color paper.

5. To make the nose of the ship, roll the opened edges of the cut out together so that the middle of the cut circle forms a point at its end.

6. For the body, glue or tape the strip of color paper from before, onto the cardboard roll.

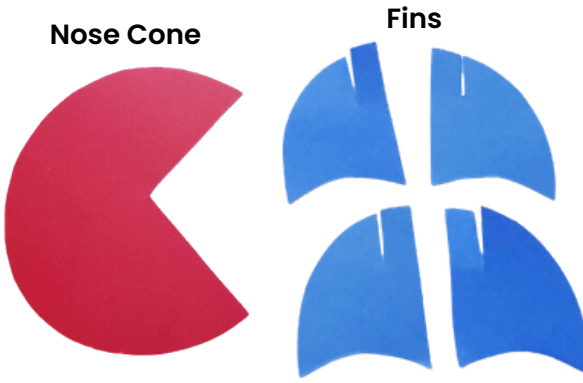
7. Cut 4 evenly spaced vertical slits at the bottom of the carboard tube.

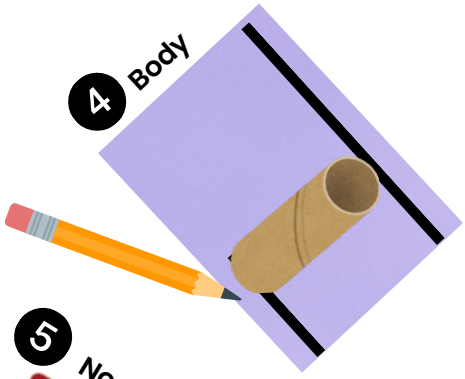
8. Cut a vertical slit in each fin template you cut out to match the cardboard tube cuts.

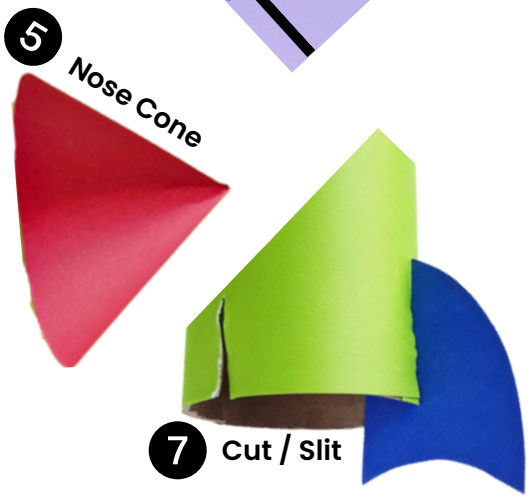
9. Slide the fins on and use tape or glue for durability.

10. Lastly, attach the nose cone to the top of the tube and glue or tape it to help keep it in place.

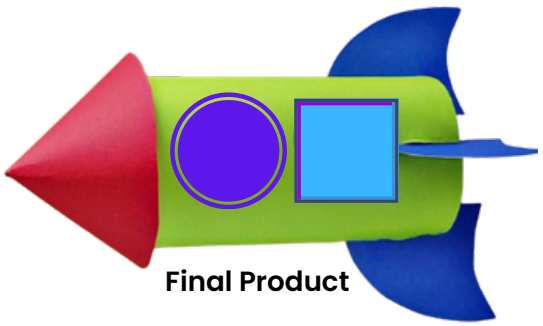
11. Allow students to decorate beyond this with words, shapes, or doodles!











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TAKE HOME ROCKETS

EXPLANATION 3-5 min

There is a ton of scientific planning and testing involved in rocket creation, from designing the intricate components to conducting rigorous tests to ensure safety and efficiency.

The process of rocket creation is a complex and fascinating journey. Engineers and scientists work tirelessly to push the boundaries of what is possible, constantly seeking innovation and improvement.

We have touched on the simplest parts of the rocket creation process, but every aspect is important.

REVIEW 3-5 min

Nose Cone: is the pointed front end of the rocket that helps reduce air resistance and streamline its movement through the air.

