Learning Viscosity With Slime!

Kalyn Pierce
Tyler Gimbert
Roxanna Wood
Logan Rupert
Megan Hinson

Introductions

Meet the members of Team 1!

Below our group members have put together small introductions where we have shared our majors, career goals, and a little fun fact about ourselves!

We would also love to get to know more about you all! Leave a comment if you can and let us know what you wanna be when you grow up and maybe a little fun fact about you!

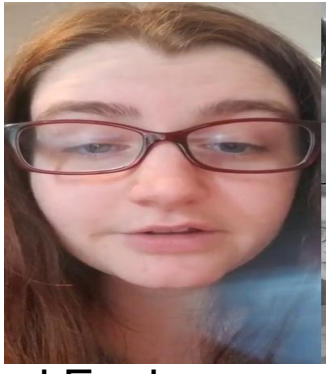
Introductions

My name is: **Tyler Gimbert**
I want to be a Mechanical Engineer & design machines.
I enjoy restoring vintage Automobiles.

Fun Fact!

I drive a 97 year old car.

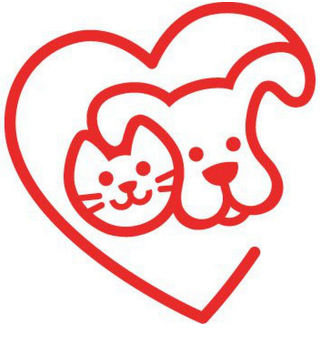
About Me

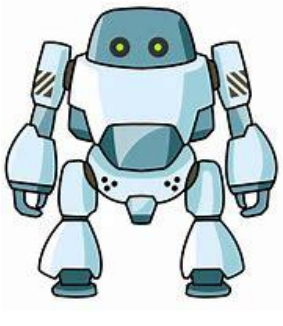


My name is Kalyn Pierce

I want to become a Mechanical Engineer and build Robots for NASA

I used to be on a FIRST Robotics team in high school
And I currently work at Petco!





Introductions

My name is Megan Hinson.
I want to become a Elementary school teacher.
One fun fact I like to four wheel in my free time.

Introductions

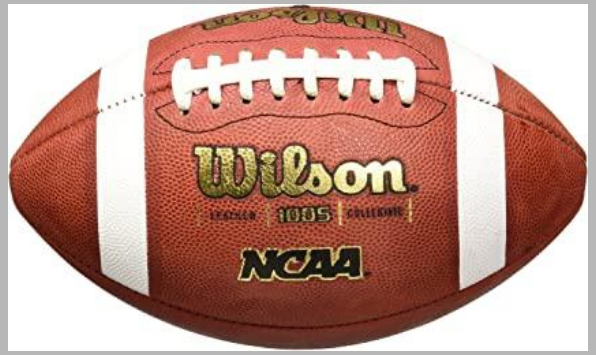
My name is Roxanna Wood.
I want to become an elementary school teacher.
Fun Fact: I love gardening and have a lot of plants in my room and backyard!

