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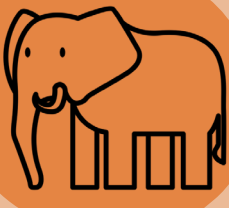
IMPERIAL SCIENCE SOCIETY NEWSLETTER

ISSUE #5

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TRY THIS SCIENCE EXPERIMENT TO GET RID OF LEAVENING!

ELEPHANT TOOTHPASTE WITH YEAST



INGREDIENTS:

- 1/2 CUP HYDROGEN PEROXIDE
- SQUIRT OF DISH SOAP
- FOOD COLORING
- 1 TBSP DRY YEAST
- 3 TBSP WARM WATER

SUPPLIES:

- * BOTTLE
- * SMALL CUP
- * FUNNEL (OPTIONAL)

INSTRUCTIONS:

MIX THE HYDROGEN PEROXIDE, DISH SOAP, AND FOOD COLORING IN YOUR BOTTLE. IN YOUR SMALL CUP, MIX THE YEAST AND WARM WATER, AND LET SIT FOR 30 SECONDS. COMBINE AND ENJOY!

NOTES:

IF POSSIBLE, DON'T USE NATURAL FOOD DYE. IT WON'T END UP ADDING ANY COLOR TO THE TOOTHPASTE.

THE SCIENCE BEHIND IT:

ELEPHANT TOOTHPASTE WITH YEAST IS CALLED AN EXOTHERMIC CHEMICAL REACTION, MEANING IT RELEASES ENERGY. THE YEAST SPEEDS UP THE PROCESS AND BREAKS DOWN THE HYDROGEN PEROXIDE INTO WATER AND OXYGEN GAS. THE GAS IS TRAPPED BY THE DISH SOAP AND CREATES A FOAMY ERUPTION. THE REACTION ALSO GENERATES HEAT, SO THE FOAM BECOMES WARM TO THE TOUCH.



CREDIT: THENOUNPROJECT.COM

THANK YOU FOR READING THIS MONTH'S EDITION OF THE ISS NEWSLETTER! IF YOU WOULD LIKE TO SEND FEEDBACK OR SIGN UP TO WRITE AN ARTICLE OF YOUR OWN, PLEASE EMAIL MATTIE.STEWART@IMPERIAL-ACADEMY.ORG.

A LOOK INTO GUNS

LEE BAKER | FLORIDA

Guns are unique little things or big things. Guns can be as small as your hand or as big as a truck. They can fire a small round such as a .22 or a .17 caliber.

This round is one of the smallest rounds, but let's talk about "BIG BOYS."

Tanks are just a gun with wheels; a tank can shoot a round that is way bigger than your average gun. OK, now let's talk about why the gunfire.

How exactly does it fire?

Well, that's what I'm going to be going over.

For a gun to work, you must load it so that something comes out of the barrel. Secondly, cocking, in the same way as a bullet, will not fire unless you have a hammer or a striker.

A hammer hits the center of the bullet and causes the bullet's shell to stay but the lead leaves.

While there are more parts to a gun, these are the main pieces that are required for it to work.

CREDIT: THENOUNPROJECT.COM

MAKING LIGHT WORK OF IT

JAMES STEWART | FLORIDA

Imperial Academy's Student Body President Caleb Flory gave an Imperial Science Society current event on February 12, 2026, about how tech companies are experimenting using light to compute information.

He started off by asking the club this question: "When you think of light, what first comes to mind?"

He received a multitude of answers, but he turned the club's attention to computers.

He brought up how two companies, "Lightelligence" and "Lightmatter," have created new processors using light. These processors will solve problems faster and with less energy consumption than normal computers. Flory quoted Anthony Rizzo a photonic engineer and Dartmouth College, said, "These processors can do the things we care about, and they can do it better than the electronic chips we already have." Light has already been used to move data in fiber optic cables but not to compute anything.

