



United States Department of Agriculture

MIGHTY MICROBE'S MINI TALE

THE UNDERGROUND ADVENTURES OF SOIL'S SUPERHEROES



Color, Read, Create
Learn and Explore!!!

Natural Resources Conservation Service



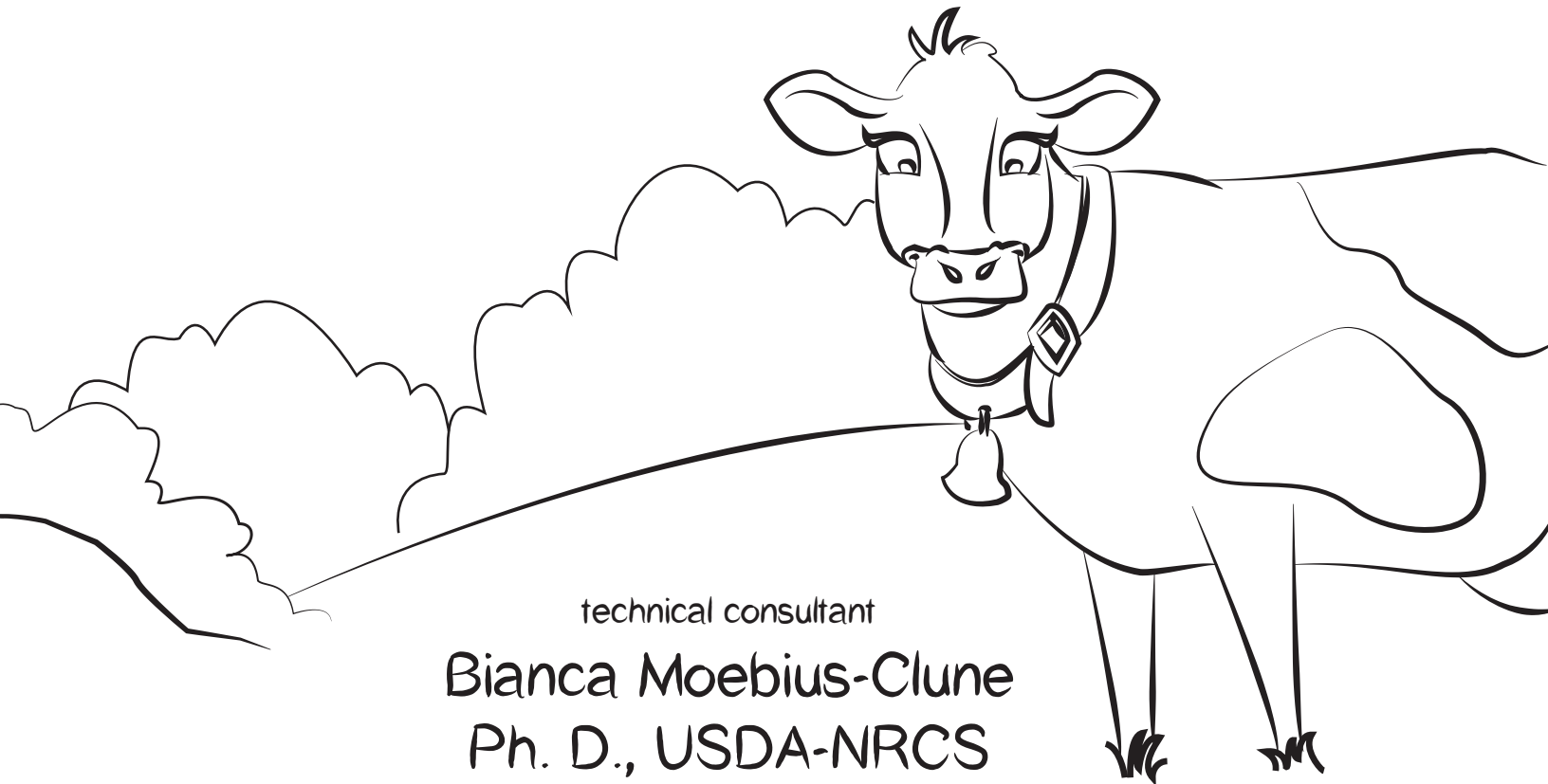


MIGHTY MINI MICROBE'S TALE

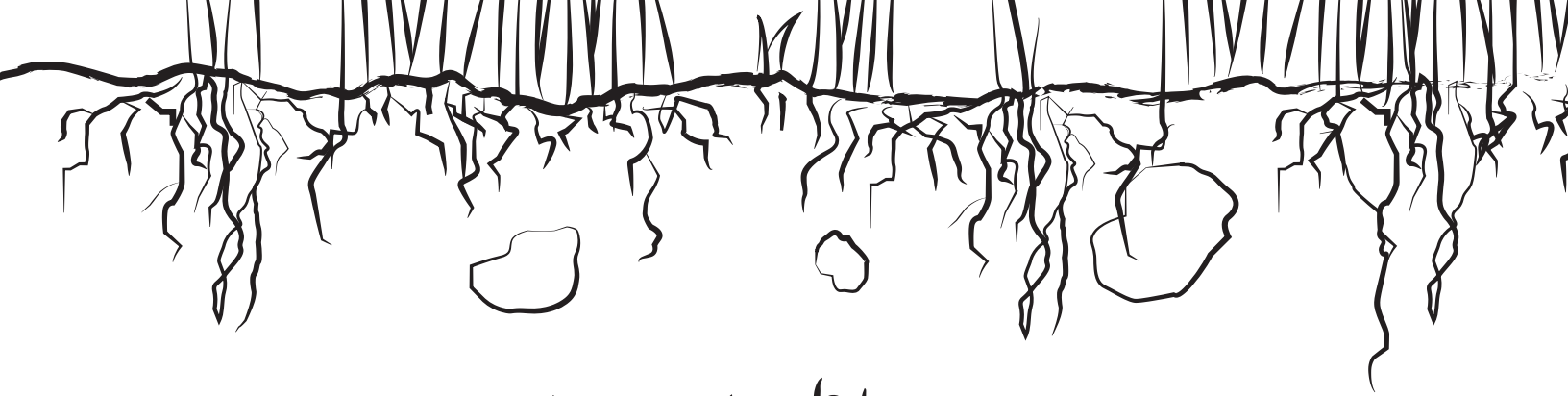
