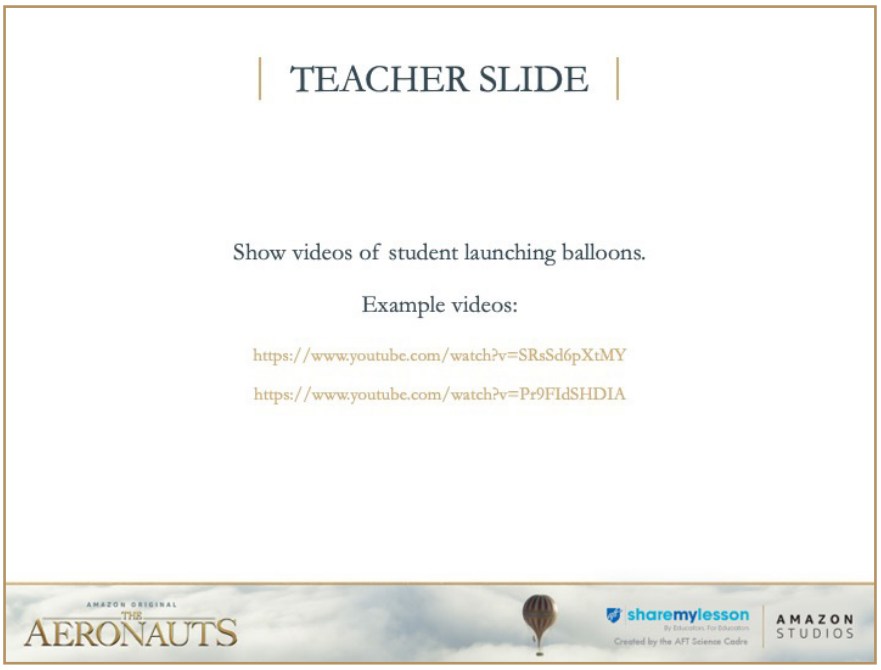
POWER POINT GUIDE: BALLOON CHALLENGE

SLIDE 1


TEACHER SLIDE
Show videos of student launching balloons.
Example videos:
https://www.youtube.com/watch?v=SRsSd6pXtMY
https://www.youtube.com/watch?v=Pr9FIdSHDIA
AMAZON ORIGINAL
THE AERONAUTS
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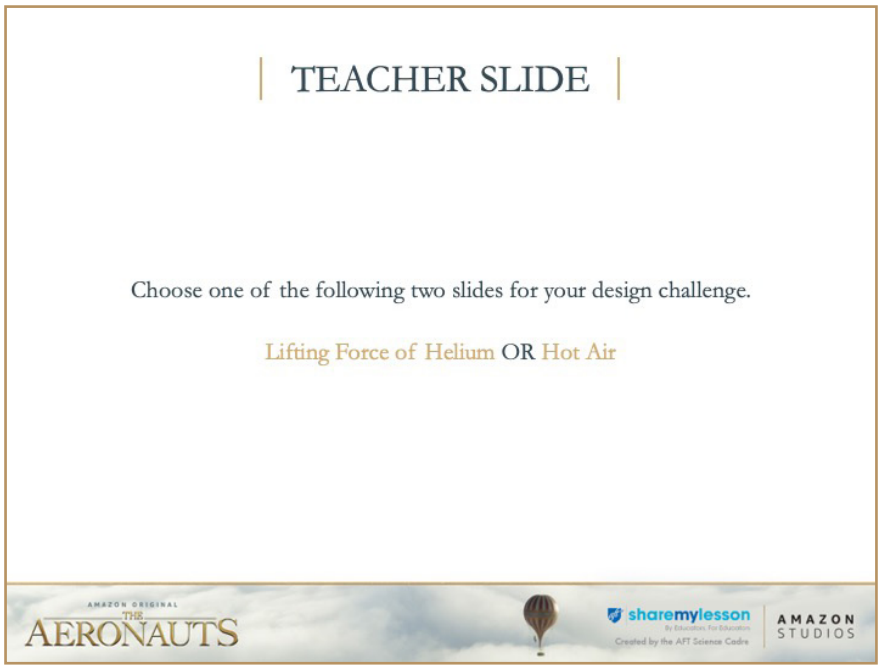
AMAZON STUDIOS


