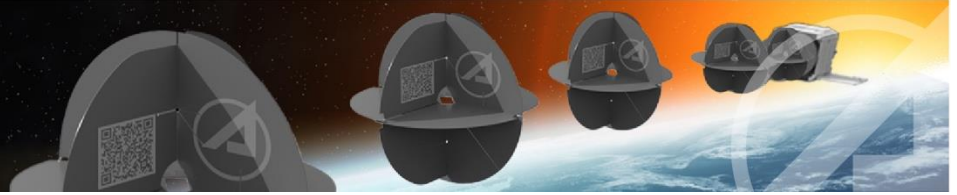


# Falling Stars

## Student Handout



Name		Date	
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**Directions:** Students read the prompts and answer in complete sentences in the box to the right.

### Part 1: What is the lifecycle of a satellite?

#### Section A: Thinking about the sky

1. What do you **think** you see when you look up at the sky during the **day**?
2. What do you **think** you see when you look up at the sky during the **night**?
3. Draw a picture of what you think the **sky** looks like at **night**.

#### Section B: Thinking about orbits

4. What do you **notice** or **observe** about The Aerospace Corporation message?
5. What do you **think** it means to **orbit** another object?
6. How many **objects** do you **think** are up in **orbit** around the **Earth** at the same time?

7. How many <b>different</b> types of <b>satellites</b> are there?	
8. What do the <b>first three satellites do</b> ?	
9. What does the <b>fourth satellite do</b> ?	
<b>Section C: Satellites Everywhere</b>	
10. What do you <b>notice</b> about the <b>satellites</b> ?	
11. How <b>long</b> do you <b>think</b> these <b>satellites</b> and objects have <b>orbited</b> Earth?	
12. How <b>small</b> do you <b>think</b> the smallest <b>satellite</b> is	
13. Why do you <b>think</b> there are so <b>many satellites</b> ?	
14. Try to click on a <b>satellite</b> (dot), what happens when you <b>click</b> it and what do you <b>notice</b> about it?	
<b>Lifecycle of a Satellite</b>	
15. <b>Develop/Build</b> (What are we making)	
16. <b>Launch</b> (How will we get there)	

17. <b>On Orbit Ops</b> (Why is this data important)	
18. <b>Decommissioning/Re-entry</b> (Where will it go)	
<b>Section D: The Falling Stars</b>	
19. Draw below your idea of what you <b>think</b> your Falling Star design would look like.	
20. What did you learn today about orbits and satellites?	

Word	Definition	Image	Description in Your Own Words
Satellite	A satellite is a small object that orbits, or revolves around, a larger object in space. They can be natural or made by people. Satellites made by people are sent into space to gather information.		
Orbit	The path an object takes in space when it goes around a star, a planet, or a moon.		
Speed	How fast something moves; how much time it takes an object to cover a distance.		

Descent	To come or go down from a higher place to a lower one.		
Re-entry	An object from space entering the atmosphere of a planet.		
Space probe	A spacecraft (example: "falling star") sent out to collect science information. They do not have astronauts and some can send data back to earth.		

**Part 2: How do scientists and engineers make probes?**

Section E: The Aerospace Corporation is a Team	
1. What are your favorite teams or times you were on a team and why?	
Section F: Making the Falling Star	
2. After the teacher tells you to drop your space probe (example: falling star). What did you observe about your probe that was <b>similar</b> and what was <b>different</b> compared to your classmates?	
3. What did you notice about <b>how</b> the space probe (example: falling star) <b>fell</b> ?	
4. Write down your observations about what happened when the class dropped the space probes (example: falling stars) at different heights.	

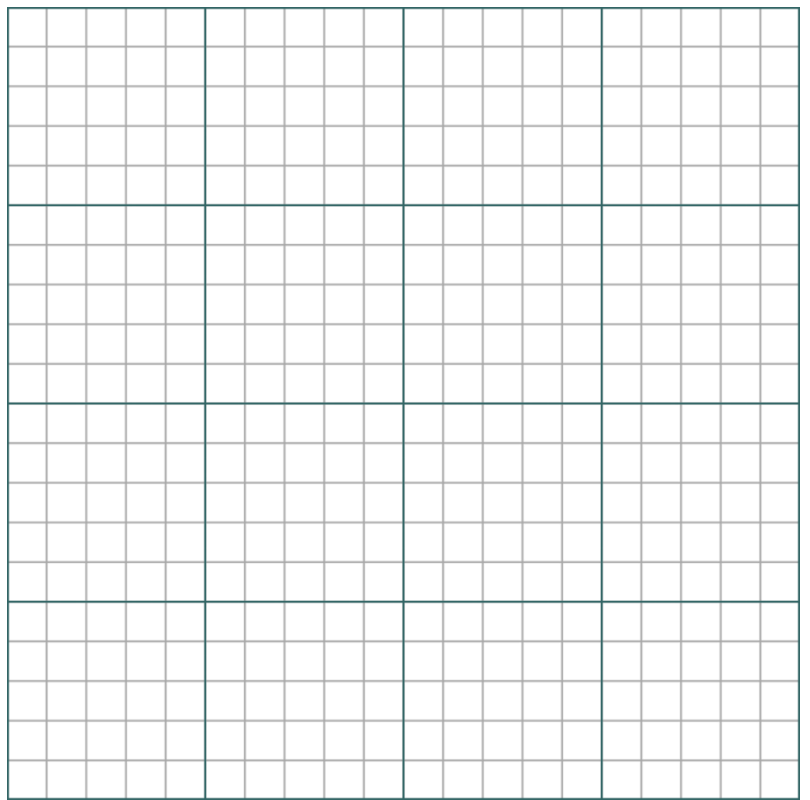
<b>Section G: Falling Stars Team</b>	
5. Who did you work with and who did you need to talk to?	
6. Did someone in the class have an idea that you tried?	
7. What things can change how a space probe (example: falling star) returns and re-enters Earth's atmosphere?	
8. What did you learn about working together?	
9. What was it like working on your own?	
10. How can this help you work on creating a new design?	
11. Which part of the Life Cycle of a Satellite do you like best so far and why?	

