

Drop It Like It's Hot!



Lesson Leaders: Dylan Nikitas, Johnathan Gilliam, Phylicia Hunt, Mo Mohamed, and Cameron Scott





What do I want to do?



Elementary Education
PreK-6th Grade

Who am I?

Cameron Scott



I have a 2 year
old Husky who I
named after
Draco from
Harry Potter.





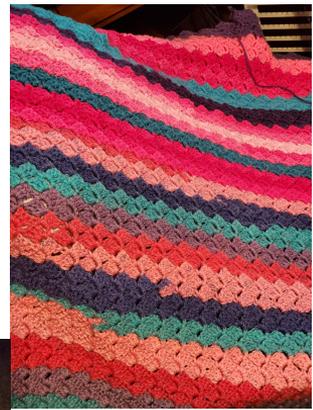
When I Grow Up!



I want t be a 1st grade teacher.

Who Am I?

Phylicia Hunt



I crochet blankets for the homeless and for people that live in nursing homes.

Mo Mohamed



Who am I?

Dylan Nikitas

I want to be a Mechanical engineer and if you couldn't tell, I am a cat person.

P.S. His name is Joey!





Who am I? John Gilliam



This is my project car. It's a 1983 Datsun 280zx.



I Rebuild and sell lawn mowers to make some extra money!

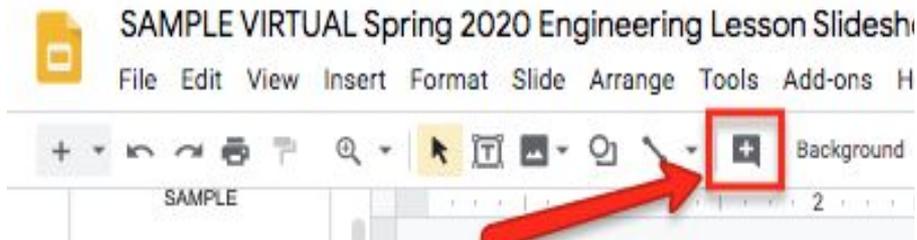
Who are you?

Leave a comment: Tell us your name and something you do for fun.

Use "Insert" → "Comment" (see image right)

or

Click the "+" in the toolbar (see below)



UAL Spring 2020 Engine

Insert Format Slide Arr

Image

Text box

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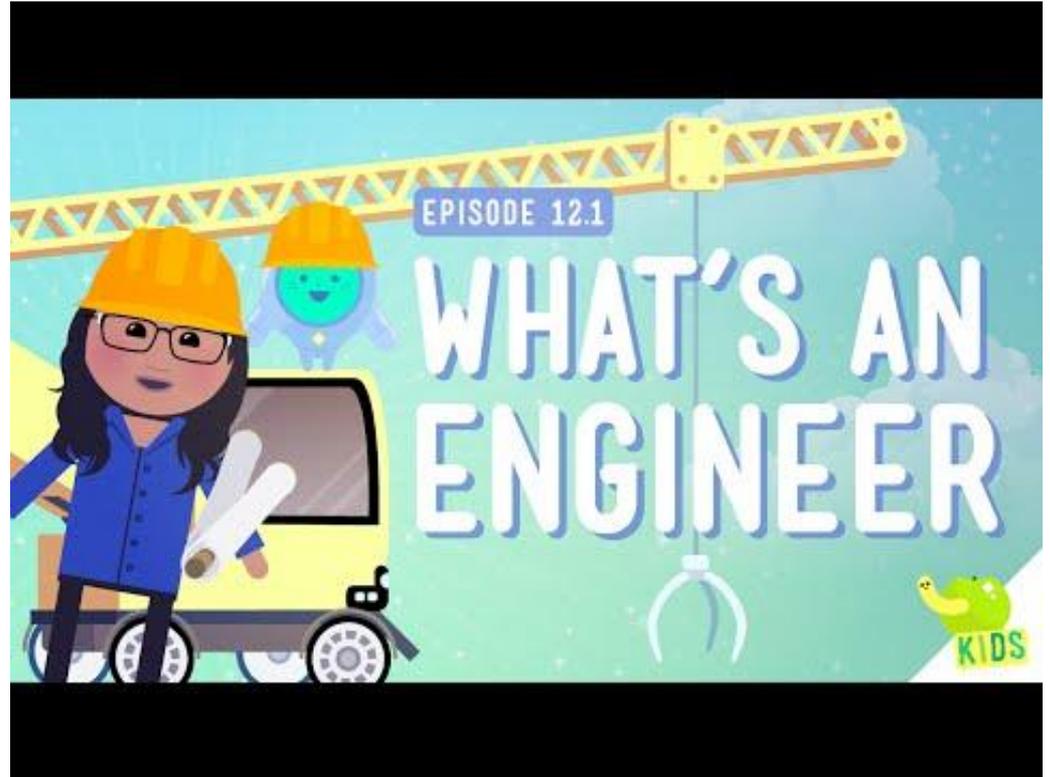
Link

Comment

⌘+Optic

What is Engineering?