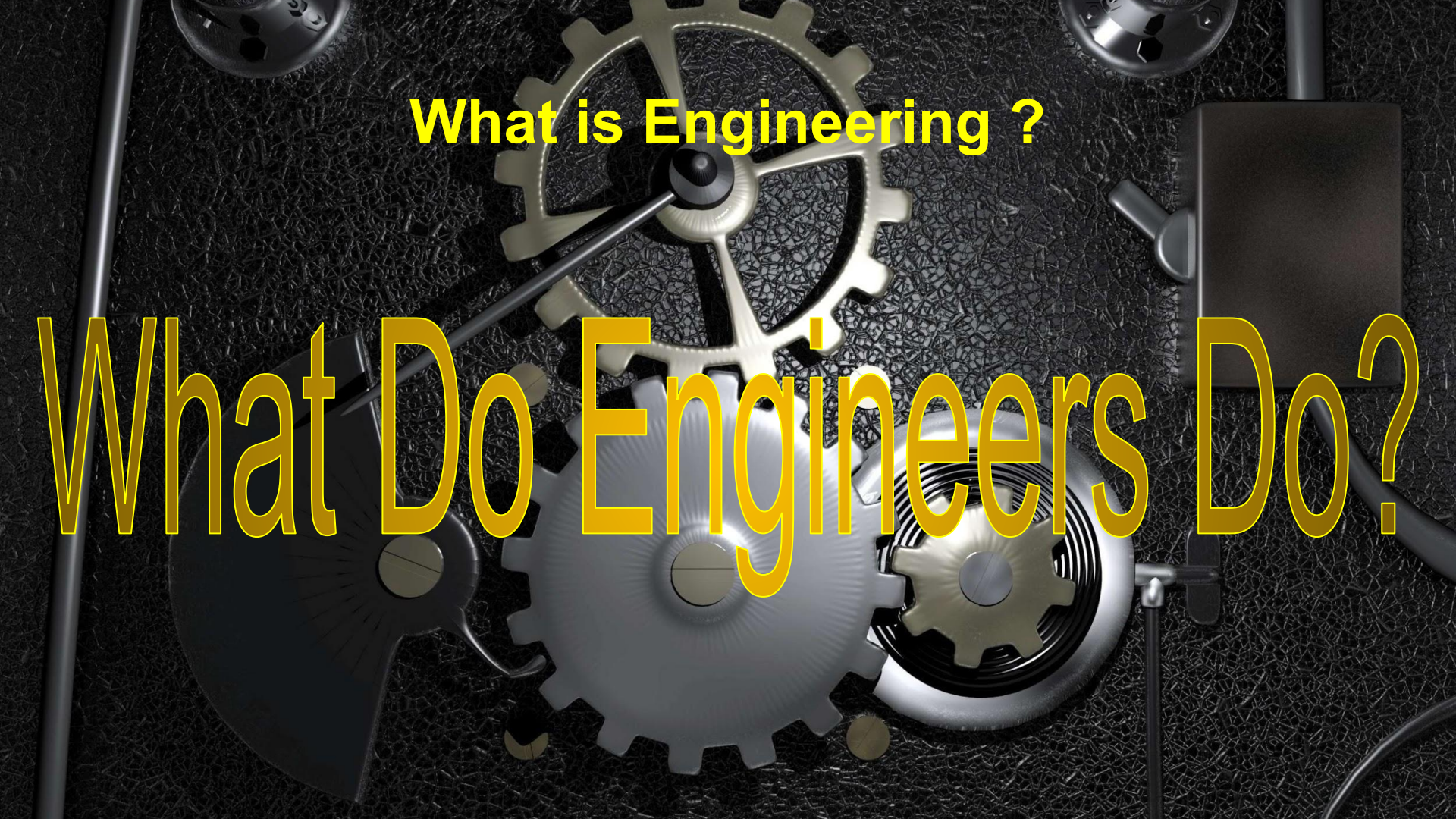
Introduction

My name is Logan Rupert

I would like to become a Mechanical engineer and build things.

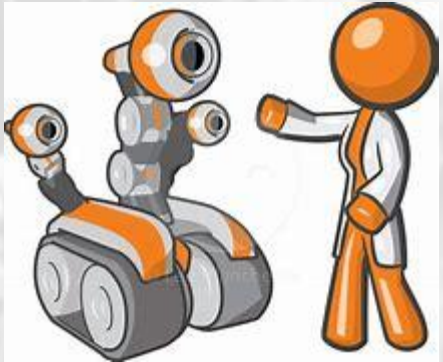
Fun fact: I used to play college football.

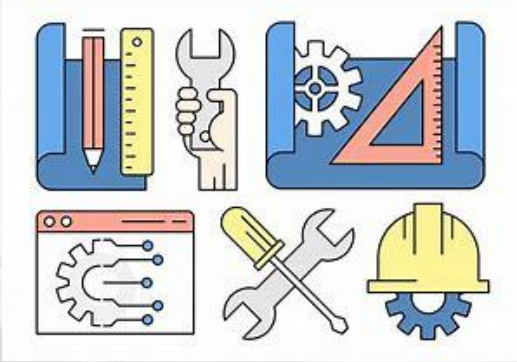



What is Engineering ?
What Do Engineers Do?

What Is Engineering?

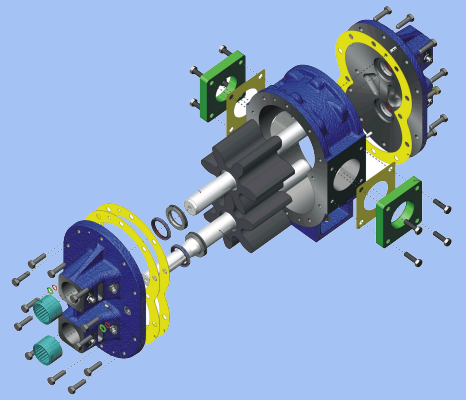
Engineering is a branch of science and technology concerned with the design, building, and use of engines, machines, and structures.