TEACHER SLIDE
Choose one of the following two slides for your design challenge.
Lifting Force of Helium OR Hot Air
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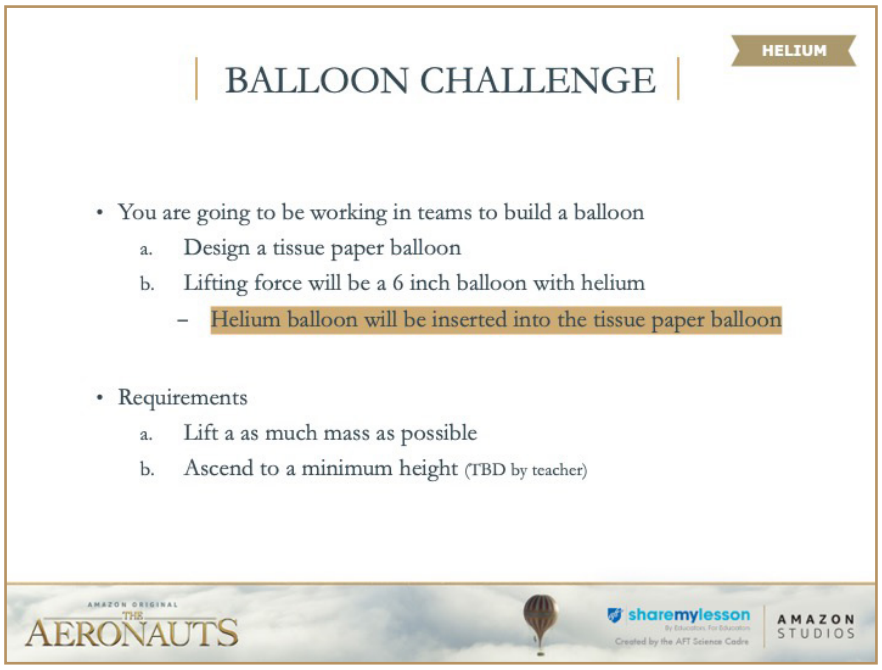
HELIUM
BALLOON CHALLENGE
• You are going to be working in teams to build a balloon
a. Design a tissue paper balloon
b. Lifting force will be a 6 inch balloon with helium
– Helium balloon will be inserted into the tissue paper balloon
• Requirements
a. Lift a as much mass as possible
b. Ascend to a minimum height (TBD by teacher)
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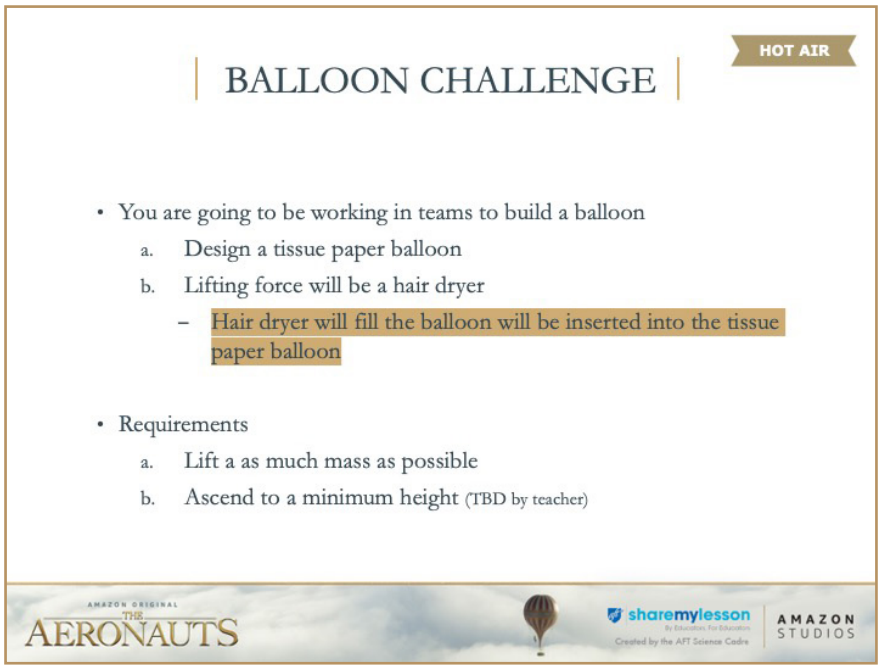
HOT AIR
BALLOON CHALLENGE
• You are going to be working in teams to build a balloon
a. Design a tissue paper balloon
b. Lifting force will be a hair dryer
– Hair dryer will fill the balloon will be inserted into the tissue paper balloon
• Requirements
a. Lift a as much mass as possible
b. Ascend to a minimum height (TBD by teacher)
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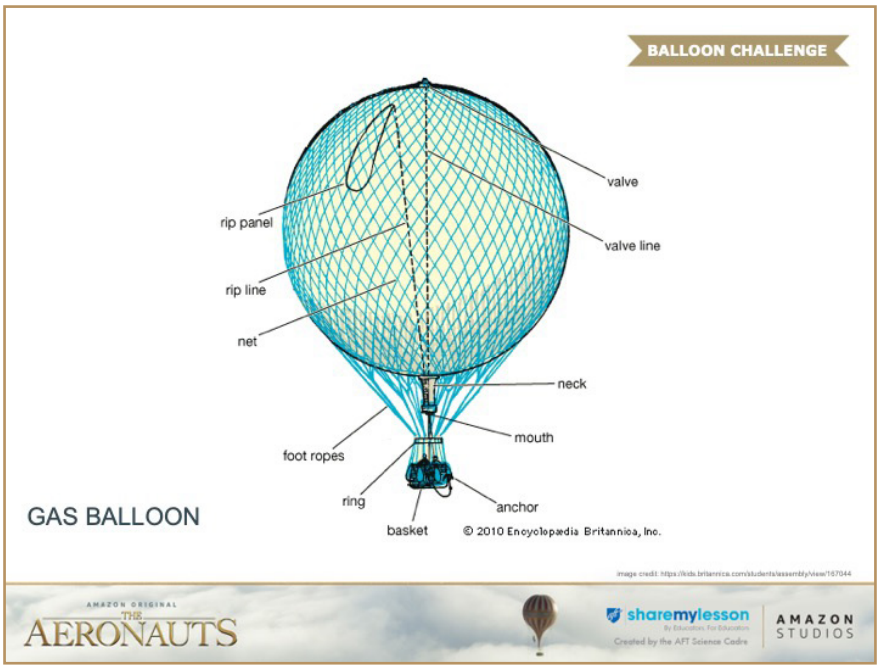
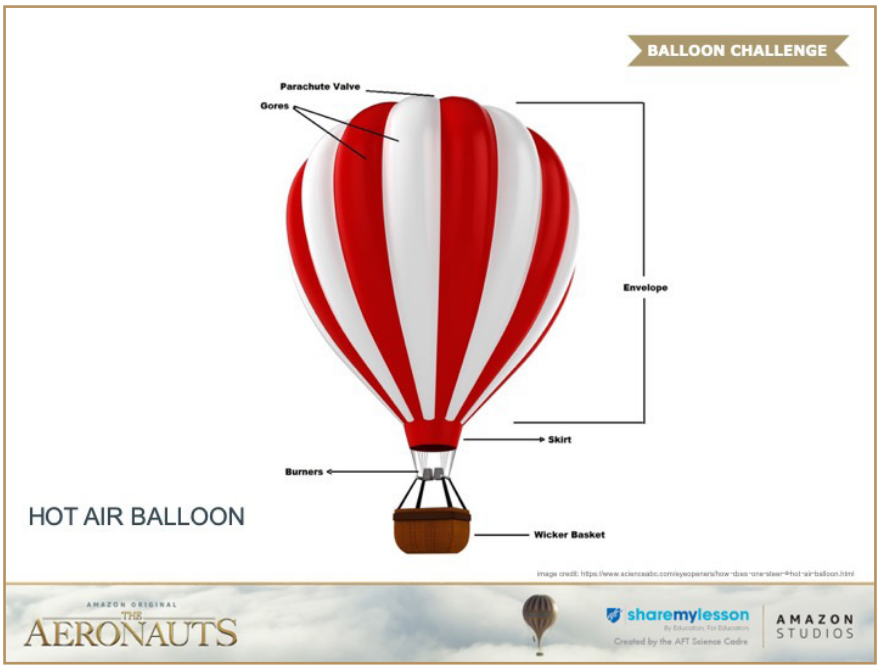


