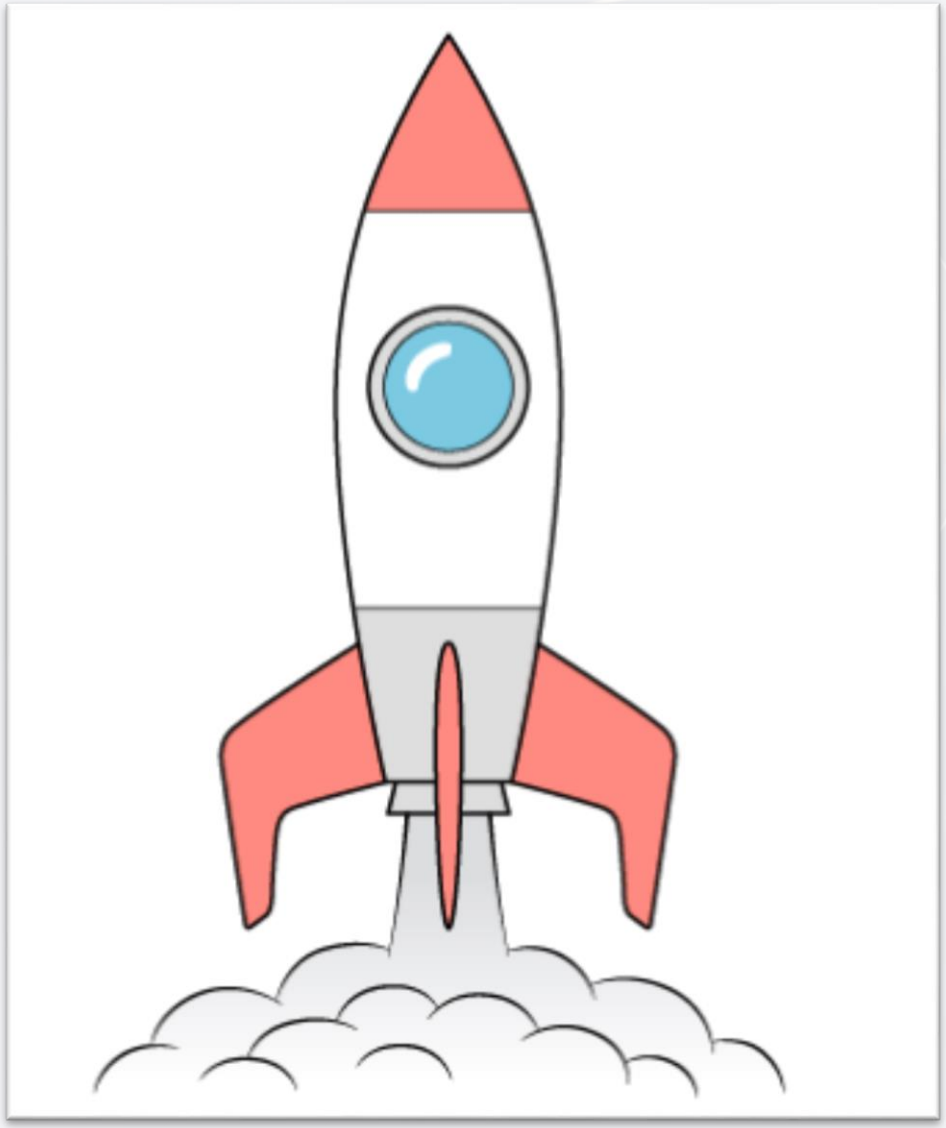
The Space Race: It's Rocket Science

W.A.L.T: explore how shape effects how well a rocket travels

Draw a picture of what you think of when I say 'rocket' to you. Label the most important parts of your drawing.
Compare it to your partner's!

When you drew your rocket you probably drew something like this. You probably had a pointy top on it. You probably had a long, thin main body of the rocket and you probably had some sort of fins at the bottom of the rocket.



What do rockets try to do?