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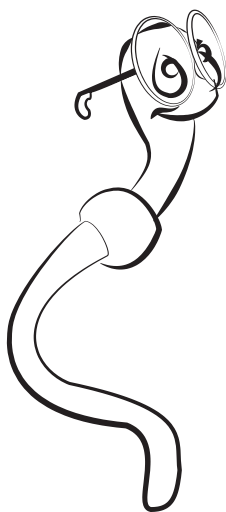
I realize you'll probably never meet me.

After all, my friends and I are far too small for you to see without a microscope.

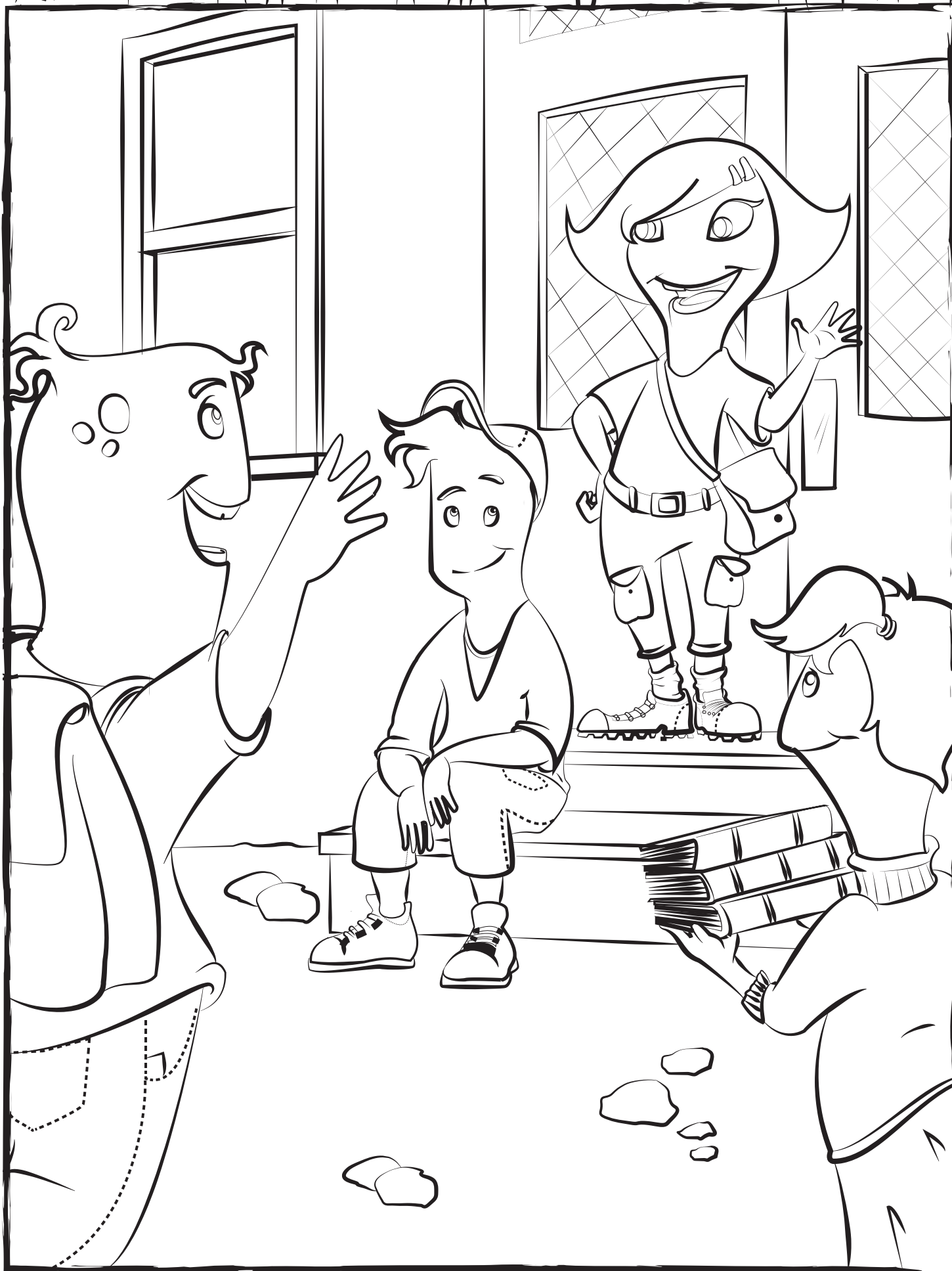
Plus, we live in a universe that is dark and hidden from view.