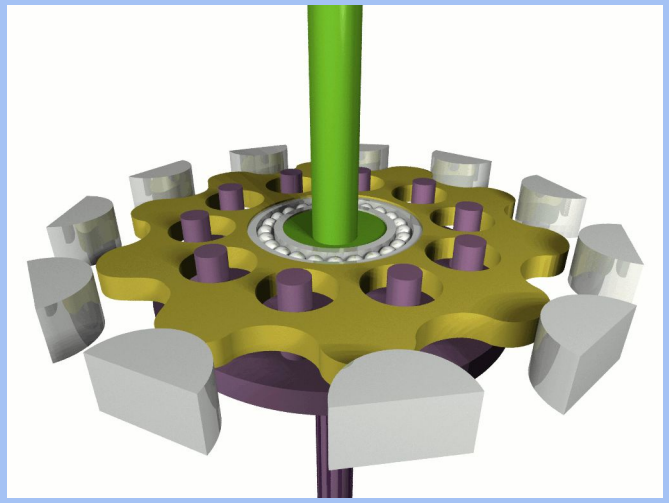


Fields of Engineering

There are many different types of engineers! Some examples are civil engineering, electrical engineering, and chemical engineering!



In Mechanical Engineering, viscosity plays an important role! Mechanical engineers design and operate different machines and tools to make our lives easier. If mechanical engineers did not know the concept of viscosity, the machines they design would self destruct because of friction and wear.



What Do Engineers Design?

Cars & Equipment

- Transportation is important.
- Safety is the most important aspect an engineer thinks about.

- Police cars have to be fast and safe.
- Police officers lives depend on these vehicles.

What Do Engineers Design?

Helmets

They protect your head from injuries!!
They prevent brain damage such as concussions.

What Do Engineers Design?

Satelites

We all watch TV and use cell phones.

These are critical for our infrastructure

- Tv
- Phones
- GPS
- Internet

Meet an Engineer

Meet Bertha Lamme Feicht

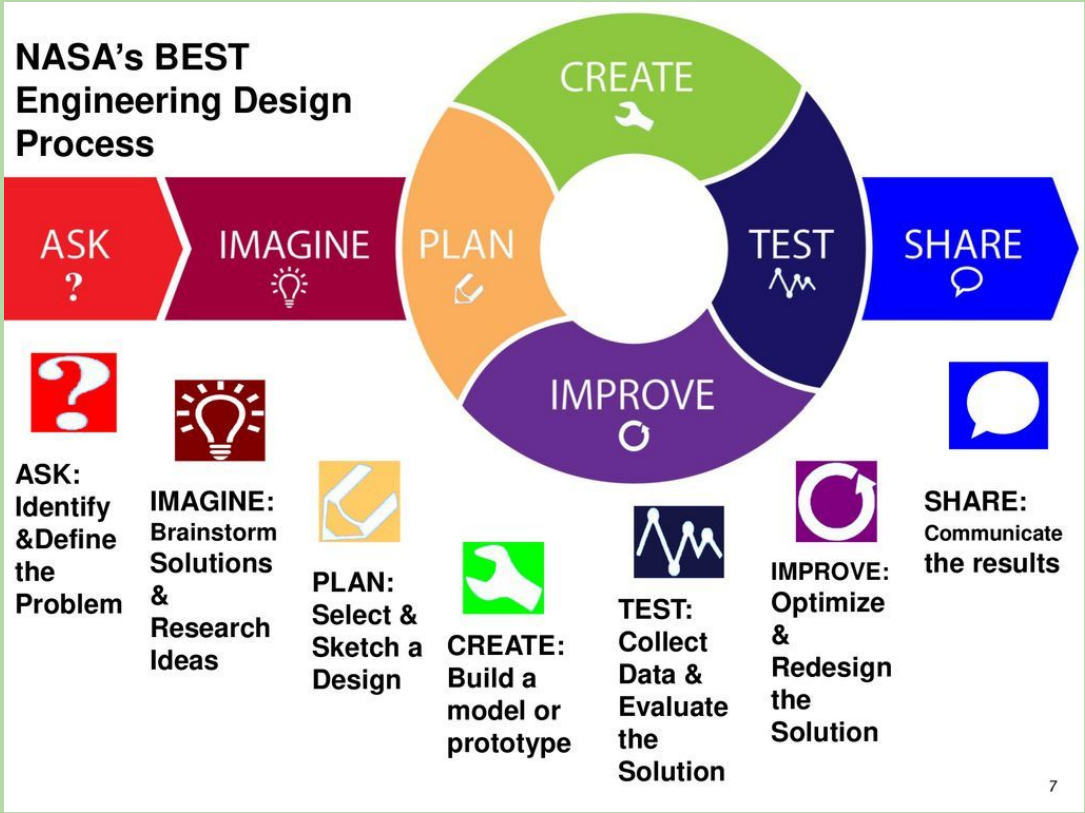
She was the first woman to receive an Engineering degree from Ohio State University as a Mechanical Engineer in 1893