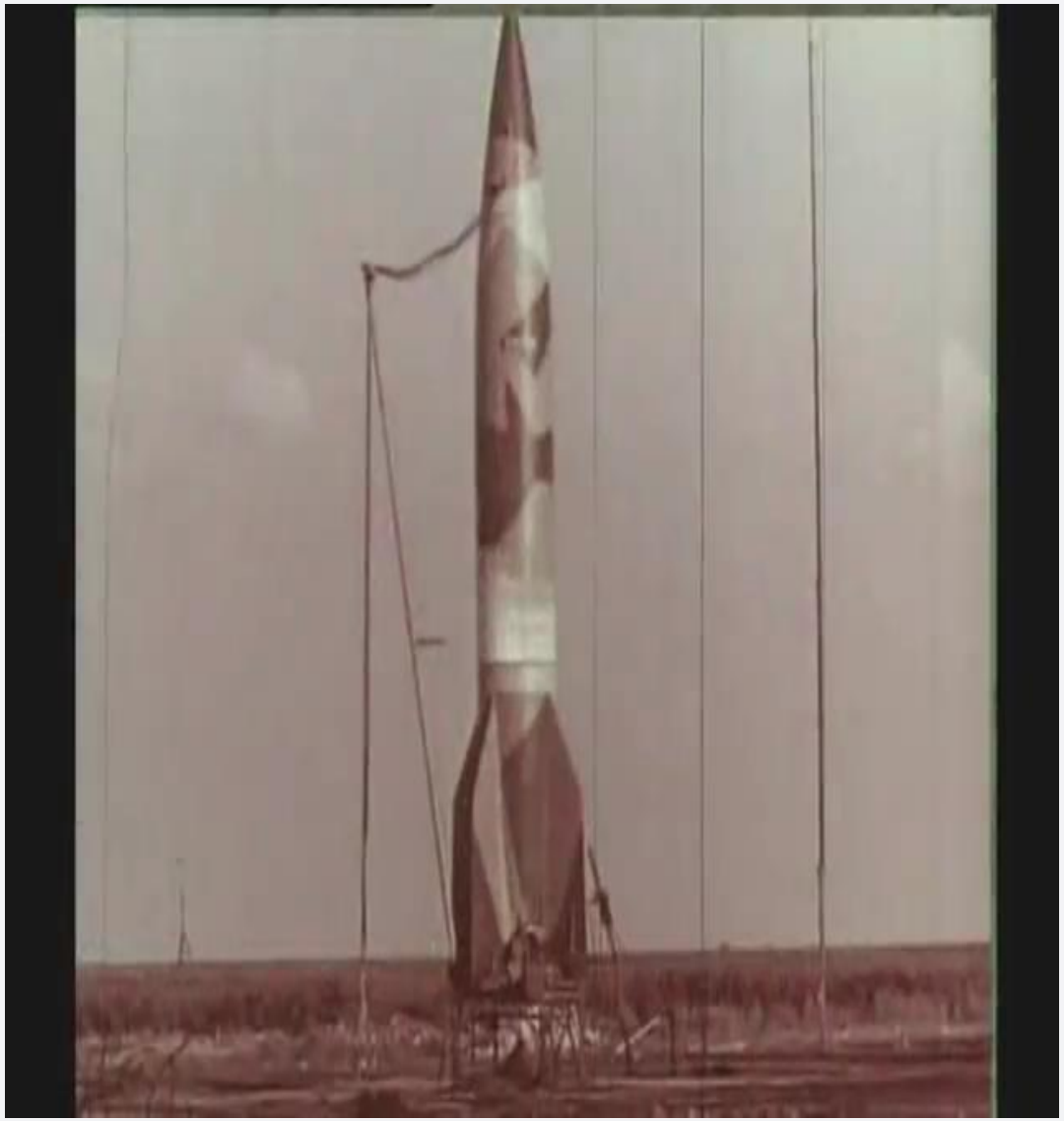
Think, Pair, Share.

Everything on Earth, including us, is held down by an invisible force called gravity. Without gravity we would all float off into space! A very famous scientist called Isaac Newton discovered gravity when an apple fell on his head!

We can try to break free of the Earth's gravity by using our legs to launch us into the air when we jump. But we simply don't have enough push in our legs to beat earth's powerful gravity. To reach space, we need much more energy to break free from Earth's gravity.