But just because you can't see us, doesn't mean we are not important.

Wait, where are my manners?
Allow me to introduce myself.



I'm Mini, a soil *microbe*!



Meet the Mighty Microbe



Though by the time this tale is through, you may want to call me "Mighty Mini" instead.

Why would I say such a thing? Well, believe it or not, without us, you probably wouldn't even be alive.

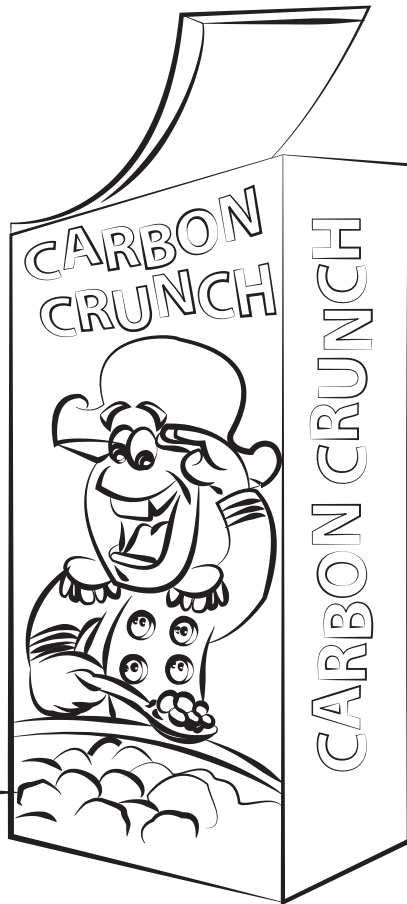
Super Soil Health Team!



Don't believe me? Let me explain by telling you some of the mighty amazing

things we soil microbes do to keep you healthy and alive.

We feed the plants....
...that feed you!



Every day, we eat the carbon that plants put in the ground and then give those plants many of the nutrients they need to grow big and strong and produce lots of healthy things for YOU to eat.

Dine in or carry out?

ROOTS RESTAURANT



Plants love what we do for them so much that some actually ooze yummy things through their

roots for us to eat and to keep us near their roots where we can give them lots of good things in return.



