



# Animals Go to School

You're not the only students in the animal kingdom!  
See what other species teach their young.

For many desert meerkats in Africa, a scorpion is a tasty meal that's too important to pass up. That's because food is scarce. But a meerkat pup is too inexperienced to know how to snag a scorpion safely. Taking one on is extremely dangerous for a tiny mammal that weighs less than a baseball. For a meerkat to catch a scorpion, scientists have observed that it needs lessons from a good teacher.

For decades, scientists have wondered whether any animal species truly teach other than humans. First they had to agree on what "teaching" means. The accepted definition has three parts (see sidebar, left). Often, animals survive by acting on instinct or learning by

observation. But in rare cases, an animal will teach others. Like you, some animals go to "school."

## Hunting Lessons

Meerkats live in groups of up to 40. To teach youngsters to hunt, adults begin with an easy assignment. They bite the stinger off a scorpion and give the scorpion to the pups. The young meerkats get practice handling a live scorpion without the danger of being stung.

In these early practice sessions, the pups are not much bigger than the scorpion itself. At 3 months, meerkats weigh about 100 grams (0.2 pounds). They can fit in the palm of your hand.

As the pups' skills improve, the lessons get harder. "Increasingly, the pups get their

prey more intact," says Alex Thornton, a zoologist at the University of Exeter in England. Thornton studied meerkats in Africa's Kalahari Desert.

## Running in Pairs

So far, there have been only a few proven cases of animals teaching. Nigel Franks's discovery of teaching ants was the first in 2006. Franks is a biologist at the University of Bristol in England. He showed that rock ants, a European species, teach by running in pairs.

In this situation, one ant knows where to go. The other doesn't. That ant follows the leader, tapping the leader with its antennae as they travel. Sometimes the pair gets

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### HOW SCIENTISTS DEFINE "TEACHING"

In the animal kingdom, teaching has three parts:

- 1 The teacher must change its behavior in front of the animal that's learning.
- 2 Teaching provides no immediate benefit for the teacher.
- 3 There must be proof that the "student" actually learned.

◀ In the African desert, adult meerkats teach pups how to hunt and eat scorpions without getting stung by their dangerous venom.

SOLVING ZANKUNFLINDEN PICTURES (MEERKATS); NORASMAH BINTI BASARI (ANTS)

▶ A rock ant teaches another ant the way to the nest. It leads the way, while the follower taps it from behind to signal that it's following.



separated, so the leader waits patiently until the follower catches up. “The teacher ant is allowing the follower ant to learn at its own pace,” Franks says.

Franks suspects that the reason this species teaches is that its colonies are so small, with around 120 ants in a colony. (The colonies of other

species can have millions of members.) “Small colonies can’t afford to lose any ants,” he says.

### Bird Words

There are two species of birds that are known to teach. Blue fairywrens, an Australian bird, begin talking to their young while they’re still in eggs!



▲ Blue fairywrens teach chicks to beg for food using a special call that works like a password.



▲ Pied babblers teach chicks that food is coming with a special call. Later, they use the call to lure chicks out of the nest.

Mothers teach unhatched chicks a specific call that they’ll use to beg for food. The call works like a password. After they hatch, chicks that correctly chirp the password get more food.

African pied babblers also teach. Adult birds make a low purring sound when they deliver food to chicks. The young birds learn to expect food when they hear this noise.

As the chicks get older, adults purr to coax chicks out of the nest. Thinking there’s food, the chicks follow the adults even though there isn’t any.

The search for animal teachers

isn’t over. Scientists are studying other species for **evidence** of this behavior. “There is something **exquisite** about finding an animal that teaches,” says Franks.

—Alexa Kurzius

## EXPRESSIONS

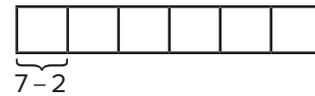
### What to Do

**EXPRESSIONS** are mathematical phrases that can include numbers or variables, and operators. Sometimes the meaning of an expression can be unclear when there are multiple operations.

**PARENTHESES** help you organize the problem-solving steps in an expression. You perform the operations within the parentheses first.

**TAPE DIAGRAMS** help you visualize what you are trying to solve.

**EXAMPLE:**  
What is 6 times the difference of 7 and 2?



- 1 First, write an expression using parentheses that represents the tape diagram.  
 $6 \times (7 - 2)$
- 2 Solve what’s in the parentheses.  
 $7 - 2 = 5$
- 3 Evaluate the rest of the expression to get your answer:  $6 \times 5 = 30$

PIED BABBLER GROUP	DESCRIPTION	EXPRESSION	SOLUTION
1	2 times the sum of 3 plus 1		8 birds
2		$(9 - 6) \times 3$	
3	3 times the difference of 10 and 6		
4	2 times the product of 2 times 2		

### Now You Try It

**1A.** The chart above describes the number of pied babbler birds in four different groups. Fill in the chart.

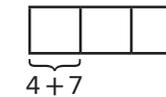
**B.** Which group has the most birds?

**2** An adult meerkat caught 8 scorpions in 1 week, 2 scorpions the following week, and then repeated this pattern over the next 2 weeks. Which expression shows the number of scorpions the meerkat caught at the end of 4 weeks?

- (A)  $(8 + 2) \times 2$
- (B)  $(8 \times 2) + 4$
- (C)  $(8 + 2) - 4$
- (D)  $8 + 2 + 2$

**3** A meerkat pup that is 45 days old will spend 4 hours a day searching for food. A meerkat pup that is 90 days old will spend about 7 more hours than the younger pup searching

for food each day. The tape diagram below shows how much time a 90-day-old meerkat spends searching for food over 3 days.



**A.** Write an expression using parentheses that represents the total time the 90-day-old pup spends searching for food.

**B.** Evaluate the expression.

**4A.** Scientist Alex Thorton gave 3 meerkat pups food for 3 days. Two meerkats got 1 scorpion each day. A third meerkat got 1 hard-boiled egg each day. How many scorpions did he need to do the experiment twice? Write an expression with parentheses.

**B.** Evaluate the expression.

**C.** A student argues that you need 18 scorpions to conduct the experiment. On a separate sheet of paper, explain his error using words and an equation.

**5A.** Let’s say you find a new ant species that has a colony 3 times the size of a typical rock ant’s, which has 120 ants. There are 2 colonies in an area. Draw a tape diagram to show how you would **calculate** the total number of newly found ants.

**B.** Write and solve an expression that represents your tape diagram from part A.

**MATH TALK:**  
How could you use number sentences to describe animal behavior?

VIDEO