**Part 3: How does drag affect a satellite?**

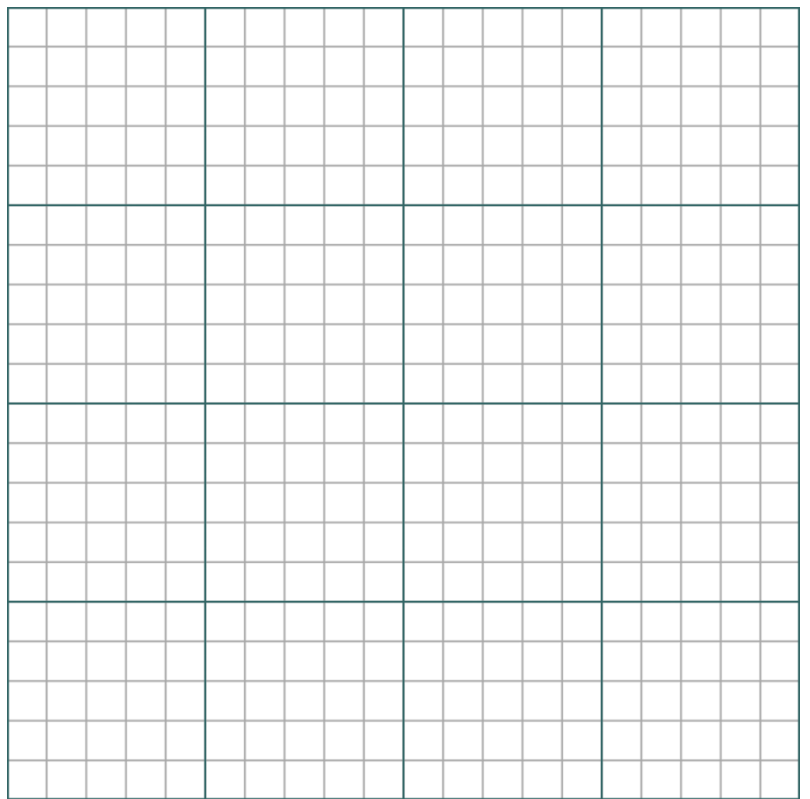
<b>Section H: Falling Stars Engineered</b>	
1. How can you make it fall slowly?	
2. How can you control how it falls?	
3. Place an "x" by your job role	<input type="checkbox"/> Lead Scientist: records all of the groups' ideas and presents the ideas to the class <input type="checkbox"/> Lead Engineer: collects the materials for the

	experiments based on the team goal
4. Our team name is:	
5. Place an "x" by your team's goal	<input type="checkbox"/> Goal #1 Falling Star falls the <b>slowest speed</b> (the greatest amount of drag, the longest time in seconds in air) <input type="checkbox"/> Goal #2 Falling Star falls (descent to re-entry) to a <b>specific target location</b> on the "x" in the classroom
6. Draw out your initial brainstorm for your team.	
7. Write a short commercial about why your team's space probe (falling star) is the best.	
<b>Section I: Falling Stars Test Time</b>	
8. What variable did you change?	
9. What was your drop time(s)?	

10. Graph for goal 1



11. Graph for goal 2



## Section J: Falling Stars Engineered

12. What variable changed how fast the space probe (falling star) fell?	
13. What new ideas do you have about satellites?	
14. How can this experiment be similar to the real design and partnership of scientists and engineers working together like they do in The Aerospace Corporation?	
15. Is there any evidence for your ideas working in the experiment?	
16. What were the ideas that gave us the best results?	
17. Write a reflection: how do you use space on a daily basis?	
18. How do teams work together to put objects into space?	
19. In your own words describe what you did for each part of the Life Cycle of a Satellite or Falling Star (develop/build, launch, on orbit ops, re-entry).	