

NATIONAL SCIENCE EDUCATION STANDARDS

A. Science as Inquiry

Abilities necessary to do scientific inquiry

Understanding about scientific inquiry

K–4

C. Life Science

The characteristics of organisms

- o Organisms can survive only in environments in which their needs are met.
- o The behavior of individual organisms is influenced by internal cues (such as hunger) and by external cues (such as a change in the environment).

Organisms and their environments

- o An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment.

5–8

Regulation and behavior

- o How a species moves, obtains food, reproduces, and responds to danger is based in the species' evolutionary history.

F. Science in Personal and Social Perspectives

K–4

Changes in environments

- o Changes in environments can be natural or influenced by humans.

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Written by Sophie Fern

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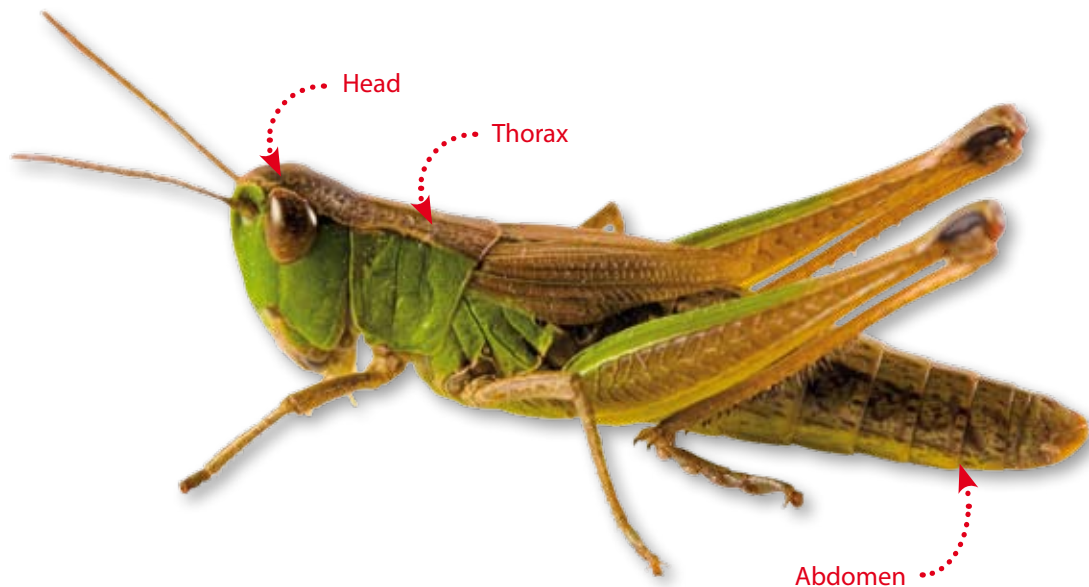
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WALKING AND LEAPING

Insects are small animals with three main **segments**.



They also have an exoskeleton—a skeleton on the outside—and six jointed legs.

exo = outside

How do insects walk on six legs without tripping up? Scientists wanted to know—because they wanted to build robots that wouldn't fall over.



Did you know that spiders, pill bugs, and centipedes are not insects? How can you tell? Try counting their legs!

Surface Tension

Here's how to see the surface tension that insects like water striders use.

You will need:

- a glass
- water
- your finger



What to do:

1. Fill the glass almost to the top with water.
2. Place the glass on a table, and wait until the water is still.
3. Touch the tip of your finger to the surface of the water and then lift it back up a little bit. Watch what happens to the water under your finger.

Share your result:

Show a friend what happens when you start to lift up your finger. Because of surface tension, the surface of the water will lift up a little, as if the water didn't want to let go of your finger! This property of water holds up water striders and other insects that don't weigh very much.

MOVING AROUND IN EXTREME TEMPERATURES

Most insects can walk, fly, and swim only at certain temperatures. However, there are a few insects that can move around in extremely cold and extremely hot temperatures.

Some beetles in Alaska, for example, have **antifreeze** in their blood. It works like the antifreeze you put in the water in a car's radiator.

There are desert ants that can **forage** when it is as hot as 140°F (60°C)! When it is this hot, though, even these tough little ants leave their **burrows** for only a few minutes at a time. This is actually a very clever trick. By foraging at the hottest time of the day, they can avoid the **predators** that have to stay in the shade.



Did you know that the hottest recorded temperature at which an insect can survive is 158°F (70°C)? This is as hot as a cup of hot cocoa. The hot-temperature champion is an ant in the Sahara Desert.

SAFETY IN NUMBERS

Many insects travel together, often in very large groups. Army ants move as a colony. They march at night and rest up in “camps.” While they rest, the queen lays her eggs. After the eggs have hatched, the worker ants put the young ants on their backs and the colony moves on.

There is safety in numbers. It is hard for a predator to pick out one individual ant to attack—and the ants can band together to attack prey as large as snakes and lizards.

A swarm of army ants on the move