Watch this video to learn exactly what an engineer is!



In order to succeed, Engineers fail ... a lot

Remember: Trial and error is how we learn and grow. This process is key to improving and developing new technology!



Meet an Engineer: Mary Jackson

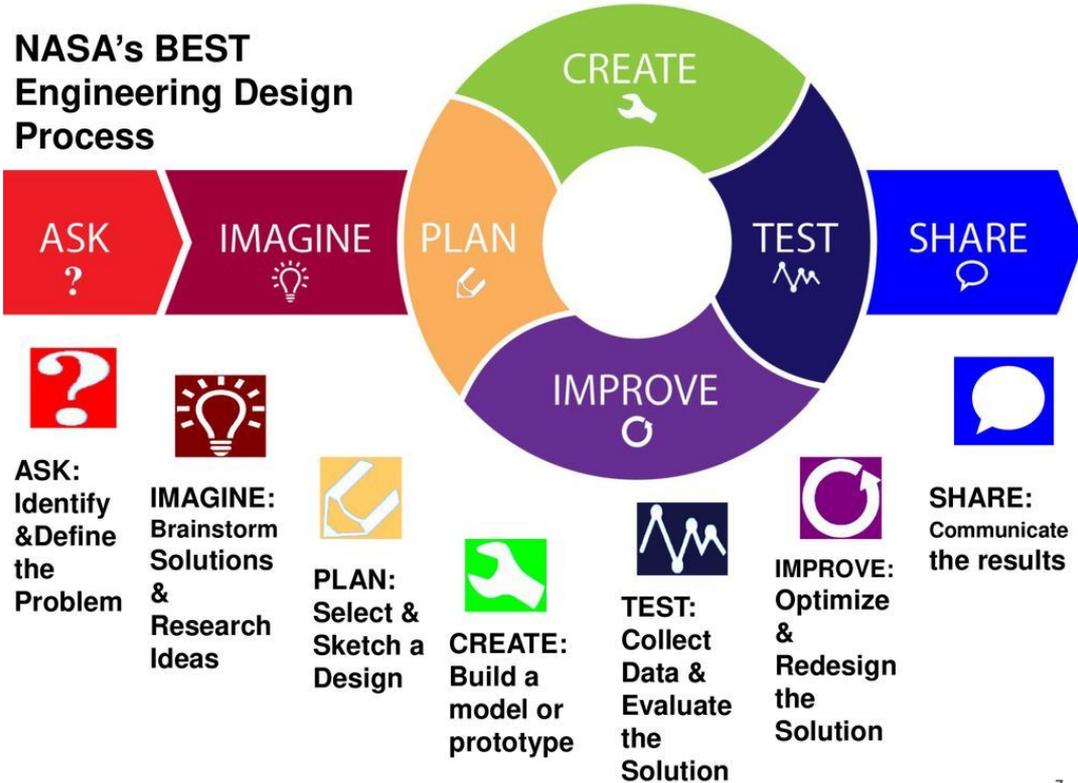


- Born and Raised in Hampton Virginia
- First African American woman to become an engineer at NASA
- Helped safely bring the first US astronaut back to earth



The Engineering Design Process (EDP)

