

TRENDING NEWS:

1 Saving the Bees: US Approves Innovative Vaccine for Pollinators

Recently, the first vaccine in the world for honey bees was allowed to be used in the United States. The U.S. Department of Agriculture (USDA) gave a short-term license to the company, Dalen Animal Health, for the vaccine.

Honey bees, along with birds, bats, and other animals, help in a process known as pollination. Pollination is the transfer of pollen from the male parts to the female parts of plants. Pollination leads to the formation of fruits and seeds. Pollinators are responsible for one-third of the crop production in the world.



Icicles aren't crystal clear, and neither are the physics that form them.

However, a decrease in the number of honey bee colonies has been seen each year since 2006 in the U.S. This decrease is mostly due to factors such as parasites, pests, and diseases. These factors harm the health of bee colonies. Eventually, the worker bees of the colony leave the beehive and the queen of the colony behind. This phenomenon is known as Colony Collapse Disorder (CCD).

The vaccine made by Dalen Animal Health prevents disease and CCD. The bacterium, *Paenibacillus larvae*, is known to cause American foulbrood disease.

The vaccine works by adding inactive bacteria into the food for the queen bee, known as royal jelly. Royal jelly is a milk-like substance made by worker bees to feed the queen and larvae. When the queen bee is fed royal jelly by the worker bees, some of the vaccine is stored in her ovaries, which are organs that play a role in reproduction. Therefore, the larvae of the queen bee become immune against the disease.

The American foulbrood disease is known to spread rapidly. This bacterial disease damages bee colonies by infecting the bee larvae. Furthermore, it cannot be treated. The only known cure has been to burn the colony of infected bees along with the hive. The approved vaccine will help by protecting bees from American foulbrood disease.

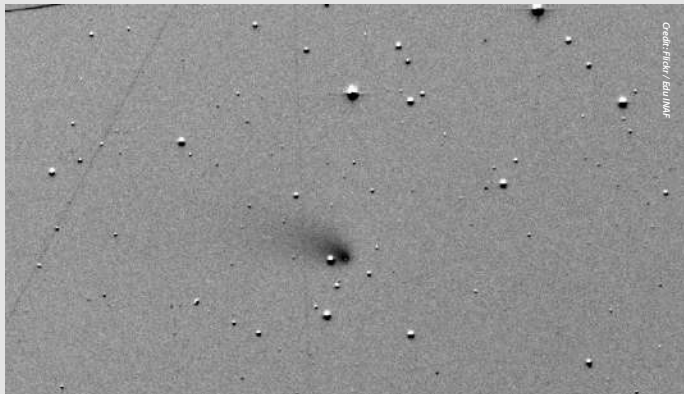
Soon, the vaccine will be made available to a few beekeepers. Eventually, it will be sold by the company in the U.S. this year. This vaccine may be a step in protecting honey bees from many more diseases in the future.

2 Rare green comet visits Earth for the first time since Ice Age

A rare comet - named the C/2022 E3 (ZTF) - is predicted to pass by Earth on February 1, 2023. Because it takes 50,000 years to orbit the Sun, C/2022 E3 (ZTF) may be classified a long period comet. C/2022 E3 (ZTF) is passing by Earth again after 50,000 years - its previous visit was during the last ice age, when early humans roamed the Earth.

C/2022 E3 (ZTF) was identified by Bryce Bolin and Frank Masci using the Zwicky Transient Facility (ZTF) survey on 2 March, 2022. The Zwicky Transient Facility is a wide-field survey, meaning that it employs wide-field cameras to scan the sky, using the Samuel Oschin Telescope at the Palomar Observatory in southern California.

At first, C/2022 E3 (ZTF) was misidentified as an asteroid. However, further observations showed the presence of a condensed coma. A coma is a cloudy covering made of ice and coma dust present around the head of a comet.



Comet C/2022 E3(ZTF)

A coma gives a comet a “fuzzy” appearance. Comets are believed to have formed early in the history of the solar system. Comets are made of dry ice, mineral grains, other frozen gases like methane and ammonia, and some organic compounds.

The green color of C/2022 E3 (ZTF) is mostly because of the presence of diatomic carbon around the head of the comet. Ultraviolet radiation from the Sun causes the carbon molecules to undergo a photodissociation reaction, which is the separation of molecules into atoms because of light. The carbon molecules breaking causes the green glow.

