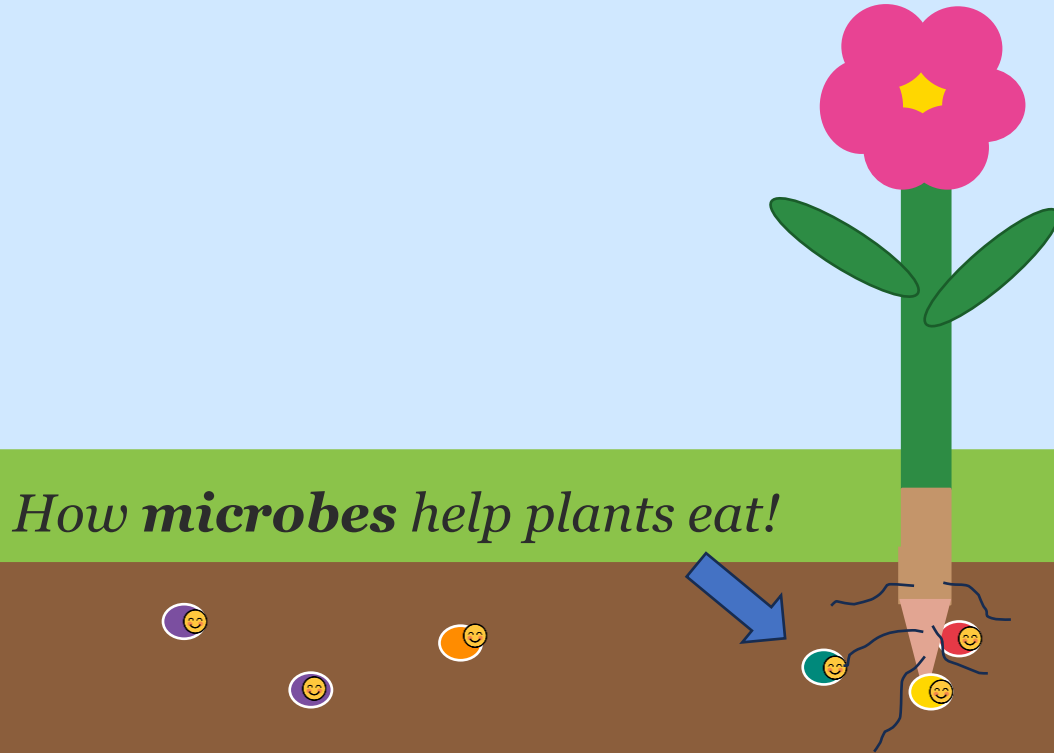
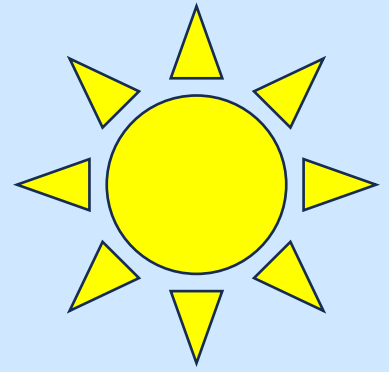


# Plants Have Tiny Friends!



*How **microbes** help plants eat!*



# What Does a Plant Need to Grow?



## Sunlight

*Energy to make food*



## Water

*To stay alive and grow*



## Air

*Carbon dioxide from the air*



## Nutrients from Soil

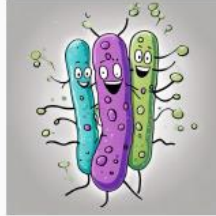
*Like food and vitamins for plants!*

**This is where their tiny friends help!**



# Microbes are **TINY** living things

Microbes are so small you need a microscope to see one cell alone!



1/1,000,000  
meters long



1 meter tall



3,500,000  
meters wide

To a microbe,  
you seem as big as  
the moon!!!

Image generation:  
<https://dreamstudio.ai/generate>



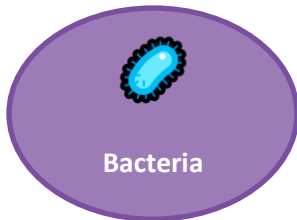
# Microbes are in the soil

There are many types of microbes  
in the soil:



## Bacteria

Tiny one-celled helpers

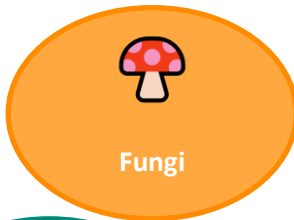


Bacteria



## Fungi

Like tiny mushrooms underground



Fungi



## Other tiny organisms

All living in the soil!



More tiny life!



## Bio-number

*One spoonful of  
healthy soil has  
MORE microbes than  
there are people on  
planet Earth!* 🌍



# The Problem: Food is Locked Up!



*The plant is hungry!  
It needs food  
to grow big  
and strong.*



Food is locked  
inside dead leaves  
and plants.  
Plants can't get it on their own!

**Think of it like...**



Food that's locked inside a  
box! You need help to open it.

That's where microbes come  
in! 

*The 'food' plants need — elements like nitrogen and phosphorous — is stuck in a form plants can't use!*



# Microbes to the Rescue!



**Dead Leaves  
& Plants**



**Microbes  
Break  
It Down!**



**Food  
Released!**



**Plant Eats  
& Grows!**



**The big idea:** Microbes are like tiny chefs! They chop up dead plants and leaves into tiny pieces that plant roots can take up. No microbes = no plant food!



# Plants and Microbes Are Friends!

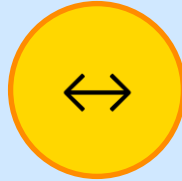


## Plant Gives...



Sugar!  
(made from sunlight)

The plant sends sweet sugar down through its roots to feed the microbes.



## Microbes Give...



Food (also called, nutrients)!  
(like nitrogen)

Microbes break down dead stuff and release food the plant can drink up through its roots.

*This is called a symbiotic relationship — they help each other! ✨*

# ★ Let's Review What We Learned!



1. Plants need food from the soil to grow.



2. Food is locked up in dead leaves and can't be used directly.



3. Microbes (tiny living things) break down the dead stuff.



4. This releases food that plant roots can eat.



5. Plants feed the microbes sugar in return — a great friendship!

**Now you know about plants and their tiny friends!** 🍌



# Learn more



## Grow a Bean!

Plant a bean seed in soil.  
Watch it grow and think  
about all the tiny microbes  
helping it!



## Compost Watch!

Put some leaves and apple  
peels in a jar with soil. Watch  
microbes break them down  
over a few weeks!



## Soil Safari!

Look at a handful of soil with  
a magnifying glass. What do  
you see? Imagine the tiny  
microbes too small to see!

***Remember: Every time you see a plant, think about its  
invisible tiny friends working underground!*** 🌍 ✨

*Presentation by Melisa Osborne (with Claude AI use for initial slide generation)*