

TRENDING NEWS:

1 Closest black hole to Earth discovered

Within a black hole, the laws of physics cease to hold. Now we humans have one as a neighbor. This black hole was discovered using the Gemini Observatory in Hawai'i. It is the closest black hole ever found, at just 1,600 light years from Earth. Scientists have named this black hole Gaia BH1. However, it is not as large as a supermassive black hole. To put its size into perspective: Sagittarius A, the black hole at the center of the Milky Way, is 2,000 times smaller than the black hole at the center of the galaxy M87*.



Black hole discovered in the astronomical backyard of Earth; scientists dub it Gaia BH1

Gaia BH1 is much smaller than Sagittarius A. In fact, astronomers estimate the presence of over 100 million black holes of this type, called stellar-mass black holes, in our galaxy. A black hole in our astronomical backyard might sound like a sci-fi story plot. In reality, this black hole poses no threat as of now, and is an interesting cosmic discovery.

2 Martian meteoroid causes massive marsquake

On Christmas Eve last year, NASA's InSight lander recorded a marsquake (same as an earthquake, but on Mars, hence marsquake) of magnitude 4, which is the biggest ever detected by NASA. The cause was later discovered by the Mars Reconnaissance Orbiter (MRO), which found a new crater from a relatively fresh meteoroid impact.



Crater on Mars captured by HiRISE

The meteoroid is estimated to have been 16 to 39 feet (5 to 12 meters) wide. On Earth, this meteor would have burned to dust before impact due to friction in the atmosphere. On Mars, the atmosphere is thinner, and so the impact was unimpeded. The crater had exposed subsurface ice, scattering some of it around. The images were recorded by the HiRISE (High Resolution Imaging Experiment) camera on the MRO. This finding can be of huge importance if humans choose to colonize Mars, as the ice will be a source of water.

STEM Around Us

Creating environmentally safe sunscreens

In shallow waters close to the shores of islands and continents, there are colorful ecosystems called coral reefs. These reefs are built by coral polyps—a marine animal.

Although they only occupy a tiny fraction of the Earth's surface, coral reefs offer food and shelter to nearly 25% of marine life! These diverse habitats are often called the rainforests of the seas.



Sunscreens are safer for corals now

Unfortunately, the rise of ocean temperatures has caused some of these reefs to lose their color through a process called bleaching.

Sometime in 2016, a scientist named Craig Downs announced to the world that an ingredient in sunscreens called oxybenzone seems to disrupt coral polyps and puts coral reefs at risk of bleaching. Soon after, countries across the globe banned sunscreens that contain oxybenzone.

Since then, scientists have been on the hunt for the next generation of sunscreens that are not only effective but also environmentally safe. Most scientists have turned to animals that can naturally filter out harsh sunlight for answers!

One exciting group of compounds is mycosporine-like amino acids (or MAAs for short). Many kinds of algae and fungi use these nitrogen-based compounds as sun protection. This is just one of the many sun-care solutions that the ocean can offer!

While the potential of these compounds is exciting, scientists are worried that extracting these compounds may be harmful to the environment. Even with caution, there's still a long way to go before they can be a part of your skincare routine.

STEM Challenge/ Science Experiment

Bonsai tree for beginners

Bonsai is the art of growing miniature trees in a pot. These are cute and cool for display, but they take a lot of patience. Here, you will learn to make a bonsai.

- Select a suitable species of tree for your climate. Not all bonsai thrive or grow in every climate. Juniper, pine, cedar, oak, and elm are good choices for beginners.

- Decide where you want to display your bonsai. For a bonsai that will be kept inside, you can use a Ficus, Gardenia, Camellia, or Kingsville boxwood. For outdoor display, good choices include juniper, cypress, cedar, maple, or birch.
- For a good bonsai, you must choose a pot that restricts growth but holds enough soil. When you water your tree, it should absorb moisture from the soil through its roots.
- When you buy a tree sapling, you need to take care of it so that it is in tip-top shape when the time for repotting comes. Repotting is transplanting the tree into another pot. You can reduce watering a few days before repotting because working with dry and loose soil is easier.
- Remove the tree from its current pot and gently clear soil from its roots. Make sure not to break or tear its main stem.
- If the growth is not efficiently controlled, bonsai trees can outgrow their pots. To ensure your bonsai tree remains manageable, prune its roots when you pot it. Cut any large, thick roots and any roots that can move upwards, leaving a network of long and slender roots that will reside near the topsoil. Water is absorbed through the root tips, so, in a small container, many thin root strands can absorb water better.
- For a good bonsai, you need good soil. Organic compost can contain humus, dead plant debris, and potting soil. The combinations below by David Lieu on Dengarden are as follows:

