

What If?

Supporting scientific literacy with young children through connections with our Earth

By Alissa A. Lange

“At this very moment, the Earth is above you, below you, all around you, and even inside you. The Earth is everywhere. You may be used to thinking of the Earth as only the ground beneath your feet. But the water, the sea, the sky, and everything around us comes from the Earth.”

— Thich Nhat Hanh,
Love Letter to Earth

To have scientific literacy is to understand what science is, how science works, how science adds to our knowledge of the natural world, and how to use scientific findings to make decisions. Children form relationships to science early. As educators during these critical years of development, we play an important role in helping to set them on a trajectory where they will grow up with scientific literacy and *want* to further develop that literacy. In *Becoming Scientifically Literate*, Peggy Ashbrook discusses how “Children’s educational experiences and dialogue with teachers should support their understanding of scientific knowledge and prepare them to evaluate explanations from others...” (2020).

One of the ways to build scientific literacy early is to cultivate our connections to Earth. While we as educators of young children are emphasizing social emotional development, compassion for ourselves, and empathy, we can also help children to have compassion and empathy for Earth and the other creatures who live on it. We humans have a deep connection with the

Earth and the living and nonliving things on it, whether we realize it or not. By helping children to understand our connections to the Earth, we can help them care for our Earth.

CAN WE MAKE A DIFFERENCE?

It is critical to realize that, for good and bad, we humans impact our world. Young children sometimes struggle with a feeling of not having any control or impact on what happens to them (why do we *have* to put our shoes on to go to the grocery store?!) or in their relationships (why does my big sister *always* get to decide which game we play?).

As Andrew Zucker says, “Every student...will need to apply science to personal and societal issues and decisions,” (2021). We all need scientific literacy for our lives, and we can start building this sense early on, through simple activities with young children. How can we demonstrate to young children that they have an impact, good and bad, on the Earth? One place to start is with activities like those described on the next page.

But first, an illustrative interview with children:

Me: Does it matter to Earth what people do?

Five-year-old: Yeah.

Me: Like what?

Five-year-old: Like, if a person had a lot of wrappers, and filled it to the top, it go down onto the floor. So, I would help get a bag that was for the trash.

Eight-year-old’s response: Sort of. Maybe. But I can only make a small difference.

Nine-year-old: Yeah, duh. Even little things people can do matter. Like not polluting and not buying plastic.

It can be empowering to know that we humans—large and small—can lend a helping hand to the Earth (and, too, to understand that our decisions can have a negative impact) with even the small decisions that we make.

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PHOTO COURTESY OF THE AUTHOR

What If? Asking Questions and Making Observations to Connect us with Earth

KEY QUESTIONS

This set of activities centers around big questions such as, do we need to take care of our planet? Can we make a difference in caring for our Earth? The activities may align with NGSS standards, e.g., K-ESS3-3: Communicates solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

LEARNING OBJECTIVES

- Recall at least one action that we can take to care for Earth
- Explain a reason why humans need to take care of Earth, noting our interconnectedness
- Record and explain observations of the natural world

PROCEDURE

Ask children testable questions appropriate for their ages, contexts, and grades, like, *What if we threw our trash on the grass?* Set up an investigation of what might happen in the scenario.

Discuss children's ideas about what might happen if we throw plastic on the grass instead of trying to recycle it or throw it in the trash. What might happen to the grass? What about animals? If appropriate, read books or research how our trash can negatively impact wildlife. Why do we try to take care of our Earth like this? Record children's predictions.

Children take a small piece of plastic and lay it on the grass in the morning on a sunny day, with something heavy like stones to hold it down. Be sure to choose a spot that is acceptable to mess with the grass. Children can cut out a shape; in our case, the students used a triangle.

At the end of the school day, children can look underneath and make observations. It may take a week for the color to change, but children might notice that the grass is flatter. Revisit the spot for as long as possible and take photos or ask children to document observations in science journals to show change over time.

Discuss what the grass looked like, why it looked that way, and what might happen to critters who live outside if they are trying to eat the grass. Ask questions such as, do our actions matter? Should we care for our Earth? Why? Compare predictions to what they observed.

If possible, leave the plastic on the grass longer and document changes in the grass over time.

A powerful ending to the study is to ask children to figure out how to help fix the problem created by the piece of plastic. Could they take off the plastic and water the spot a lot? Could they plant new grass seed? Take care of the spot on the ground where the grass didn't do well, and see if they can

MATERIALS

- Small opaque piece of plastic or an aluminum can
- Rocks or pebbles
- Documentation materials, like science journals or tablets to take photos

bring it back to life.

Through this series of activities, children can experience for themselves how their actions *do matter*, that humans can have an impact on Earth in positive ways, and they may begin to form a stronger bond with their local environment.

EXTENSIONS

Identify safe and feasible investigations that build off of other "What ifs..." that stem from the children's interests.

Read books about caring for Earth, like *10 Things I Can Do to Help My World* by Melanie Walsh, or *Thank you, Earth* by April Pulley Sayre.

Bring in guest speakers who work in fields like conservation, who live nearby, or who are family members to hear about what they do for the planet.

Support pollinators by reading about why they are important and planting pollinator gardens or creating "bee baths."

REFERENCES

- Ashbrook, P. 2020. The Early Years: Becoming Scientifically Literate. *Science and Children* 57 (8): 18-19.
- Zucker, A. 2021. Teaching Scientific Literacy. *The Science Teacher* 88 (4): 8-9.

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