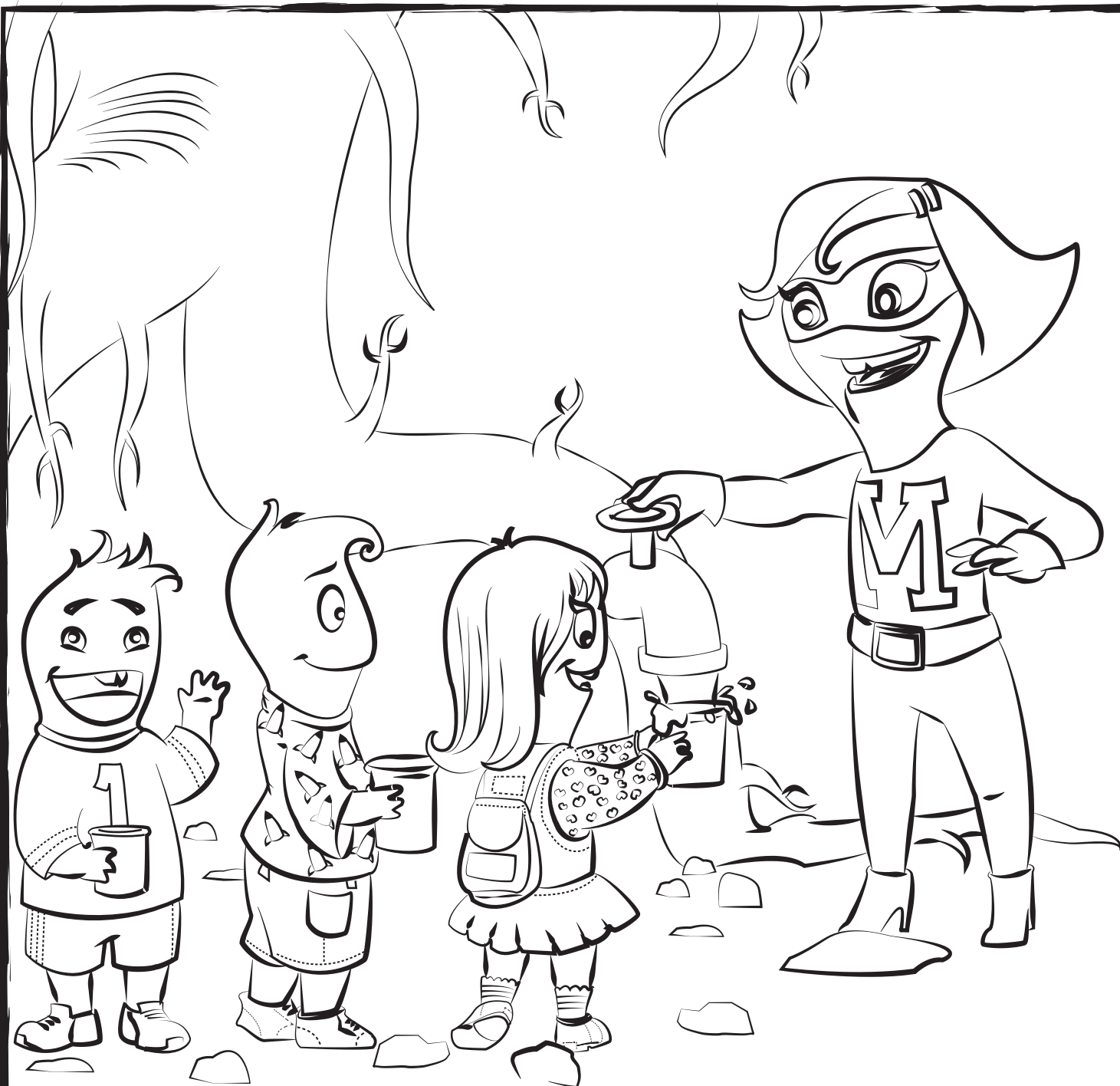
Soil pests, be gone!!!

Some of us
even help
plants fight
off pests and
diseases so our
plant friends can
stay healthy.



The mighty microbes also produce "soil glue" that holds the soil particles together — like cement holding together the bricks of a house. That way we help create pore spaces in the soil, like rooms and hallways that we all live in.

There's also space for air and water in these pores. These pores in the soil are also important for when it rains — so water can get into the soil and fill up the spaces. It gets stored there for when the plants and creatures need water later.



We get a lot of our food from plant roots. So by planting cover crops (plants that aren't usually harvested), soil health farmers make sure we get fed throughout the year. And the roots from these cover crops go deep into the soil to create more spaces for water to flow into and be stored when the rain comes, too.



Soil health farmers keep the ground covered all the time, which means our underground world is protected from the harsh rays of the sun. These covers keep our

home just the way we like it — cool and moist. Oh, did I mention that cover crops shelter our homes and keep the wind and rain from carrying off the soil?