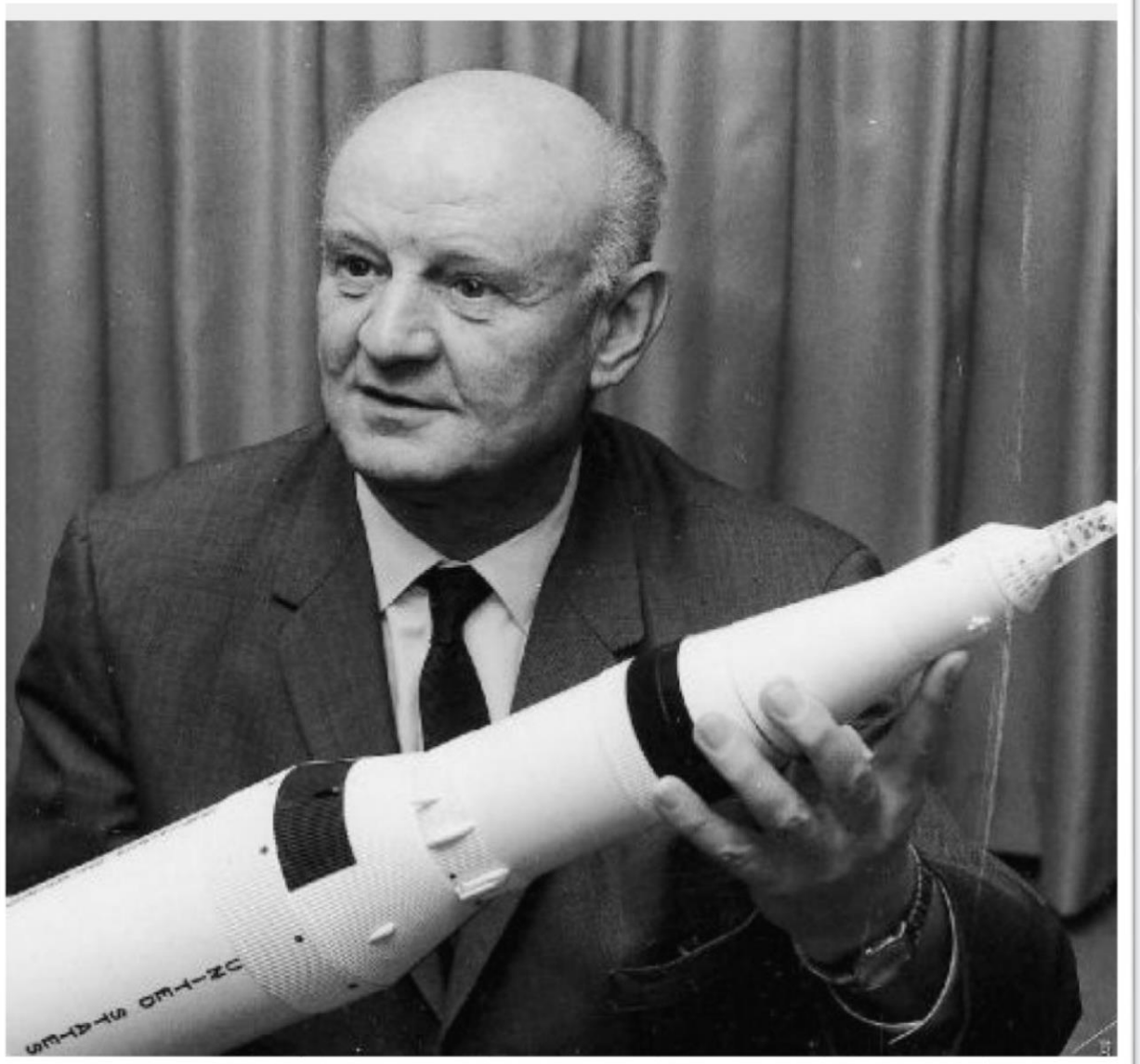
Rockets have been around for a very long time. They were first invented in China more than 800 years ago. You might recognise the design of the first rockets. They were cardboard tubes filled with gunpowder

What do they remind you of?



The only problem with using gunpowder was that it wasn't quite powerful enough to push rockets out of Earth's gravity field. During the Second World War, Nazi scientists started to experiment with different fuels to build bigger and more powerful rockets. They designed the V2 rocket to be launched at cities like London.

After WW2, many German scientists went to work in the USA or in the Soviet Union. They helped build bigger and more powerful rockets that could be launched into space instead of at cities. The shape and design of these rockets was crucial to their success.