Bonsai Mix Recipe

Organic/Inorganic Components	Basic Bonsai Mix	Tropical Bonsai Mix	Deciduous Bonsai Mix	Conifer Bonsai Mix
Akadama/Turface	50%	40%	50%	60%
Lava rock/Diatomaceous earth	25%	25%	30%	30%
Organic Compost Component	25%	35%	20%	10%

- Finally, take care of the plant and watch it grow into a stout, tiny tree. For 2–3 weeks after re-potting your tree, leave it in a semi-shaded area that is protected from the wind and direct sunlight. Water the plant. Don't use fertilizer until the roots have adjusted themselves in this new soil.

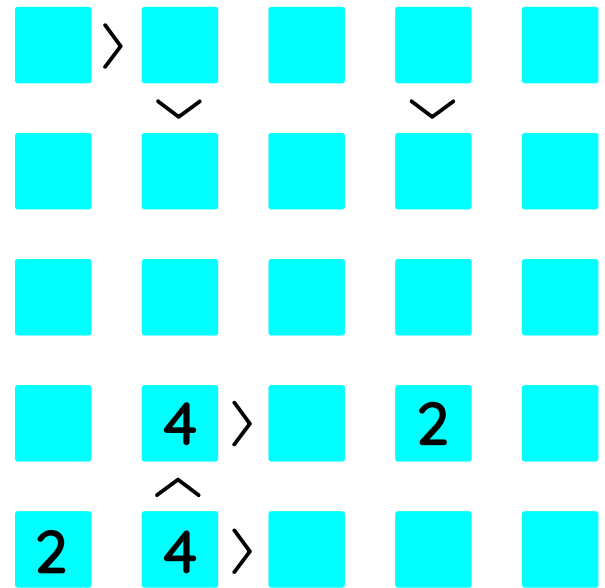


Brain Teaser:

Previous edition answer: $D_2E_2F_2$



Can You Do a Futoshiki?

[illegible]

Previous edition answer



This symbiotic relationship is strongly dependent on the temperature of the surrounding water.



*Acropora corals "bleach" by turning a purple-blue shade.
The Ocean Agency/XL Catlin Seaview Survey*

As the water warms, zooxanthellae are expelled from a coral's tissue, causing it to lose its color and a major source of food. This process is known as coral bleaching."

Are corals plants or animals?

Corals are animals. They are not plants because they cannot make their own food. Instead, they have tiny arms that look like tentacles which they use to catch food and sweep it into their mouths.

Corals are actually made up of tiny creatures called polyps that have gathered together to form colonies. But corals also depend on another organism to survive. Microscopic algae live on healthy corals and provide many benefits to sea animals.



Scan QR code to know more



STEM Career:

Watch Behavioral Ecologist Researcher Rachael Bonoan at Work

Hi, I'm Rachael! I've been studying insects for eight years, but I've been observing them for most of my life. As a kid, I spent summer evenings collecting June bugs, moths, caterpillars; whatever I could find. I kept my finds in mesh bug cages for a couple of hours, made observations, and set them free. I didn't realize it at the time, but I was building a foundation in field biology!

In April, I began my fieldwork by searching lupine for Puget blue caterpillars (baby butterflies!). The caterpillars have spent the winter underground and make their way to the soil surface as it warms up.



During this time of the year, the prairie is wet most mornings —my rain pants keep me dry and comfortable while on the ground.

In high school, my favorite subjects were biology and anatomy and physiology. So I went to college at the University of Massachusetts Dartmouth as a biology major. My plan was to go to medical school. But everything changed when I received a fellowship to study butterfly nutrition.

One day, while I was chasing a butterfly through a meadow, it hit me. Natasha, my mentor, got paid to catch and study insects. I could get paid to do what I had been doing my whole life too! I continued my biology major after my internship. But instead of medical school, my focus was on graduate school where I could study insects.

After college, I joined the Starks Lab at Tufts University and studied honey bees. There, I learned how to design experiments after making observations, learned how to keep bees, and mentored students. Studying honey bees also helped me meet a lot of awesome people beekeepers! While in graduate school, I co founded the Boston Area Beekeepers Association. I even travelled around the U.S. to share my research with beekeepers.

After they crawl up from their winter long nap," called diapause, the bright green caterpillars eat lupine leaves and stems. During this time the caterpillars are protected by ants! When a caterpillar is threatened (say, by a wasp), it signals to the ants for help. The ants come to the caterpillar's rescue.



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