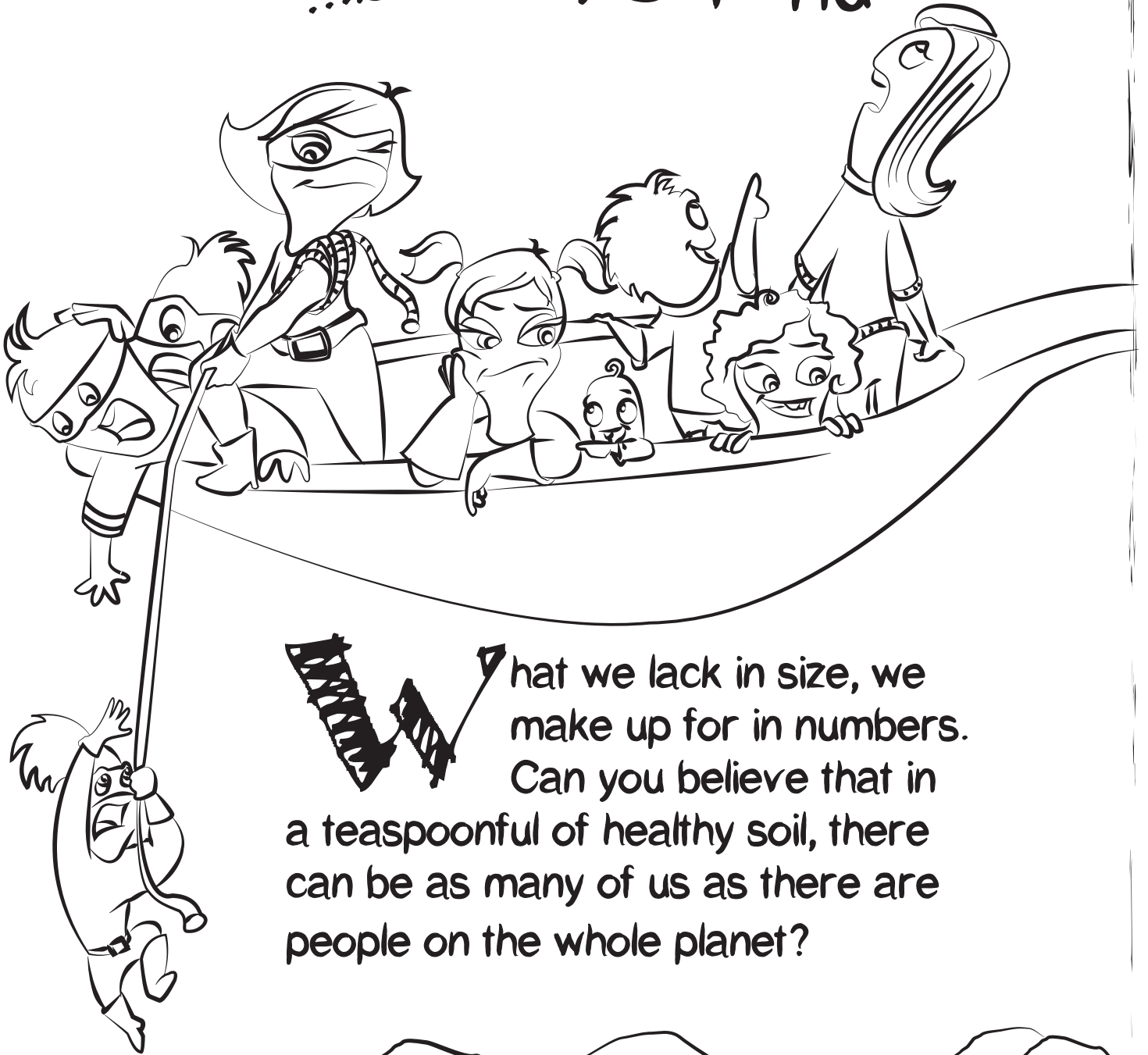
The air you breathe!