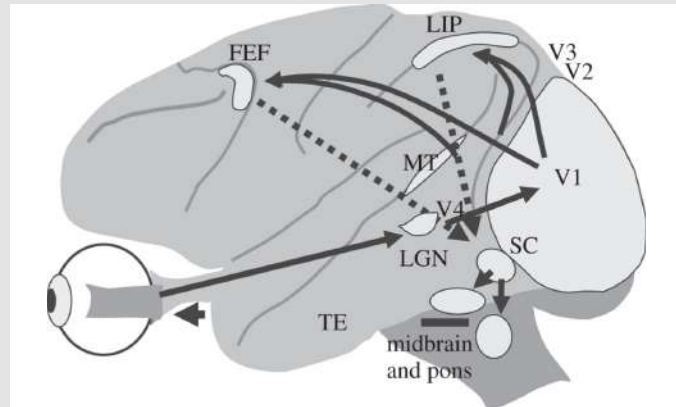
C/2022 E3 (ZTF) will be visible from Earth to the naked eye as a bright green comet, according to NASA. The comet may be visible in the morning sky in the Northern Hemisphere during January. In the Southern hemisphere, the comet may be visible in the morning sky in early February.

When the comet C/2022 E3 (ZTF) passes the Earth, and then later on the Sun, the makeup of the comet will be examined and more details may be revealed about the evolution of the solar system from 50,000 years ago. When C/2022 E3 (ZTF) reaches closer to the Sun, the heat will melt the comet’s layers, allowing scientists to better study its makeup.

Science Everyday What is Eidetic Memory?

When characters on TV like Mike Ross from the show “Suits” and Sheldon Cooper from “The Big Bang Theory” flex incredible memory abilities, you may start to wonder if people like them are real. Well, they are, and this special ability is known as an eidetic memory.

An eidetic memory is also known as a photographic memory.



The pathway through which VI enters the brain. There are different pathways for short-term and long-term memories.

It is a special type of memory in which a person can store lots of visual information (VI), and store it for a very long time. Before going into the details of this ability, let’s understand what a memory is. According to the Oxford dictionary, memory is the capability by which the mind stores and remembers information. The two keywords to note down here are “store” and “remember” (recall).

Let’s start by seeing how memories are stored. Let’s use visual information (VI) as an example. The information enters our body through our eyes. In the eye, it hits the retina, passes through the optic nerve, and then enters the brain. Most VI is stored for a short time. This VI gets stored in a part of the brain located towards the front, called the prefrontal cortex. This information is remembered for about 20–30 seconds. On the other hand, for a memory to be stored long-term, it needs to enter the hippocampus.

There are many ways in which memories are stored long-term. Repeating information over and over again will help it get stored. This is why when you read a textbook very often, you may recall the exact page numbers on which you find certain things.

Recent studies show that the hormone adrenaline (ADR) also helps in creating long-term memories. This is why you can remember exciting events very well, even if they only happen once. People with eidetic memories can store long-term memories without the help of ADR.

A person with eidetic memory can describe an image with all the little fine details after observing it for only as much as 30 seconds. We’re still not completely sure what causes people to get this ability, but research has shown that it can either be caused by genetics or by **environmental factors**. Some people have an even more incredible sense of memory,

remembering every single detail of their life from as young an age as seven years old. These abilities are so new to us that they're not even in textbooks yet!

Glossary

Retina: a layer at the back of the eyeball that contains cells sensitive to light, which trigger nerve impulses that pass to the brain via the optic nerve

Prefrontal cortex: a part of the brain located near the front, right behind your forehead

Hippocampus: a part of the brain located near the base of the brain, where it joins the spinal cord

Adrenaline: a hormone secreted by the adrenal glands that is associated with feelings of excitement and fright.

Environmental factors:

In this context, an environmental factor is any external factor involved in the upbringing and growth of a person; anything that is not predetermined by genetics.

STEM Challenge/ Science Experiment

The floating wire challenge

- **Challenge criteria:** Iron objects sink in water, right? However, this challenge involves you using science to make a small piece of iron wire float on water.
- **Materials needed:**
Iron wire and a bowl of water.
- **Challenge tips:** Water acts like a stretched membrane, like a Saran wrap. The trick is to keep the piece of wire on the water surface for a long time, with some support, that can be removed without your intervention. Flatter objects float easily.
- **Challenge reflection:** Ships are made of iron, yet they don't sink. Why is it so?



Did You Know?

When Helium is cooled to almost absolute zero (-460°F or -273°C, the lowest possible temperature), it becomes a liquid. This liquid flows against gravity and will start running up and over the mouth of the container in which it is stored.



Brain Teaser:

A vast estate contains seven houses. Each house contains seven cats. Every cat lords over a flock of seven mice. Each mouse runs through a forest of seven stalks of spelt. Each plant grows seven lone grains.

In all, how many objects can you count in the houses?

Credit: Popular Mechanics

Answer to be published in the next edition

Previous edition answer:

Imagine these ships are only traveling 120 miles. The first ship moves at 35 mph. The second ship moves at 30 mph until it hits half the total distance, then starts moving at 40 mph.

