Tuesday 4 April 2023. Delivered weekdays at 6:30am London time. No preparation. Print friendly.

THEDAY Build a better world

NEWS DETECTIVES

TODAY'S BIG STORY

Robotic beehive setting the bug world abuzz

Could technology save our insects? A team of scientists argue that a high tech beehive is the best way to future-proof the world's bees.

Buzzworthy: The heated robohive was shown to help bees through a cold snap

Would bees be better off with smart central heating?

Scientists have finally asked this question, and they say that the answer is yes. They have built a robotic **hive** to help bees make it through a **harsh** winter.

Bees need more help than they used to. Many are **plagued** by Colony Collapse Disorder.

This is when worker bees die off or do not return to the hive, leaving their queen defenceless.

Scientists have been trying to trace the cause of this mysterious bee **apocalypse**. Most people point to **pesticides**, climate change, Varroa **mites**, or a mixture of the three.

That is why the scientists built their robotic hive. They want to protect the bees, who are hit hardest in winter. Beekeepers can lose 20% of their bees then.

They used wood and beeswax so the bees would feel comfortable living in it. But inside there is a complicated robotic heating system. It monitors the bees and adapts the temperature to their needs.

About 4,000 bees made the robotic hive their home, and the scientists were able to stop any colony collapse.

This is not just important for the bees. A third of the crops we eat are dependent on **pollinators** such as bees to help them spread and grow.

The robotic beehive can help the bees, but also all the other plant and animal species that depend on them.

THE STORY SO FAR

Beekeepers began to notice bee populations tumbling in the 1990s. Scientists coined the term Colony Collapse Disorder to describe what was happening in 2007. CCD has slowed in recent years.

KEY WORDS

Hive: Where bees live

Harsh: Rough

Plagued: Made sick

Colony: A family of bees with one queen

Apocalypse: The end of the world

Pesticides: Poisons for insects

Mites: Tiny spider-like creatures

Pollinators: Animals that gather pollen from plants and spread it

YOU DECIDE

Could technology save our insects?

YES. By building better technology we can see how and when bees need our help.

NO. The real worry is for wild bees and we do not have any technology that can help them yet.

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THE DETECTIVE ZONE

SPOT THE FAKE

One of these three news stories is fake. Which one?

Fast food chain opens tiny restaurant for bees

Doctors find four bees living in woman's eye

Protestors let bees loose on Chelsea flower show

Build THE Change

The bees' smart home includes heating for cold winters. What do you think other animals would need in their smart home? In this challenge, you will build a smart home for an endangered species.

Step 1: Think about your design! Which endangered species will you design a home for? What do they need to live a happy and healthy life?

Step 2: Create your design! Draw a picture of your robo-home and add labels for its features. If you have time, you could use LEGO® bricks or bits of recycling to make a real-life version of your smart home.

Share your genius
Show your work to your class!

Upload a photo of your work to the Build the Change gallery by scanning the QR code and have your work displayed to inspire real-world change.

Did you know?

Bees have five eyes and can fly at up to 20 miles per hour!

Talking point

Would you feel bad about swatting a bee if it stung you?