What we do to keep plants healthy

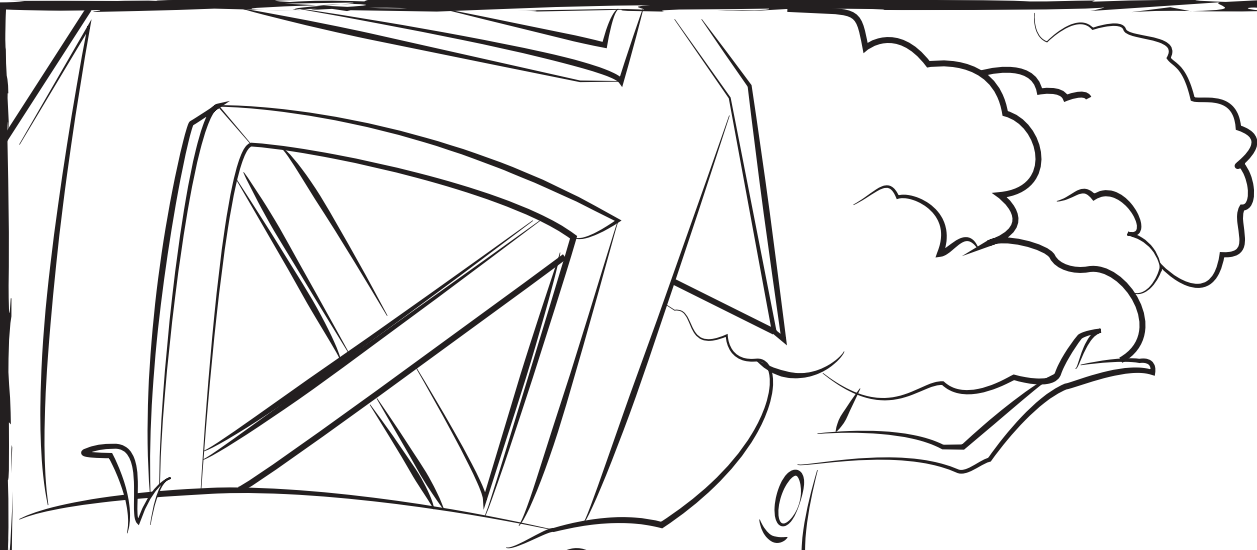
and happy helps them do what they are good at: Plants can use the energy of sunlight and carbon dioxide from the air and water from those pores in the soil and make yummy sugars! They also make oxygen that you and I need to breathe. That process is called photosynthesis. In a way, you might say that plants "breathe" in carbon dioxide and "breathe" out oxygen, which means we all have the air we need to breathe.



We're small in size...
...but **BIG** in numbers.



What we lack in size, we
make up for in numbers.
Can you believe that in
a teaspoonful of healthy soil, there
can be as many of us as there are
people on the whole planet?