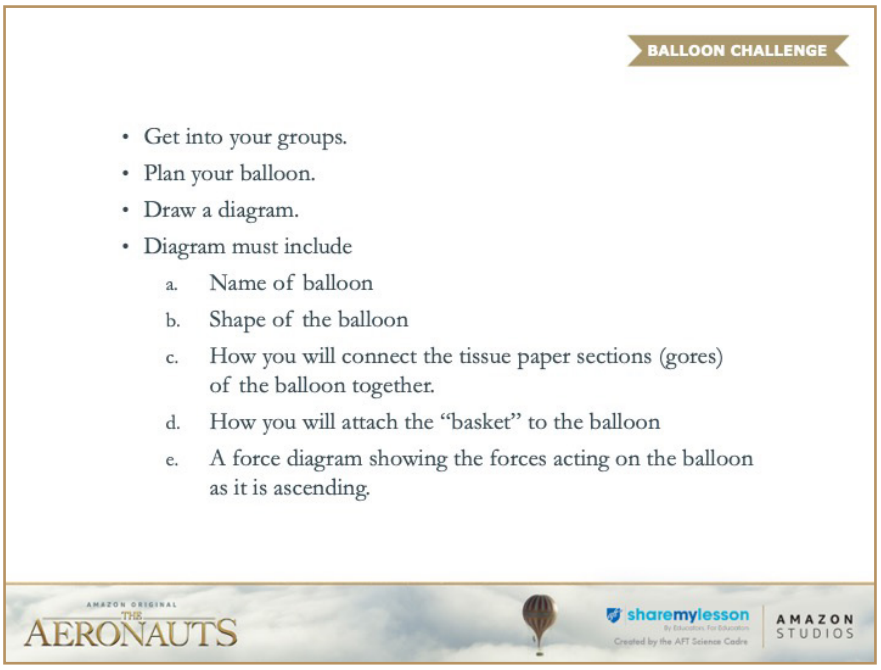
Use this slide to introduce students to the parts of a balloon. This is a gas balloon. We will not need a valve line or a rip line because there will not be a pilot to operate the valve.