Consider where the ships are after three hours and how long it will take them to cover the remaining miles to the finish line. The second ship is easy. At a speed of 40 mph, it takes another half hour to travel the last 20 miles. The first ship is only 15 miles away. At a speed of 35 mph, it crosses the finish line in just a little bit less than half an hour—25.7 minutes. The first ship wins!



Science Video: How Do Birds Know to Fly South?

It is known that a few bird species leave their homes and fly south for the winter. This movement of birds which occurs according to the seasons each year is known as migration. Why do birds fly south for the winter? There are a few reasons why birds migrate.

Many bird species are unable to find food, such as insects or nectar, as the season changes. For example, bird species that feed only on insects in the north during the summer find a shortage of food in the fall. Thus, these birds need to move to a warmer location, mostly in the south, to find food.

Also, many species of birds breed in one place and spend their winters in another place.

The regions where birds breed are known as breeding grounds. The regions where birds spend the winter are known as overwintering grounds. Therefore, migration is also important for birds to travel between breeding grounds and overwintering grounds.

How do birds know when to migrate? Birds can sense when it is getting colder and when there is a shortage of food supply. The timing of migration is also determined by the changes in the length of days, which get shorter in the winter.

Thus, when winter approaches, birds migrate in groups called flocks towards the warmer regions in the south. Usually, V-shaped groups of birds may be seen in the sky as they migrate from one region to another.

The bird which migrates the longest distance is the Arctic tern. Birds such as the Arctic tern use the Sun, the stars, and the Earth's magnetic field to create mental maps to reach their location. How do birds know in which direction to fly?

Birds store deposits of a mineral called magnetite in their beaks. This mineral interacts with the Earth's magnetic field. Furthermore, special proteins called cryptochromes are present in their eyes. These proteins interact with blue light, exciting molecules called flavins inside these proteins. Electrons in these flavins spin and act like tiny compasses in birds.

Thus, this is how birds migrate and know in which direction to fly. Watch this video to learn more about how birds know to fly south for the winter!

[Scan QR code to see the video](#)



Quiz:

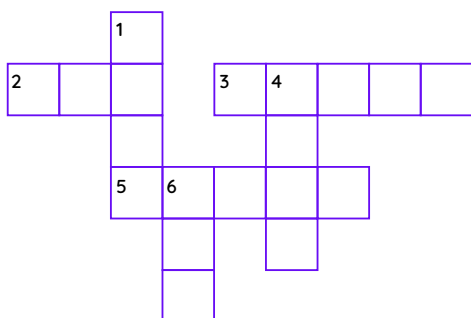
Which planet has the most greatest number of moons?

- A. Saturn C. Uranus
B. Jupiter D. Neptune

[Scan for more science trivia quiz](#)



Can you do a Crossword?

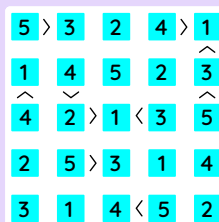


Across

- Which is lighter? Ice or water?
- A part of the large intestine
- A parasitic insect that sucks blood

Down

- The smallest unit of life
- The largest species of dolphin
- A bird that cannot fly



Previous edition Futoshiki answer



Science in Depth

The 'Dragon Man' Could Be the Closest Human Ancestor



Millions of years ago, humans appeared on this planet. The Ardipithecus is the earliest known human ancestor. Over the course of 5 million years, several human species evolved. In this article, we discuss the most recent human ancestor, whose skull has been discovered recently!

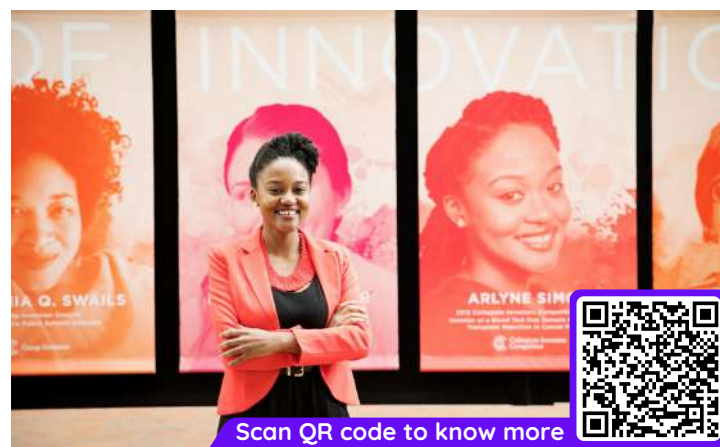
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STEM Career:

Science Like A Girl: Inventor and Author Arlyne Simon

When a nurse hooks a syringe to a syringe pump, she isn't thinking about the regulations and research it took to ensure a to save a life. When an expectant mother looks at an ultrasound,



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