Body: holds the other rocket components that require important balancing acts.
Examples:
shock cord, recovery system, parachute string, wadding, centering rings, the engine block, motor mount tube, and the engine hook or an alternative engine retainer.
The important take away is that there is always a balancing act going on when creating a rocket, even just the weight of everything must be accounted for.

Fins: are attached to the body to help stabilize the rocket's flight path.

Engine: is the powerhouse of the rocket, providing the thrust needed to propel it into the sky.

Fuel Pod: carries the rocket fuel required to launch the rocket into space. The initial lift off is particularly important for the structuring of the rocket as too little or too much weight could impact the entire launch sequence.



Exit Ticket



Ask each student one of the following questions as they walk out the door.

- What is one important feature of the nose cone of a rocket?
  - Examples include pointed front end, reduces air resistance, helps streamline movement through the air
- What is the purpose of the rocket body?
  - Examples include holds rocket components, balances weight, supports parts like the recovery system and engine mount
- Why is balancing important when designing a rocket?
  - Examples include accounting for weight, affects launch sequence, helps the rocket fly properly
- What is the purpose of fins on a rocket?
  - Examples include stabilizes flight path, keeps rocket moving straight, improves control during flight

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TAKE HOME ROCKETS

ROCKET PARTS TEMPLATE





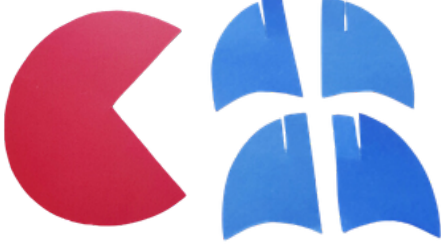
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TAKE HOME ROCKETS: STUDENT DIRECTIONS

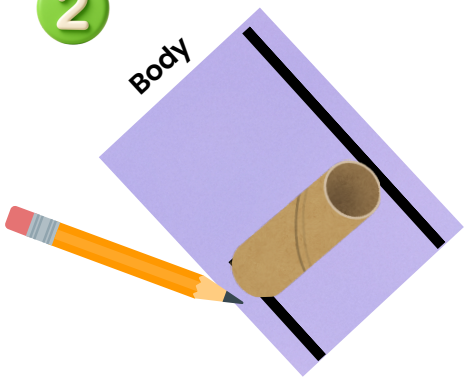
1

Nose Cone

Fins



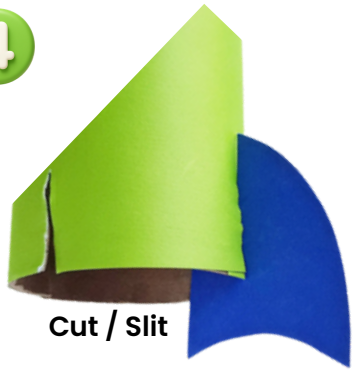
2



3



4



Cut / Slit

5



All 4 fins attached

6

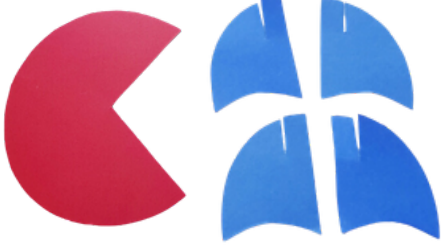


TAKE HOME ROCKETS: STUDENT DIRECTIONS

1

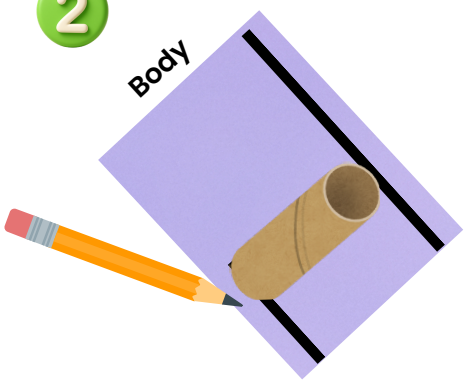
Nose Cone

Fins



2

Body



3

Nose Cone



4



Cut / Slit

5



All 4 fins attached

6