The rip panel and rip line were used by the balloon pilot when the balloon landed to rapidly release the air.[1]

http://www.madehow.com/Volume-3/Hot-Air-Balloon.html



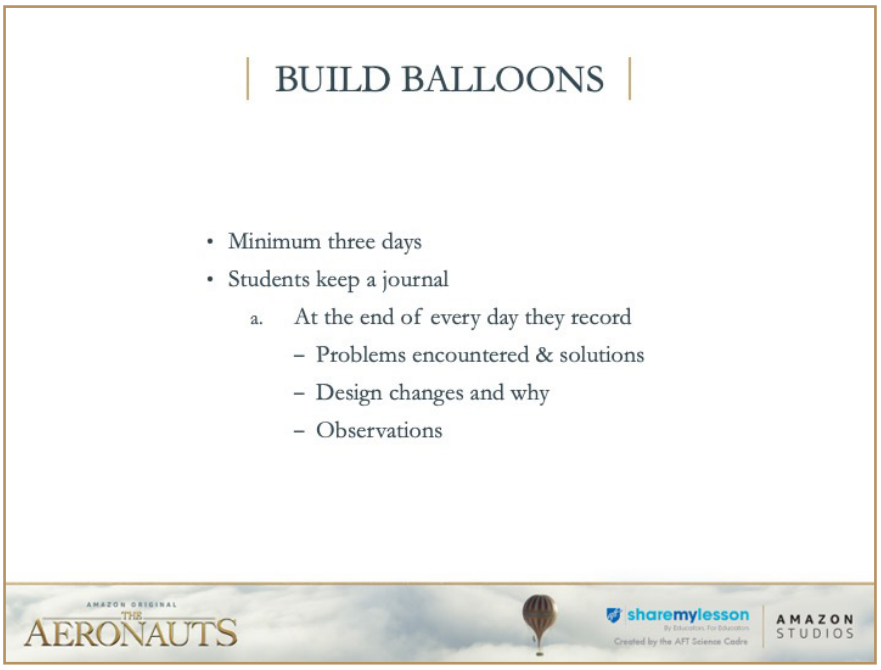
Use this slide to introduce students to the parts of a balloon. This is a hot air balloon.