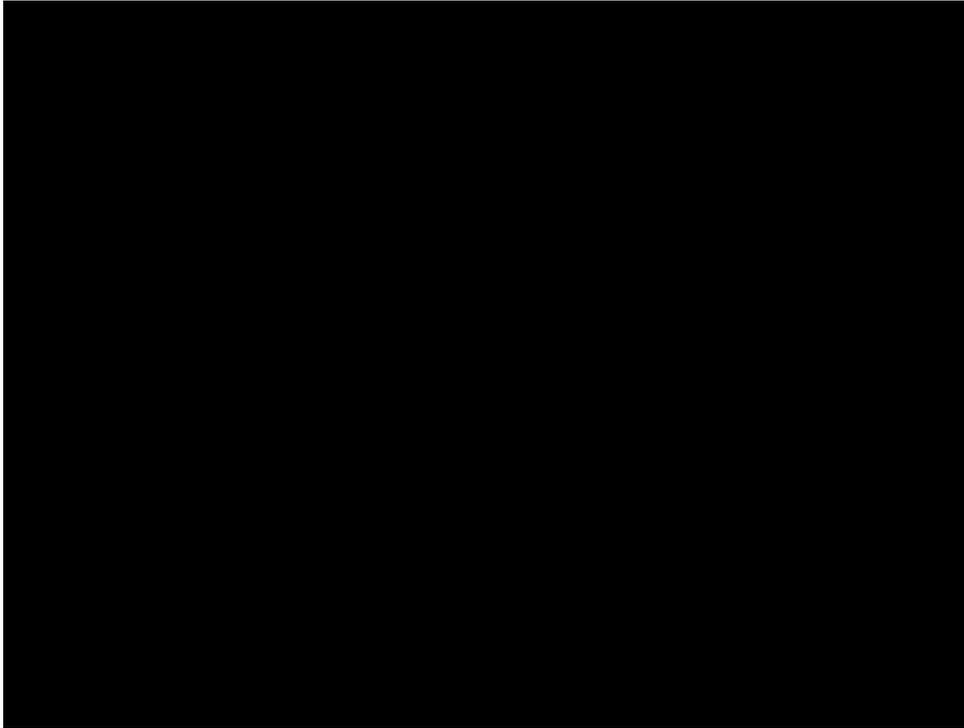
NASA's BEST
Engineering Design
Process



Watch this video where our Teacher Assistant, Josh, explains the EDP

Riddle Me This...

Watch this video and add a comment of your prediction!



Let's See if you were right...

Looks like the green army guy without a parachute fell the fastest. On the other hand, the green army guy who had a parachute fell the slowest.

Let's figure out why this happened in the next slide!

Tip: Expand the video to full screen to get a better view

Gravity and Air Resistance

Listen to this!

Watch this quick video in full screen to learn about gravity and air resistance



So how do these concepts apply to our experiment?

Airdrop Packages and Their Applications:



Watch this video to learn about airdrop packages!

Make a comment and tell us what you think about airdrop packages!

Airdrop Packages and Their Applications:

- Organizations such as Operation Airdrop and The World Food Programme provide aid and support to people in need
- Countries that experience natural disasters, such as hurricanes, or have military conflict are aided by these organizations



Today's Engineering Design Challenge...

The non-profit organization, Operation Airdrop, has contracted you engineers to brainstorm, design, build, and test an airdrop package prototype.

This package must deliver a sealed perishable food product to those affected by hurricane Florence. Using materials that you have at home, go through the engineering design process to build your prototype.

The challenge for today is to design and build a working airdrop prototype that protects a fragile package, such as crackers, spaghetti, or an egg. Put this package in a ziplock bag to avoid making a mess.



This is the recommended way to set up your package. Also add something heavy, such as steel balls or marbles, to make it more challenging!

IMAGINE

Brainstorm some ideas for you Airdrop

- What do you have at home that you can make an airdrop from?
- What household thing can you use to slow your airdrop down?
- Do you want your prototype to drop fast or slow?
- What can be used to make a safe airdrop landing?



Recommended Supplies

Note: Use anything around your house, it does not have to be these exact supplies.



String



Cardboard



Cups



Felt Sheet



Foam square



Plastic bag



Coffee stirrers



Pieces of Construction paper



Paper plates



Craft sticks



Pipe cleaners



Cotton balls



Tape

Here's are some other examples of supplies you can use!

Time to build your prototype!

Now take 30 minutes to build your prototype. Remember to be creative and have fun!



Testing Our Prototypes:



My package survived the test, but I noticed it was a little too heavy and caused it to lean

Test your prototype by dropping it at different heights. Start with a small drop, like at head height, and then move to a larger drop. Here are some videos and pictures of our prototypes being tested!



Here is my prototype. I decided to use a plastic bag and magnets and pasta in my package.



My package was fine but the egg fell out .



*If you use an egg, be careful for the mess!

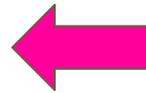
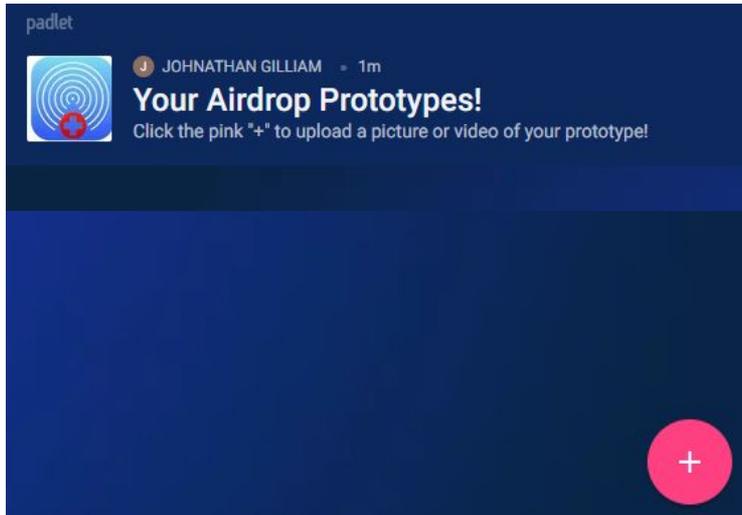


Here is my prototype before testing it. I used an egg inside of the cup. When I tested it, I was successful but my cup was tipped over.

