



How Plants and Animals Get the Nitrogen They Need

KS4 BIOLOGY

KS3 SCIENCE

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Why Nitrogen Matters

Nitrogen is one of the most important chemicals for life. It's a key ingredient in **proteins** and **DNA**, which are the building blocks your body uses to grow, repair itself, and stay healthy. Plants need nitrogen to make green leaves, and animals need it to build muscles and bones. Yet here's the puzzle: nitrogen gas makes up **78% of Earth's atmosphere**, but plants and animals can't use it directly from the air. They need help to convert it into a form they can use.

How Plants Get Nitrogen

Plants usually get nitrogen from the **soil**. Nitrogen in soil comes in the form of **nitrates**, which plant roots absorb through water. But where do those nitrates come from in the first place? The answer involves some incredible teamwork with invisible helpers called **bacteria**.

Think of it like a factory: nitrogen gas is the raw material in the air, but it's useless until bacteria turn it into a product (nitrates) that plants can actually use.

Certain bacteria called **nitrogen-fixing bacteria** live in soil and can perform a chemical trick. They take nitrogen gas from the air and convert it into nitrates—a form plants can absorb through their roots. Some bacteria even live inside the roots of special plants like beans and clover, creating a partnership where both benefit.

How Animals Get Nitrogen

Animals can't absorb nitrogen from soil like plants do. Instead, they get nitrogen by eating plants or other animals. When you eat a chicken sandwich, you're getting nitrogen that was in the chicken's muscles—nitrogen the chicken got from eating plants or grains. This creates a chain: bacteria convert nitrogen → plants absorb it → animals eat plants → humans eat animals. Each time, the nitrogen moves up the food chain.

Think of it like passing a relay baton: bacteria start the race by converting nitrogen, plants grab it, animals eat the plants and pass it on, and humans do the same.

The Nitrogen Cycle Completes

After plants and animals die, decomposing bacteria in the soil break down their bodies and release nitrogen back into the soil as nitrates. This nitrogen can then be used by new plants, completing the **nitrogen cycle**. It's nature's recycling system, and it keeps spinning because of bacteria doing their essential work.