She was hired by Westinghouse as their first female engineer.

There is a scholarship named after her form the Society of Women Engineers

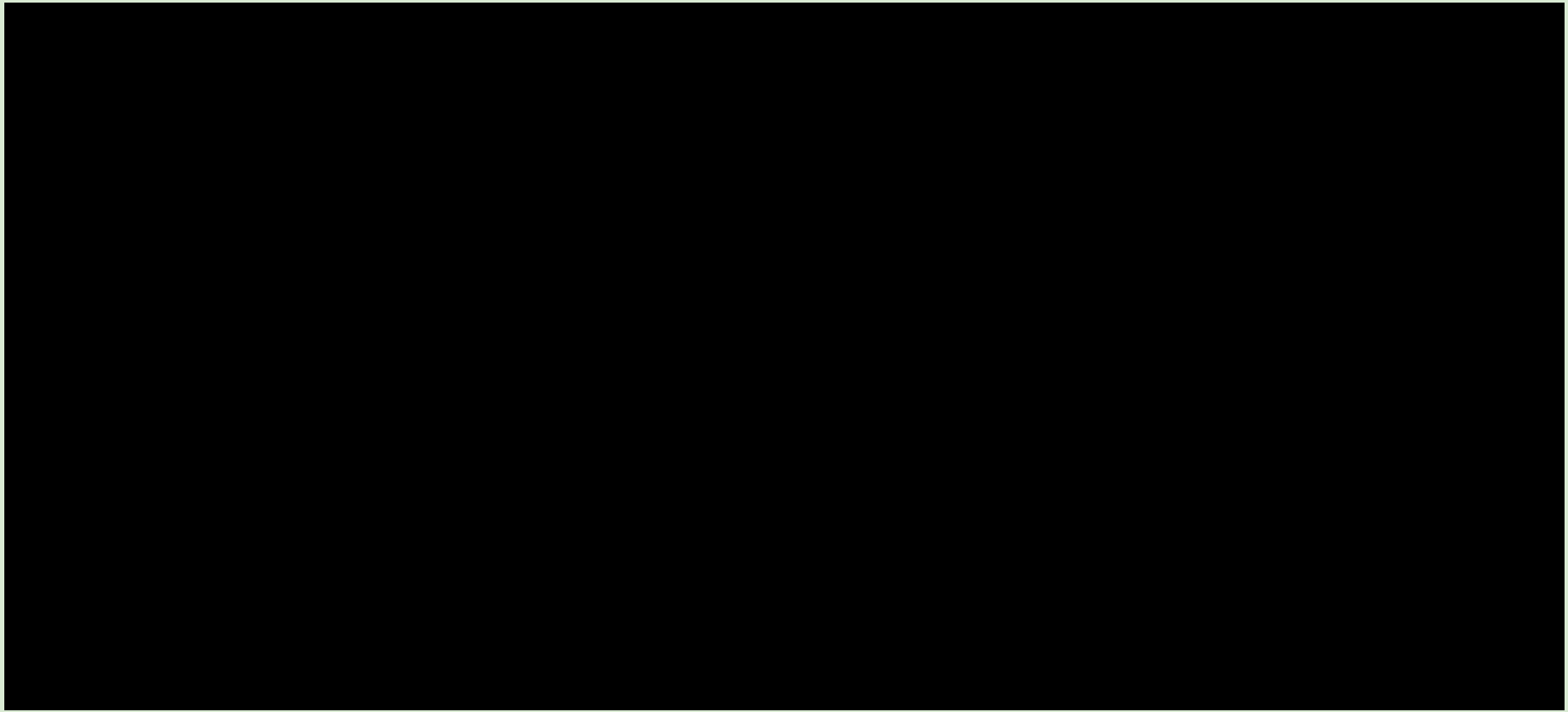
Presenter: Kalyn Pierce

The Engineering Design Process (EDP)



Presenter: Tyler

Engineering Design Process



Introduction to Slime

Today we will be experimenting with slime as a building tool!

