Worms: Decomposition Heroes
An exploration of earthworms
45 minutes
Ages 10-99

Context:
This program was developed as an activity for an Earth Day celebration at an elementary school. I developed the activity with the help of Shani Mink for a 20 min rotation for k-5th graders. Shani Mink contributed ideas and I took the lead after our brainstorm to design the rest of the program. We ran the activity together with every class in the school and the final version of this program takes into account our experiences and adds a Jewish element for future JOFEE educators.

This program is an introduction to earthworms and their necessary place in decomposition and soil health as well as looking deeper into cycles that renew the earth and where we see this in Jewish text. Participants will have the opportunity to explore and interact with worms in a worm bin and discuss cycles of renewal, the part worms play in decomposition and renewal, and ways the participants can work towards reconnecting to those cycles that keep the planet healthy.

Guiding Questions:
How do worms turn waste into soil? How can we think of "waste" as becoming nutritious?
Why is it important to have worms in your garden?
What is different about vermicompost compared to other types of compost?
Where do we see cycles of renewal in Judaism?
How cool is it that worm poop is soil?

Goals:
A basic understanding of how worms process waste
The parts of the worm bodies
Learners walk away thinking worms are awesome/important/necessary
Learners walk away with connecting Jewish cycles and earth's cycles

Materials:
Worm bin (preferably with many stages of decomposing material from vegetables to paper) make one a week to 2 weeks in advance (a link to worm bin making can be found in the references section)
Aluminum trays to put worms in
Tables
Magnifying glasses
A chart with a drawing of a worm and its parts labeled
Worm fun fact sheet for reference

Handwashing station or hand sanitizer

Process:

Set up: Make sure the tables are set with the trays with a scoop with plenty of stuff from the worm bin and a decent amount of worms. Make sure the worm bin is out of site or not obvious to the learners when they enter the room.

- Gather in a circle and ask: what has no eyes, arms, or legs and moves the earth? A: Worms! - *2min*
- Introduce and Play Rock, Paper, Scissors Cycle Decomposition Edition - *10 min*
    - Explain: Has anyone played rock, paper scissors evolution before? This game is like that but, with a key difference, It's a cycle. Everyone starts out as an apple (demonstrate apple pose). If you win, you move on to being soil (demonstrate soil ex: wiggle arms in front of you). Find another soil and play again. If you lose, you stay as soil, if you win you move on to being a plant (demonstrate plant movement). Find another plant and play again. If you win, you go back to being an apple. And then continue to go through the cycle
        - Apple - soil - plant
        - Play for 5 min
    - Debrief: Raise your hand if you got to be an apple 7 times/ 5 times etc. Did anyone get to be an apple more than 7 times? How does one go from being an apple in real life to being soil? Why did we choose to do this as a cycle?
- Worm Exploration: *12 min*
    - Gather learners around the table clearly instructing them not to touch anything.
    - Ask learners what they notice about the tray upon first site. Do they see any worms? Then flip the worm bin materials over so as to expose the worms and ask why they stay on the bottom of the tray.
    - Have the learners explore the worms with their magnifying glasses and hands for 2 minutes
        - Ask what do you notice? see/smell/feel
        - Turn to a neighbor and do a pair share
    - 2 more minutes to think of questions
        - What are you wondering about?
        - Share to the group
    - 2 more minutes to think about what it reminds you of
        - Share to the group
    - Share fun facts as learners' questions come up and throughout the discussion
- Worm bin and Jewish text discussion: *10 min*
    - So what's Jewish about vermiculture?

    - Take learners to the worm bin. Explain that this a worm bin (Vermicompost) and we provide them with necessary ingredients to survive, like enough dry materials like paper and wet materials like food scraps.
    - Take 1 min to notice what they see and reach to the bottom to grab a handful of mostly soil.
    - By now they should be forming an understanding of how worms produce soil and their part in cycling nutrients and food waste to produce nutrient dense soil for plants.
    - Read "dust to dust quote"- What does it mean "you were taken therefrom"? We are part of the cycle both with own bodies and with our everyday choices. Decomposition, and the death of plants and animals are important for new life to form.
    - Ask: Where else do we see cycles brought up in Judaism?
    - What do you see renewed throughout the year/in your life? What cycles do you witness throughout the year? (ie. seasons, trees dropping leaves and worms breaking them down to renew the soil for new trees to grow)
- Reflection: *10 min*
    - Now that we have discussed worms. What is the coolest thing you learned about worms today?
    - Ask them to turn to a partner and discuss these questions for 3-5 min:
        - Why are worms important?
        - How can you make choices in your own life to contribute to this cycle of dust to dust? To make sure the things you consume and use don't go to waste but are cycled to help bring new life into the world?
- If time sing the poop makes soil song
    - Poop makes soil, poop poop makes soil. Poop makes soil and soil makes (call out a vegetable) and the (vegetable) makes compost, (vegetable, vegetable) makes compost and compost makes worms poop!

Anticipated Outcomes:

- Learners will walk away with a fascination and maybe even a love of worms
- Learners will start to ask questions and think about how everything and everyone is a part of large or small cycles that renew the earth
- Learners will think about how worms interact with the world

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Background Information and Resources:

עַד שׁוּבְךָ אֶל הָאֲדָמָה כִּי מִמֶּנָּה לֻקָּחְתָּ כִּי עָפָר אַתָּה וְאֶל עָפָר תָּשׁוּב׃

"... until you return to the ground, for you were taken therefrom, for dust you are, and to dust you will return." (Genesis 3:19)

- http://www.reaps.org/compost/reproductive-system.html - the important parts to label and talk about are the clitellum, where the mouth and anus are, and the hearts. Worms are hermaphrodites, so they contain both sperm and egg and exchange genetic material with another worm
- During the exploration encourage questions about worm anatomy and how they think the worm processes its food.
- When discussing cycles and and renewal, be sure to talk about waste. Where they throw organic waste and how compost/vermiculture is one way to turn waste into soil, to be a part of contributing to healthy cycles.
- An extra question to ask during the reflection if there is enough time: What Jewish value does compost relate to?

References

- Worm Anatomy 101: The Reproductive System. (n.d.). Retrieved from: http://www.reaps.org/compost/reproductive-system.html
- Some fun facts to bring with you - Worm Facts: Interesting Things to Know About Worms. (n.d.). Retrieved from: http://extension.illinois.edu/worms/facts/
- How to make a worm bin - Fong, J & Hewitt, P. (n.d.). Six Esay Steps to Setting Up a Worm Bin. Retrieved from: http://compost.css.cornell.edu/worms/steps.html
- Poop Makes Soil (song). (n.d.). Retrieved from: https://edenvillagers.bandcamp.com/track/poop-makes-soil

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