Scientists are teaching bees how to do basic math

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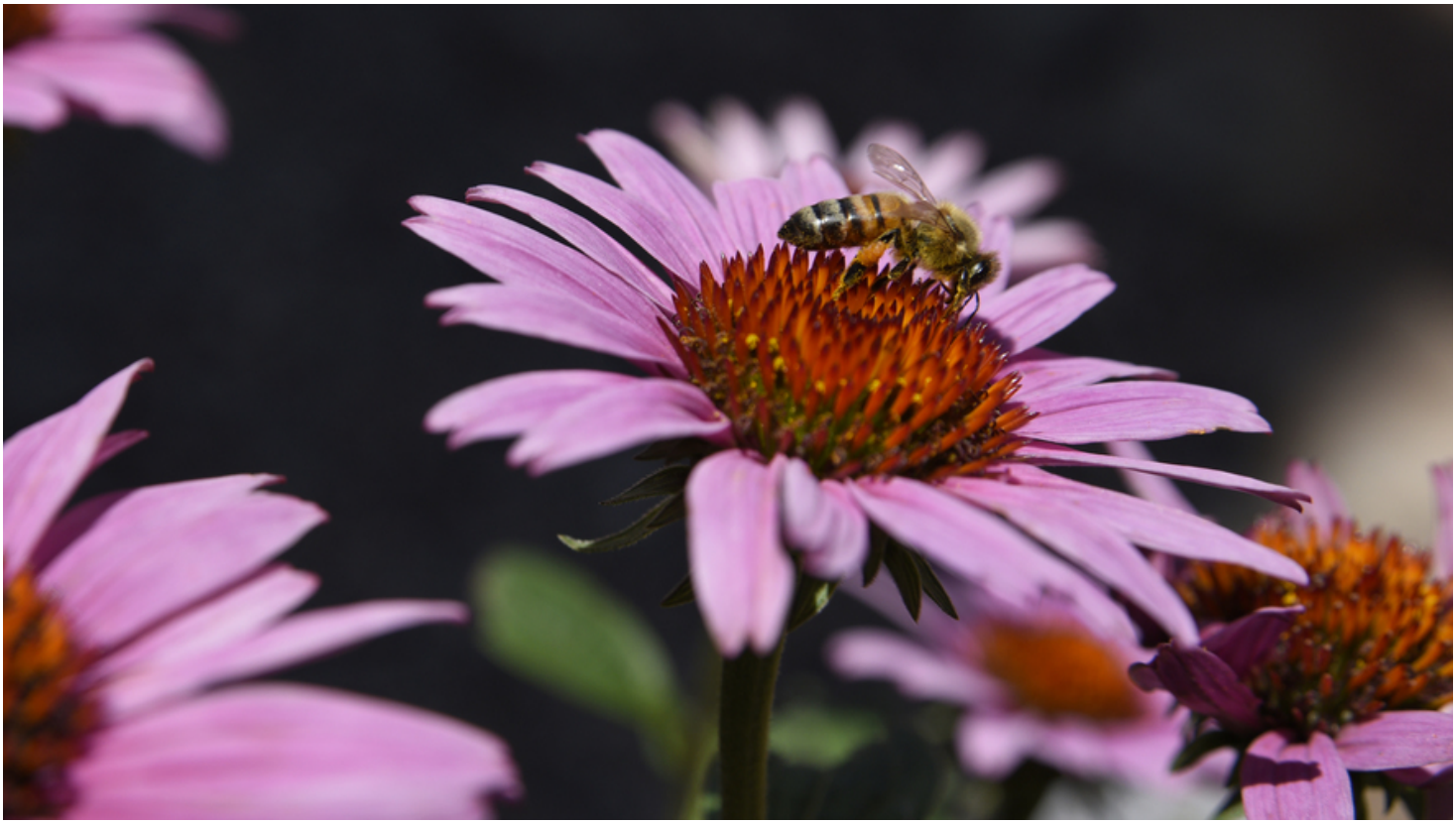

A honey bee visits a purple cornflower blossom in Santa Fe, New Mexico. Photo by: Robert Alexander/Getty Images

We know bees are good at making honey. They're pretty good at math, too.

A group of scientists are training bees. The scientists wanted to see if they could do simple addition and subtraction.

Adrian Dyer is a scientist from Australia. He helped with the study. He said that for years, scientists thought just humans and a few other animals understood how to use numbers.

However, new studies show some birds can solve problems. Spiders might be able to count, too.

Bees Have Fewer Neurons

Neurons are cells in the nervous system. They send signals through the body and tell it what to do. Cells are the building blocks of life. Each has a specific job in a living creature.

Honeybees have fewer than a million neurons. Humans have closer to 100 billion neurons. That's 12 times as many humans living on Earth.

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Still, bees can learn complicated behaviors. Sometimes, they use dance to tell each other where to find food. Bees can even recognize certain human faces.

Choose Right? Drink Delicious Sugar Water

The researchers taught and tested 14 bees during the experiment. They worked with one bee at a time.

To learn the rules, a bee first would be shown cards. Each was printed with a number of shapes. They came in two colors. It was blue if the bee was supposed to add one to the shapes on the card. If it was yellow, they needed to subtract one shape.

Then, the bee would choose an answer to the problem. It did this by flying to one of two possible solutions. If it chose well, it found itself near delicious sugar water. If it chose poorly, it would be punished. The bee would get a drink of quinine. Quinine tastes very bitter.

Tiny Brain, Big Memory

The researchers found that each bee often picked the correct answer. They were right about 7 out of 10 times.

Bees needed memory to do this. Bees have tiny brains. Still, they have a good memory. They remember things that happen both recently and a long time ago. They can use this to solve math problems.

We tend to think humans are very complicated. Other animals, especially insects, might seem more simple. However, creatures like bees can solve problems better than we think.

Bees Are Adaptable

Honeybees live complicated lives. Still, it is hard to say when they would need to add or subtract.

One possibility is that bees learned later on how to do this.

Humans never needed to play complicated music or ride surfboards, Dyer said. We are just smart. Humans have lived in many different environments and learned new things.

Honeybees might be similarly adaptable.

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Quiz

1 Which question is answered in the section "Tiny Brain, Big Memory"?

(A) How many bees were used in the study?

(B) How many neurons are in a bee's brain?

(C) How many times did the bees pick the right answer?

(D) What other insects have good memories like bees?

2 Read the section "Bees Have Fewer Neurons."

Select the sentence from the section that explains the job that neurons have.

(A) They send signals through the body and tell it what to do.

(B) Each has a specific job in a living creature.

(C) Honeybees have fewer than a million neurons.

(D) Humans have closer to 100 billion neurons.

3 Based on the section "Choose Right? Drink Delicious Sugar Water," how did quinine affect the bees in the study?

(A) Its smell helped bring the bees closer to the right card.

(B) Its smell helped the bees to stay away from the wrong card.

(C) Its bad taste let the bees know they had the right answer.

(D) Its bad taste let the bees know they had the wrong answer.

4 Based on the section "Bees Are Adaptable," WHY do scientists think that bees learned how to do math?

(A) because they are just as smart as humans

(B) because they need to know math to make complicated music

(C) because they have smaller brains than humans

(D) because they might learn new things in new environments