Slime's greatest feature is its viscosity!

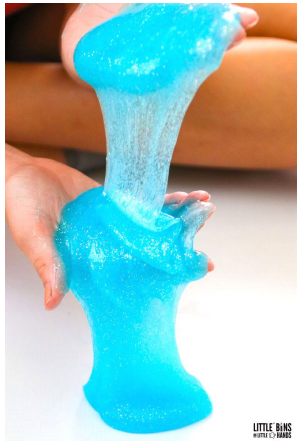
What does that mean?

Prediction: What type of slime do you think would make a better building tool: Slime with higher viscosity, or Slime with lower viscosity?

Presenter: Kalyn Pierce


What
Is
SLIME

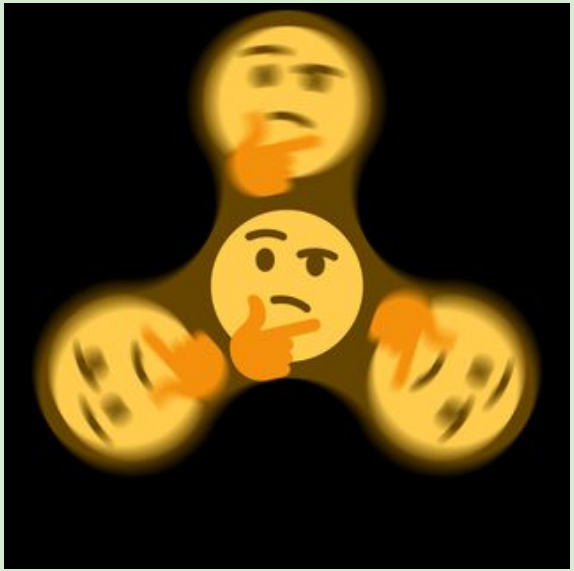
Engineering/Science Concept



Slime is a fundamental element in fluid mechanics. It is an example of a fluid whose viscosity is not constant, it changes depending on the stress or forces applied to it

Presenter: Logan

Viscosity in Liquids Explained



In your house find different liquids and see the difference in how they flow! For example you could use peanut butter and water. Which one has the best viscosity?

Check out this video!

Question: After doing this short activity and watching the video, what do you think is the relationship between gravity and viscosity? Are liquids with a high viscosity more resistant to gravity?

How To Make Slime

Today’s Engineering Design Challenge... (this is the Explore Phase)

We are going to make towers with slime!
This can be difficult since slime has a high viscosity, which is the ability to flow, so you can use resources around your house to help accomplish your challenge. Remember to think like an engineer and remember the concept of viscosity and use items in your house to your advantage! (popsicle sticks, pieces of cardboard, q-tips, plastic cups)

Try to complete this challenge within 30 minutes and see if your tower can stay up for at least 3 seconds! Measure your tower and see how high you can get your slime tower! Your goal for how high your slime tower can be 5 inches from the ground.

HINT: what could go into your slime that could make it less viscous or more viscous?

Presenter: Roxanna

Imagine: 2nd step EDP

Engineers have great imaginations when they are presented with a problem! Here's a few suggestions that might help you with your challenge:

- Draw a picture of how your tower would work. Include what materials you plan on using in your drawing and how you'll use them in your tower.
- Get help from anyone in your household
- Research from a computer at home in order to spark some ideas
- Try to make the tower so that it can hold a small weight such as a pencil.

Presenter: Roxanna

Recipes for Slime

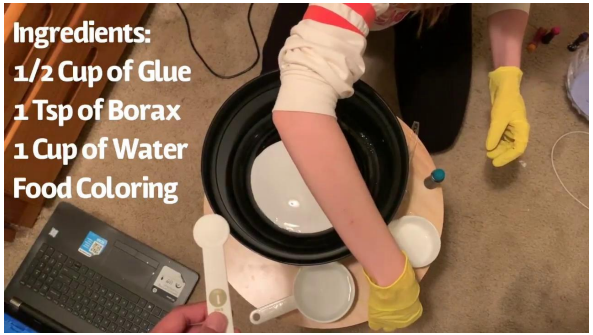
1st recipe

Materials you'll need:

- Elmer's Glue-All Multi-Purpose Liquid Glue (4oz or ½ cup)
- Borax mixture (1 teaspoon of borax powder dissolved in 1 cup of warm water)

Directions **(GET ADULT SUPERVISION WHEN MAKING THIS RECIPE)**

1. Pour the Elmer's Glue-All glue into a bowl.
2. Activate the slime by adding borax to the glue.
3. Add activator while stirring with a spoon or wooden stick. Keep adding the activator until the slime begins to form. When it's no longer sticky, you can take it out of the bowl and start kneading with your hands. Add a little more activator if needed. The slime should be thick but also stretchy



Recipes for Slime

2nd Recipe:

Materials you'll need:

- 1 cup of dry cornstarch
- ½ cup of warm water

Directions **(GET ADULT SUPERVISION WHEN MAKING THIS RECIPE)**

1. Put 1 cup of dry cornstarch into a medium-sized bowl. Use a spoon to break up any clumps of the cornstarch.
2. Put ½ cup of warm water into the bowl with the cornstarch and stir. Add the water little by little, say about 1 teaspoon to start out with and stir. The mixture should get a bit thicker as you stir. Keep stirring until it's slime!

Slime Recipes

Remembering viscosity, which slime recipe would you use to build your tower?

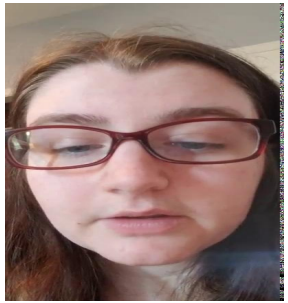
Which slime has the lowest viscosity?

PLAN (3rd step in the EDP)

Now that you've had a chance to draw your design and think about how you want it to work, it's time to start planning the rest

Look at the design you've drawn and think about what you've learned about slime.

Possible suggesting include using different slime viscosities to build your tower. Use slime with higher viscosity to bond your structure together, and use slime with lower viscosity to use as walls or decorations for your structure.



Presenter: Kalyn Pierce

SLIME TOWERS!!!!!!!!!

CREATE (4th step in the EDP)

It’s Time to Build!

Remember 30mins to construct, and then see it it stays for at least 3 seconds

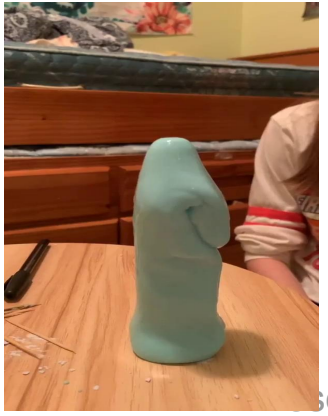
TEST (5th step in the EDP)

To test the stability of your structure, try adding weight to it!

Add pencils or other small items to the tower to see if it can support the added weight

Try creating an outside force like wind to see if your structure can stay standing. Use a fan or book for create wind by your structure and see if it gets knocked over

Check out these Videos!



What happened? (Explain Phase!)

https://padlet.com/rwood013/pw8tjcx3tbb8q6x3
Click on the link above to share your results with the password: slime123
Also use this website to brainstorm ideas with your peers to improve your designs.

Presenter: Team Member

How can you improve your design?

- Did you have any trouble with the slime being too runny?
- Did you have enough toothpicks to help the slime stand?
- Did the slime stick to the toothpicks?
- Did the tower stand on its own?

Slime has a texture to it and it is not completely smooth.
Can you come up with any ideas on how to better make your tower stand up by using slime?
Are there any other materials you could use to help make the tower stand on its own?

Presenter: Megan

IMPROVE your design! (6th step in the EDP) (Extend Phase!)

The improve phase is where we think of ways to improve our designs.

- If our design failed and the tower collapsed how could we strengthen it?
- Should the slime or the structure for the tower be improved?

- The design could be strengthened by changing the composition of the slime.
- A good way to improve the tower could be to examine the the structure material used and look at the design of the structure.

Presenter: Logan

What did you learn?

Quiz yourself and see if you can get a perfect score!

https://play.kahoot.it/v2/lobby?quizId=a39e0693-59ee-4a4d-a941-af19c8d362ce

https://create.kahoot.it/share/slime-quiz/a39e0693-59ee-4a4d-a941-af19c8d362ce

Presenter: Megan