Show us your designs being tested!



Take a picture or video of your prototype and how you tested it!



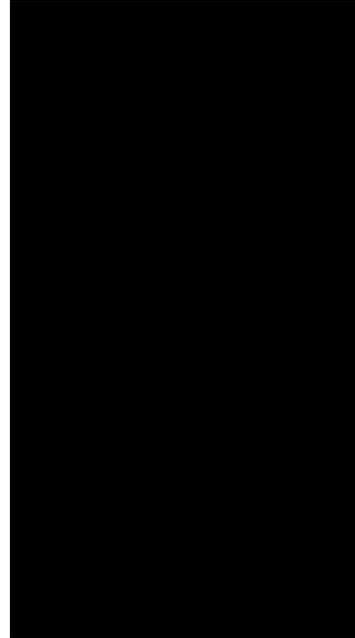
Click the image and the link that pops up, then click the PINK "+" to post

What happened?



My testing showed that my container for holding the package was too heavy, watch this video to see how I troubleshooted it!

To fix the issue of my cup being tipped I decided to add more to my design. You can see what I did to improve it by clicking my video!



My package made it through the testing process. Click the video to see what I did to improve my design.

Since my egg fell out of my cup the first time, I had to add something else to my prototype. Watch to see what I added!



Engineering/Science Concept Revisited

- What is Gravity, and how did it affect your airdrop?
- What is air resistance?
- Did you notice any air resistance when your prototype was dropped?

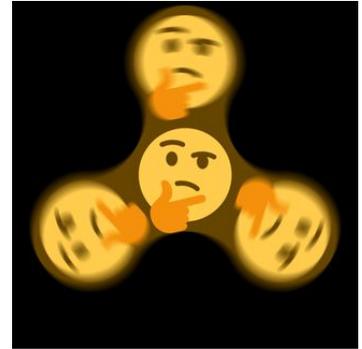


What can you do to improve your design?



PROBLEMS

Did your design cause you any problems?
Were the products in your package safe or
did they break?
Did you use a parachute?
One more question...



Think about a real life airdrop.
Many of the items that are being dropped from
the plane do have parachutes or something to
help the impact of the landing. Do you think you
need to add a parachute if you don't already
have one? What is something that can help your
items stay safe and not break?

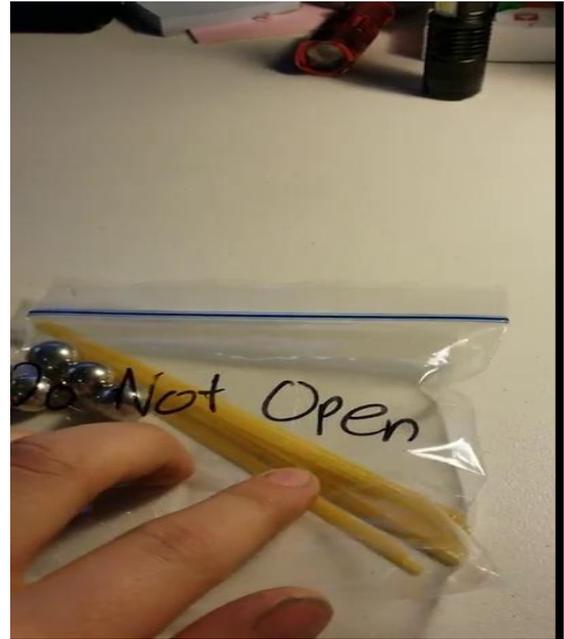
**Take a few minutes to redesign and test out your
new design!**

Make it more challenging!



If you thought your package deliverable to was too easy to protect, then look at what I did to make it more challenging!

**CHALLENGE
ACCEPTED**



Let's see what you know!



What do you know about AirDrops?

Let's see what you have learned!

* Required

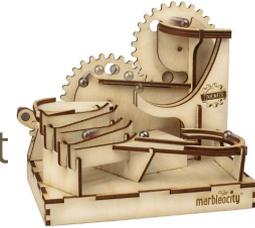
Click the link on
the image to
report what
you've learned!



Submit your engineered solution. Win a Prize!

You have completed the lesson from TEAM 13!

Click [HERE](#) to share your solution and enter our raffle & compet (make sure you have parental permission to enter!).



We will randomly select 10 winners from all entries. Everyone who enters is eligible to win! Choose from 5 different prizes.



We will also award a few prizes for really creative solutions!

**Entries must be posted by 11:59 pm
on May 31st!**



For more information...

- If you need help interacting with our slides, taking the quiz, or entering the contest, please contact [Ms. Noginova](#).
- If you have questions about the Ed+gineering projects that sponsored the development of this lesson, please contact [Dr. Kidd](#) and/or [Dr. Ringleb](#)
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