Assign or allow students to form cooperative learning groups of 3–4 students.

Students should draw their design and force diagram on poster paper or white boards. Each group will present their ideas to the class.

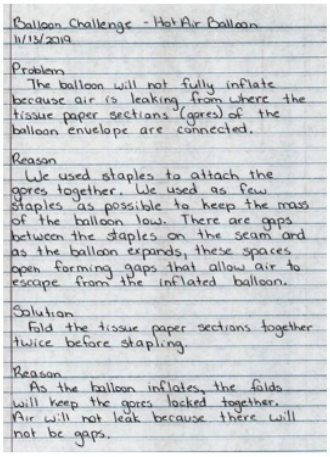
As each group presents their designs the classmates should ask questions, make constructive suggestions and give compliments.



Teachers should edit the time frame to meet their needs.

Students should be given time at the end of each period to make an entry in their science journal.

SAMPLE JOURNAL ENTRY



Balloon Challenge - Hot Air Balloon
11/13/2019

Problem
The balloon will not fully inflate because air is leaking from where the tissue paper sections (gores) of the balloon envelope are connected.

Reason
We used staples to attach the gores together. We used as few staples as possible to keep the mass of the balloon low. There are gaps between the staples on the seam and as the balloon expands, these spaces open forming gaps that allow air to escape from the inflated balloon.

Solution
Fold the tissue paper sections together twice before stapling.

Reason
As the balloon inflates, the folds will keep the gores locked together. Air will not leak because there will not be gaps.

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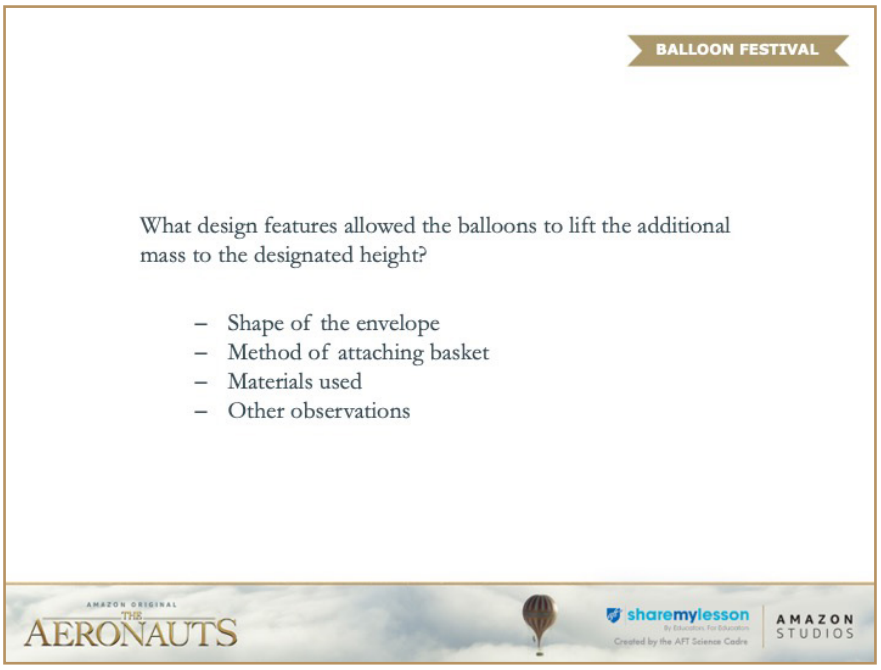
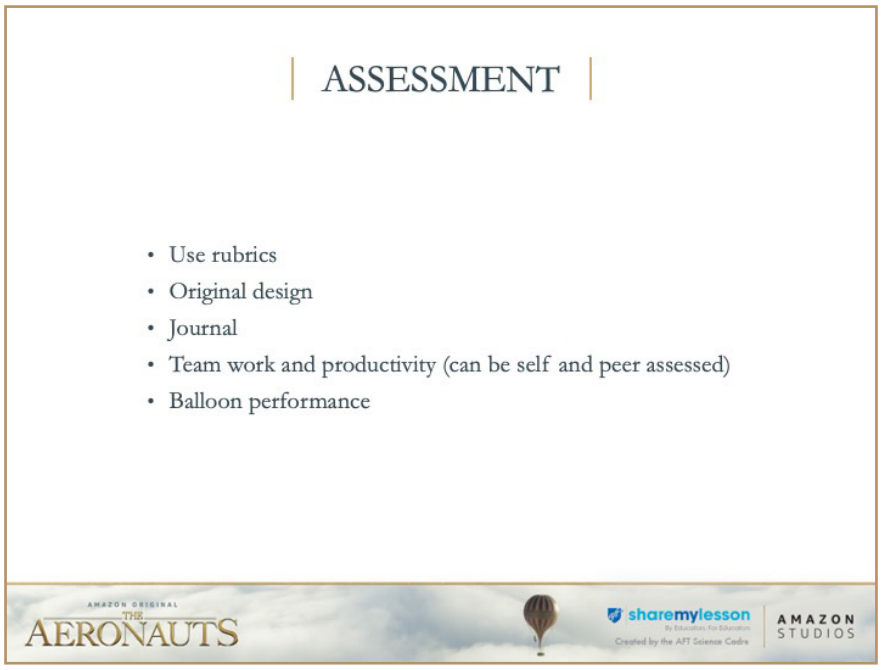
AMAZON STUDIOS