These new photonic composers are doing

math. They use light to do matrix multiplications used in AI and other forms of computing. This is important because AI is growing more complex, and computers need more power to properly run it. Flory brought up Moore's Law (discovered by Gordon Moore in 1965), which is that the transistors on a microchip double every two years.

However, Moore's Law is no longer valid, and electronic chips are not getting much better. Photonic computing could be a viable solution.

The only problem is less-than-perfect accuracy. Light can take on a large range of values (which differs from the current mode of ones and zeros) because of its large spectrum. These are making thousands of light reflections per second, bending the light and transforming it into strings of ones and zeros that the computer translates into what we see. This can result in some errors.

Flory ended with the quote from the CEO of Light Matter saying this is a real computer.

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CREATURES OF THE ABYSSOPELAGIC ZONE

NORA NICE | OKLAHOMA

It is said that humans have more knowledge about the infinite universe than about the ocean below. Three-quarters of the area of the deep-ocean floor lies in the Abyssopelagic Zone. The water stretches over 6,000 ft. deep. In this article, I am going to write about one layer and one topic of the vast ocean. I will cover an overview of the animals whose home is in the Abyssal layer.

It takes a special kind of animal to live 13,123 feet below sea level, not seeing any sunlight, living in eight tons per square inch of atmospheric pressure, (which is about a thousand times the standard atmospheric pressure at sea level.) Because it is so far from sunlight, the temperature is constantly near freezing. Animals living here must use bioluminescence to communicate.

The bathynomus giga is the Latin name for the giant isopod. These creatures can grow up to 16 inches, and their closest cousin is the land dwelling roly-poly. Isopods are bottom feeders who comb the ocean floor looking for decaying plant and animal material.

The next animal I am going to talk about is the rattail fish. Its scientific name is Coryphaenoides acrolepis. These fish have extremely long life spans, living up to 73 years. Their job is to be an apex predator of that ecosystem.

The tripod fish is a little bit of a deceiving name; it looks more like a drifting jellyfish. It got its name because of the long, stick-like fins. This fish is known as the "stick walker", and it ambushes its prey.

The vampire squid is a harmless scavenger. Its long feeding filaments collect drifting debris, which normally includes marine snow. Its unique characteristics make it not a squid, but a strange cephalopod whose features help it survive the dark ocean depths. There isn't much information on the bioluminescent anglerfish, but we do know it has a bioluminescent light to lure its prey.

I hope this article will help more appreciate the creatures of the deep ocean.

THE SCIENCE BEHIND HICCUPS



JEAN-PHILIPPE GUILLAUME | KANSAS

We've all probably experienced the odd, and somewhat slightly annoying occurrence of hiccupping. It is an involuntary reaction your body goes through and seems to come about at the worst possible times. Why do we hiccup? Is there a way to prevent it? And how do you get rid of them?

In all simplicity, hiccups occur when your diaphragm, a large muscle below your lungs that helps you breathe, suddenly and quickly contracts. This is immediately followed by the closure of your vocal cords, which make a "hic," sound.

Looking at it a little deeper, here are the ins and outs of what happens. Hiccups involve a reflex arc, which is the same idea your body uses in response to car hurtling directly at you. Certain stimuli will signal the nerves in your brainstem. These decipher the signal and trigger an immediate reflex. This reflex in response is the diaphragm contracting downwards, and simultaneously having your vocal cords snap shut loudly. This is where the actual "hiccup," sound comes from.

It all started when nerves detect any form of irritation or sudden input. This is why it can happen if you just drink something carbonated. That triggers this involuntary reflex.

So how can you prevent hiccups if they really irritate you and you get them often? You can start by eating slower and chewing your food more thoroughly. Don't gulp a lot of air while chewing or drinking. Then, if they're "caused by stress," learn to manage your stress better. Further research says to avoid excessive amounts of carbonated drinks and alcohol.

Finally, how can you stop them? One way is by holding your breath. This increases the carbon dioxide in your bloodstream, which relaxes the diaphragm. Another way is to drink water. Anything that interrupts the hiccup reflex or increases your carbon dioxide can help.

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