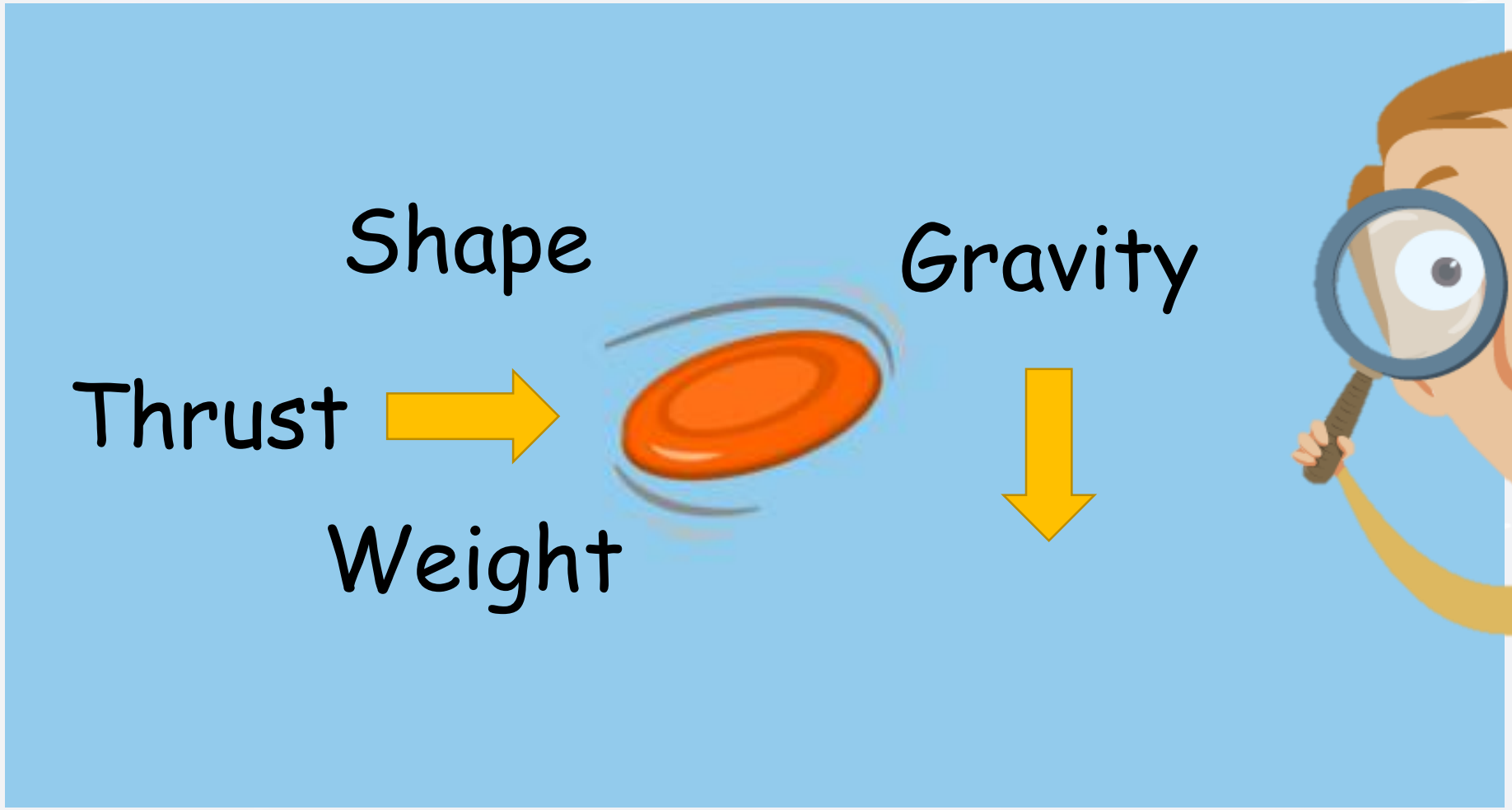
Why does a Frisbee fly so far?

I think it flies so far because of it's weight

I think it flies so far because of it's shape

I think it flies so far because…

A lot of forces are acting on that Frisbee!



Gravity wants to make sure that everything is pulled to the ground. We need to use a lot of science to beat gravity in this battle. One invention that is very good at staying in the air is the airplane! The shape of planes help them stay in the air for longer.

What shape of airplane do you think could beat gravity for the longest?

Think, Pair, Share.

Activity Time

It's time to design some paper airplanes. Remember to think about weight, shape and thrust when you are designing your airplanes. We will test them on the firing range when they are ready!

So what did you learn about weight, shape and thrust from your paper airplane experiments?

Think, Pair, Share.

The rocket scientists who worked on the NASA and USSR space programmes learned exactly the same way as you did. They experimented with different rocket designs to see which shapes would travel best through space.