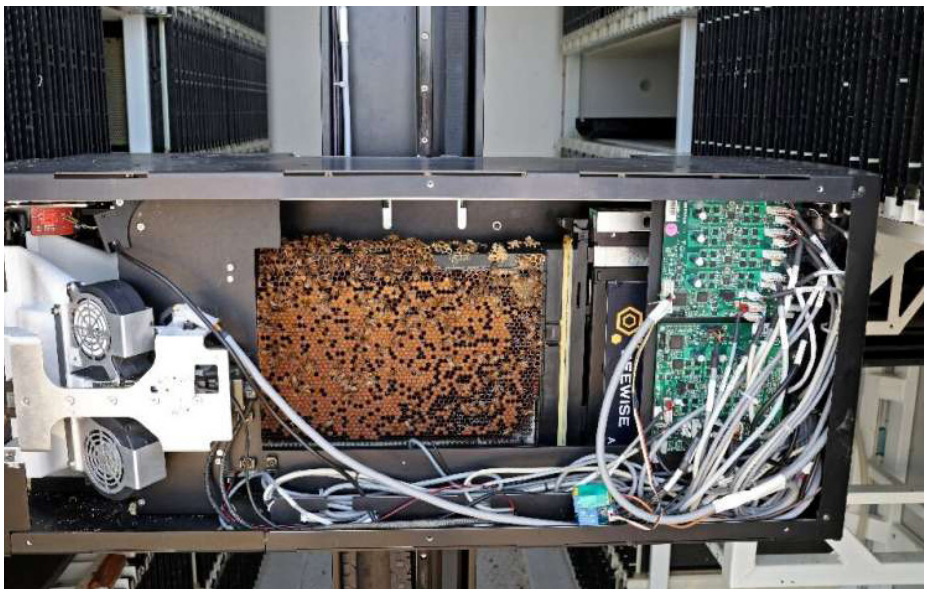
Amaze someone

Bees that have found pollen tell their friends by dancing what is called a "waggle dance". The direction of the dance is the direction of the pollen.

Keeping bees for honey is ancient. There are 8,000-year-old cave paintings which show beekeepers.

THE EXTRA PAGE

Insect smart homes could help struggling bees



Hive mind: The robotic hive will allow beekeepers to learn more about their bees' movements.

Smart homes decked out with motion sensors, automated lights, and precision thermostats are often considered must-haves in futuristic dwellings. But could they lead the way for beehives, too?

In a new paper published in Science Robotics, researchers showed off a new design for a robotic beehive that can monitor a colony's behaviour and even resuscitate honeybees endangered by extreme cold. While the system probably would not work for wild bee populations, it could help beekeepers who raise insects for agricultural purposes.

Today, a mysterious condition known as colony collapse disorder threatens honeybees worldwide. When CCD strikes, a colony's worker bees suddenly die, leaving the queen and young bees defenceless. In the winter of 2006, when CCD was first named, some beekeepers reported up to 90% of their hives suddenly dying.

Dead bees spell bad news for the global food supply: honeybees are essential pollinators for many agricultural crops. "This is a serious problem," Rafael Barmak, a roboticist at the Swiss Federal Institute of Technology Lausanne in Switzerland and the first author of the study, tells *Inverse*.

Scientists suspect that a combination of climate change, pesticides, and invasive varroa mites leave bee colonies in a weakened state. All this chaos makes it difficult for them to deal with harsh winter weather; they may slip into a "chill coma" and die. Many beekeepers lose up to 20% of their insects each winter.

The new robotic hive has thermal sensors, heating implements and a programmable control panel. It could help revive a colony on the brink of collapse. But before researchers could test it, they had to convince the bees to pack up and move in.

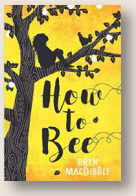
Bees look for cues like texture and smell, Barmak explains. If the robotic hive were made of a harsh material like metal, they would not go near it. Similarly, if it had wires and cables running through its chambers, the bees would try to chomp through them with their mandibles.

To make the robotic hive nice and welcoming, Barmak and his team constructed it from plexiglass and laminated wood, sandwiching circuit boards between these materials. Then, they coated the whole structure with beeswax. Sure enough, the insects took to the hive.

The scientists monitored the roughly 4,000 bees through the winter season spanning late 2020 and early 2021. When a cold snap rendered the colony comatose, they were able to activate the heating and bring the bees back from the brink of a chilly demise. ■

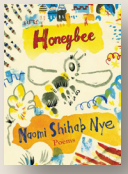
This is an edited version of a story from

Read more on this topic



How to Bee by Bren MacDibble

Old Barn Books



Honeybee by Naomi Shibab Nye

HarperCollins

Answer to the spot the fake

Protestors let bees loose on Chelsea flower

Build THE Change

This week's challenge is part of the LEGO® Build the Change programme. It can be done at school or as homework, and parents can help upload photos of pupils' work to the online gallery.

Visit the gallery at https://bit.ly/btcgallery and feel free to use it as discussion point in class.