How Do Animals Grow Back Lost Parts? U-7 L-3

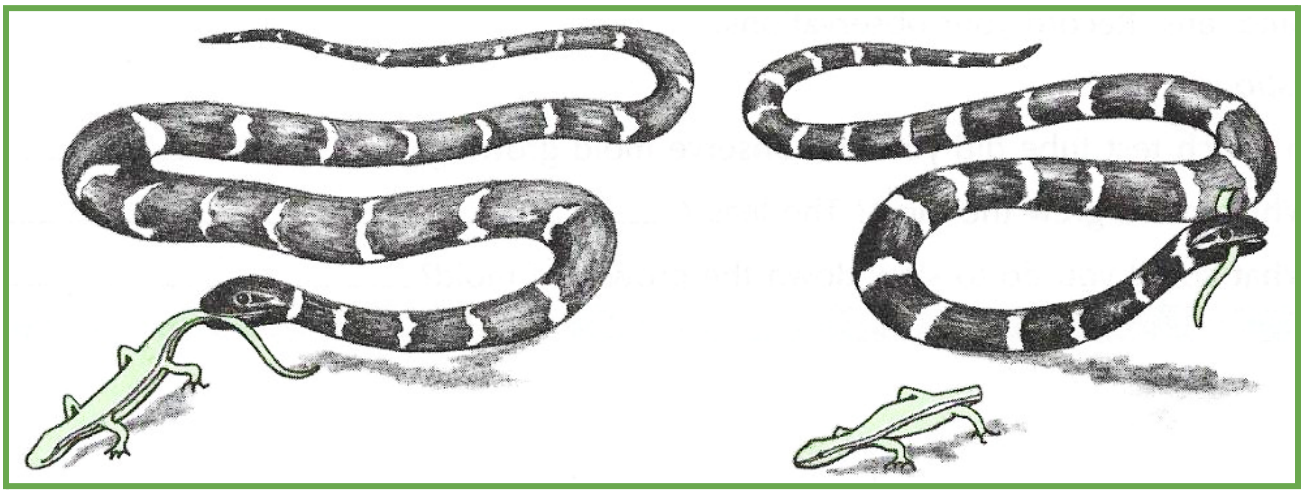
Exploring Science

A Tale Of A Lizard's Tail What good is a tail? For many lizards, a tail can be used for self-defense. When a snake or a bird attacks these lizards, the lizards' tails break off. While the predator pays attention to the tail, the lizard tries to escape. The predator may not realize what has happened until the lizard is far away. As for the lizard, it simply grows itself a new tail.

This defense works better for some lizards than others. Scientists observed how snakes react to the broken-off tails of two types of lizards. When an anole (un-NOHL-lee) loses its tail, the tail doesn't move very much. It's different for a skink (SKINGK). This lizard's broken-off tail keeps thrashing about. The more the broken-off tail moves, the longer the snake believes that it has caught the skink.

In an experiment, snakes caught many more anoles than skinks. When it comes to fooling snakes, it is good for a lizard to have a tail that not only comes off, but keeps moving.

➢ Which kind of lizards - skinks or anoles - do scientists think have a special way to store energy in their tails? Explain.



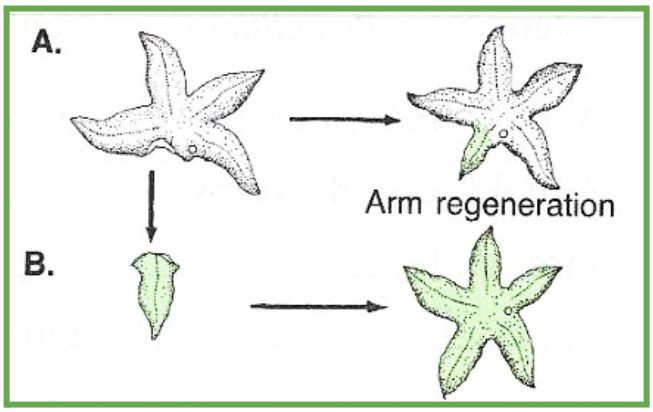
A skink escapes (and survives) while the snake focuses on the lizard's thrashing tail.

Growing Back Lost Parts

Like lizards, some other animals can grow back a lost part. This power to replace lost parts is called **regeneration** (rih-jen-uh-RAY-shun). A lizard whose tail breaks off can regenerate, or grow back, a new tail. Lobsters and crabs can regenerate lost claws.

The sea star has an unusual ability to grow back lost parts. If a sea star loses an arm, it can grow a new arm. This is regeneration. But its cut-off arm can also grow into a whole new sea star. This is a kind of asexual reproduction.

The planarian (pluh-NAIR-ee-un) is a type of flatworm. It also can reproduce asexually from a cut-off part. Cut a planarian into two, three, or even four pieces - each becomes a whole worm!



A. A sea star regenerates a lost arm.

B. An entire sea star grows from one arm and a small portion of the center. This is asexual reproduction.

What about *our* body? We can repair cuts and heal broken bones, but not much else. However, like other organisms, our body has **stem** cells. These special cells are able to grow into a *variety* of tissues that are near them.

The day may come when scientists are able to "trick" our stem cells into regenerating entire organs - such as failing hearts or kidneys! This is an exciting time to be studying regeneration!

➢ To Do Yourself

Is regeneration a form of reproduction?

You will need:

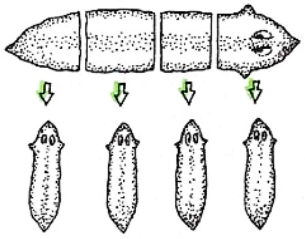
An adult to supervise the cutting; planaria; a box-cutter; petri dishes and lids; hand lens or microscope; medicine dropper; dechlorinated water or creek water

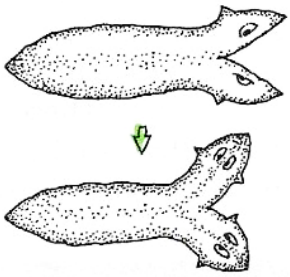
1. Use the medicine dropper to transfer at least two planaria to separate petri dishes.

2. With an adult nearby, use the box cutter to cut a planarian into one of the patterns shown. Repeat with at least one more planarian.

3. Add the dechlorinated (or creek) water to the dishes. Cover with lids and add labels.

4. Observe your planaria each day with the hand lens. Record any regeneration that you observe.





Questions

1. When is regeneration also a type of reproduction? _____

2. Is this type of reproduction sexual or asexual?_____

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I. For each statement, write **A** for regeneration or **B** for (asexual) reproduction.

1. _____ Your body makes 1 billion new blood cells each day.

2. _____ A snake grows a new skin under its old skin, and then sheds the old skin.

3. _____ A sponge animal cut into 3 parts grows into three new sponge animals.

4. _____ A deer sheds its antlers, and then later grows new antlers.

5. _____ Some sea slugs can separate their heads; the head regrows the "missing" body!

6. _____ Stem cells in a liver divide to replace liver tissue damaged during a car accident.

II. Sea stars like to eat oysters. In the past, people who gathered oysters would cut up sea stars and throw the pieces back into the water. They did this to reduce the number of sea stars. What do you think actually happened?

III. In 1996, an entire sheep (called Dolly) was copied (cloned) using its stem cells. Do you think that animals should be cloned?