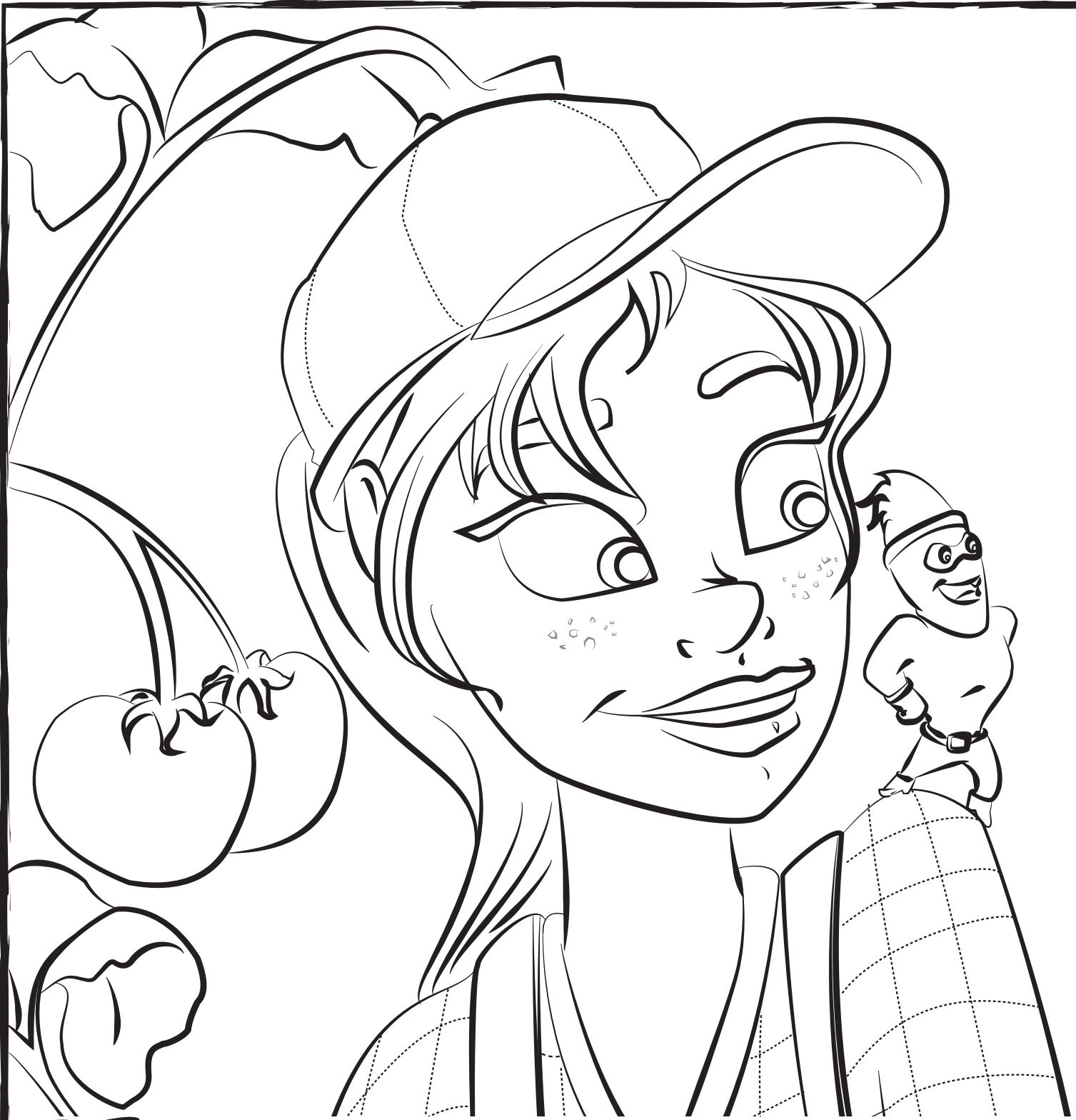


We soil microbes
do so much for you
that more and more
farmers and ranchers are learning to
farm in ways to help us help them...
which also helps you! That's why I
love soil health farmers — and you
will too after you hear the rest of
my tale.



Here's what farmers are doing
to make our lives better
and more productive.





Not all farmers are soil health farmers, but more and more of them are farming to improve soil health — and the place

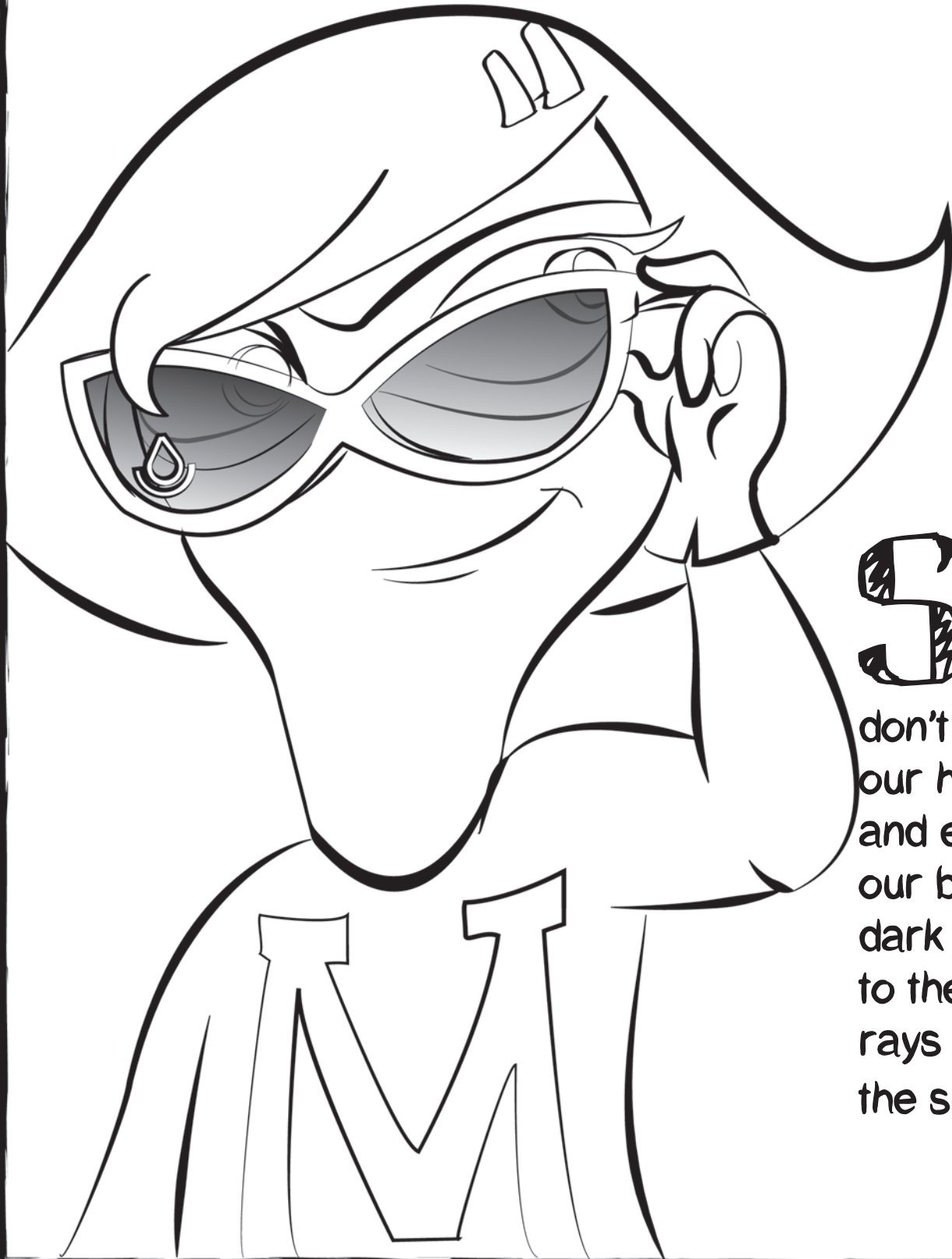
where I live. Soil health farmers don't treat us like dirt. They care for us by farming in ways that help us thrive.