BALLOON FESTIVAL

- Each group presents their balloon design
- Tell the name of the balloon
- Tell the features, including the mass your balloon will be able to lift.
- Science behind the balloon
    a. Explain why balloon will float
    b. Explain the forces acting on the balloon using a force diagram.
- Answer questions
- Launch balloon
- Record (if possible).



After all the balloons have been launched, have a class discussion about what features were incorporated into the most successful designs.


ASSESSMENT
• Use rubrics
• Original design
• Journal
• Team work and productivity (can be self and peer assessed)
• Balloon performance
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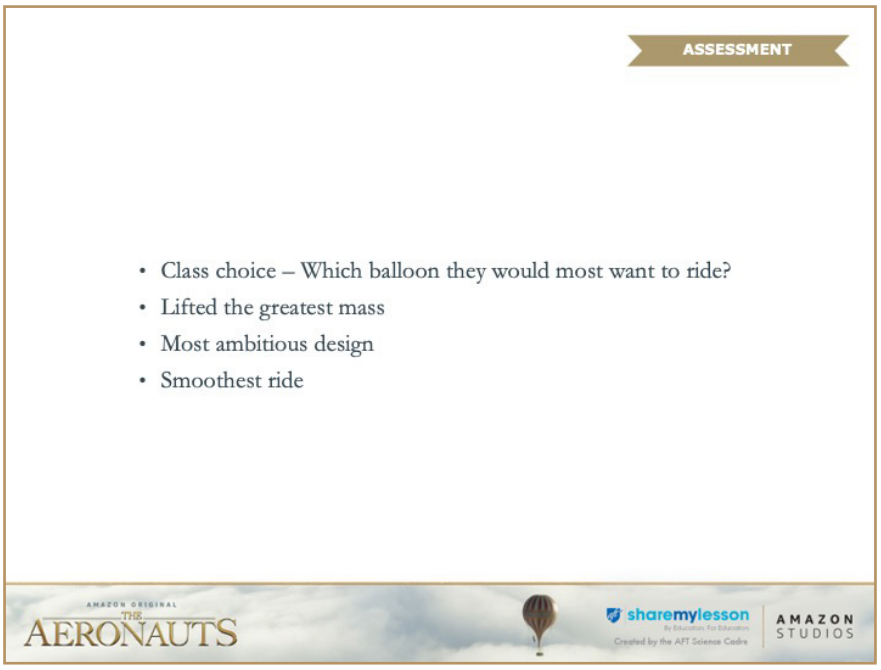

At the balloon festival, present awards to the following groups of students.