

Drag Device Challenge



You are part of the NASA engineering team that will land a rover on Mars. You will need to design a way to slow the rover down so that it can land on Mars without causing any damage to the rover.

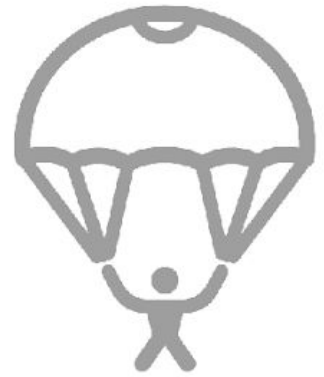
YOUR MISSION

Design a parachute to safely land a rover on Mars.

Team Member Names

Engineering Team Name

Drag Device Challenge



Build a drag device to keep your rover inside the cup and maximize time to impact.

CONSTRAINTS

1. Rover must remain inside cup after impact.
2. Do not place anything inside cup.
3. Do not damage the cup during design and testing.
4. Keep a 6 inch clearance above the cup.
5. Drop test is measured from the bottom of the cup.

Keep a
6 inch
clearance
above cup



No damaging cup or
placing anything inside.

Drag Device Challenge



Build a drag device to keep your rover inside the cup and maximize time to impact.

Response to videos

1. What two forces are acting on the parachute as it falls?
2. If you were designing a parachute, what materials or design changes could help it fall more slowly?

Name: _____

1



Identify the Problem

Design a parachute to keep your rover inside the cup and maximize time to impact.

Constraints

- Rover must remain inside cup after impact.
- Do not place anything inside cup.
- Keep a 6 inch clearance above the cup.
- Drop test is measured from the bottom of the cup

2

Materials

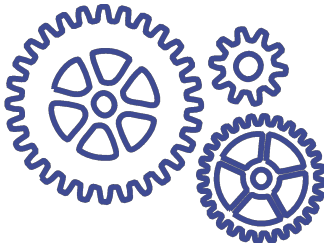
- | | |
|----------------|------------------|
| • Tissue paper | • Masking tape |
| • Dixie cups | • Scotch tape |
| • String | • Ping Pong ball |
| • Cardstock | • Trash bags |

Brainstorm

How will you maximize drag forces to slow down your parachute/rover?



3



Design

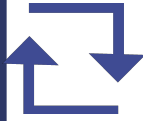
Sketch your design idea below.

4

Build



5



Test

Time to test your parachute! For each trial, complete the table below.

Trial	Time to Impact	Stays in cup?	Write or Draw Improvement Ideas
1		Yes / No	
2		Yes / No	
3		Yes / No	

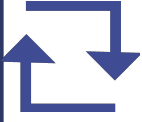
6

Reflect & Share

1. What did you learn from this challenge?
2. How can your parachute be improved?



5



Redesign Test

Time to test your *redesigned* parachute! For each trial, complete the table below.

Trial	Time to Impact	Stays in cup?
1		Yes / No
2		Yes / No
3		Yes / No

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Reflect & Share

1. What did you learn from this challenge?



Reflection

Think back to the engineering design process that you used to complete the Parachute Challenge. With your teammates, discuss the challenges you faced and answer the questions below. Your teacher may ask you to present your results to the class.



1. Describe your device and how you decided on this design.
2. What was the greatest challenge completing this activity?
3. If you had more time or more materials, what would you change?
4. Which device had the longest time to impact? Why?
5. What was the most enjoyable part of the challenge? Why?

Record a video with your team answering and discussing these questions. Add the video to your Keynote Presentation.

Share Your Solution



Create a KeyNote Presentation

Parameters:

1. At least **6 slides**
2. **Title page** with names of group members
3. **Transition** between slides
4. One slide must have a **data chart**
5. **and findings**
6. Insert a **video** on a slide
7. Insert at least **3 images** within the slide presentation that show different stages of the **building process** and **testing process**.