These farmers know that we can help them make their farms better and help protect

their farms from disease, droughts, and floods. So of course they take care of us, wouldn't you?

DO NOT Disturb!!!



Soil
health
farmers
don't plow
our homes
and expose
our beautiful
dark world
to the harsh
rays of
the sun!

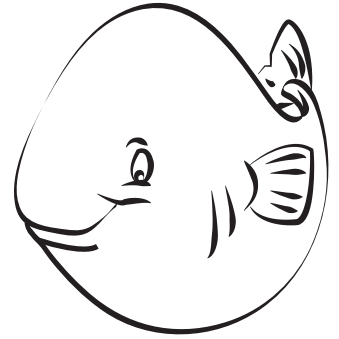
MIX it up!!!



They often use animals and other carbon sources to feed us. So there are different plants and

animals in both our worlds — above and below the ground — and we get a tasty, healthy, balanced diet.

Here's what's



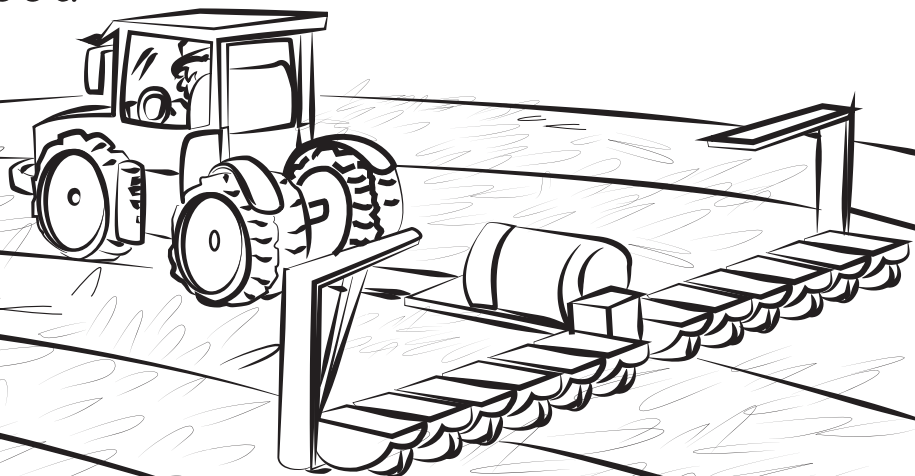
Farming in ways that protect my friends and me also helps keep our rivers, lakes, oceans, and air clean!



even cooler!!



nd because
soil health
farmers
don't disturb the
soil by plowing, they
don't use nearly as
much fuel to grow
their crops either
— which is also good
for our planet.





Thank you!!!



We soil microbes
may be small,
but with a little
help from our soil health
farmers and friends, we
can do some "mighty"
important things for
all the living things on
planet Earth.



Thank you for letting me
tell my tale. And be sure
to thank our soil health
farmers for taking care
of us all!!!



A Note from the USDA Natural Resources Conservation Service...



We hope you enjoyed reading and learning about Mighty Mini Microbe's underground adventures as you colored. Although Mini and her band of superheroes are fictional illustrations, the story about what soil microbes do for us, and why we're working with farmers to protect them, is based on science.

For decades we've been learning about all of the wonderful things soil microbes do for our plants and for our planet. Today, we know how very important they are for us, and we also know how to help them thrive as farmers grow the food we need.

But there's still a lot to learn. Perhaps one day you will become a farmer, a conservationist, or a scientist who will help discover even more soil microbes and uncover other amazing things that our underground superheroes do for the soil — and for all of us.



In this learn-as-you-color, science-based
adventure tale, you'll discover how
Mighty Mini Microbe and her
band of superheroes (with a little help from
soil health farmers and friends) help take care
of plants, people, and planet Earth.

Teachers and students can also visit:

www.nrcs.usda.gov

to download Mighty Mini Microbes
fun activity pages to discover and
learn even more about Earth's
superheroes of the soil.