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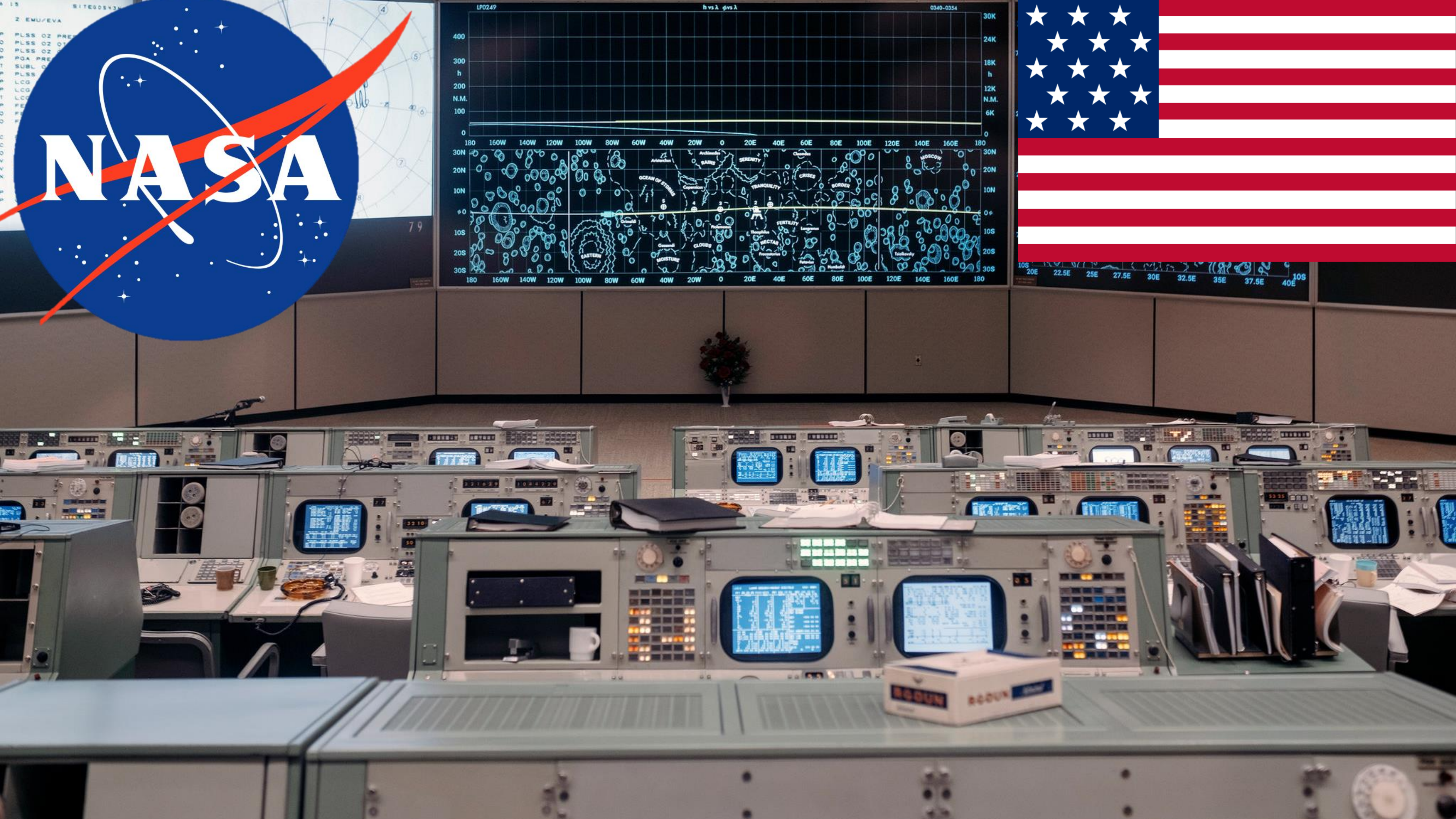
Activity Time

It's time to head back in time. You're going to need to bring all your knowledge of gravity and how to beat it with good design.

Are you ready?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TOP SECRET BRIEFING

DESIGN AND MAKE A ROCKET THAT TRAVELS THE FURTHEST DISTANCE WHEN LAUNCHED

- YOU CAN ONLY USE THE MATERIALS PROVIDED.
- YOU CAN MAKE TWO DIFFERENT PROTOTYPES.
- YOU CAN CUT, STICK AND CHANGE THE SHAPE OF THE ROCKET.
- YOU MUST WORK AS A TEAM ON THIS CHALLENGE.