***Meeting worms***

**Grades:** K-6 **Location:** Inside or outside **Time:** 45 mins-1hr

**Learning objectives: Life science – invertebrates, soil ecosystems, composting, observations**

**Examples of specific curriculum links:**

Grade 1:
- investigate and compare the basic needs of living things
- identify what living things provide for other living things
- describe how the things plants/animals use to meet their needs are changed by their use & are returned to the environment in different forms

Grade 2:
- observe the physical characteristics of an animal
- investigate the basic needs, characteristics, behaviour and adaptations of an animal
- identify ways in which animals are helpful to, and ways in which they meet the needs of, living things, including humans - to explain why humans should protect animals and the places where they live

**Description:** Worms are very important in the garden. Students will get a chance to hold worms and learn about them and their roles in the garden. We will also read a book about worms.

**Materials:**

- book: *Yucky Worms* by Vivian French, or *Diary of a Worm* by Doreen Cronin, or *Winnie Finn, Worm Farmer* by Carol Brendler
- a healthy worm bin/vermicomposter/worm composter (if you do not have one in your classroom, make sure you ask the teacher who does have one well in advance if you can borrow their worm bin, or create one with your class)
- spray bottle with water
- newspaper or other paper/sheet to put under the bin where students will be meeting the worms, to avoid getting too much soil in the classroom
- worm worksheets for students to work on while waiting to explore the worm bin (optional)

**Activity Description:**

- Read the chosen book to the class. This can lead into a brief discussion/revision of what worms eat, where worms live, why worms are important in the garden, etc. This can also be discussed during the worm bin exploration. (If reading *Diary of a Worm*, see fact vs fiction discussion questions below.)
- Divide the class into groups of about 6-8 students (or less). Groups will rotate through the worm bin exploration activity.
- With the students at the worm bin:
    - Questions to ask the students before opening the worm bin:
        - Why are there holes in the sides, top and bottom of the bin? *To let air into the bin; to keep the inside of the bin from getting too wet*
        - Why is there a lid on the bin? *To keep it dark inside the bin – worms do not like light. Note: many students will guess that the lid is there to make sure the worms don't escape – in fact, if the worm bin is healthy, the worms will have no reason to try to escape.*

- Before opening the worm bin, tell the students that they will get the chance to hold a worm if they would like to. Explain to them the rules for holding a worm:
    - Respect the worms: they are very helpful to our garden and all living things must be respected.
    - To hold a worm, hold your palm flat and do not squeeze your hand.
    - Do not drop the worm.
    - Do not touch the worm too much (just let it be in your hand).
    - Keep the worms' skin moist.
    - If you no longer want to hold the worm, tell the instructor and they will help you gently place it back in the bin, under the soil.
    - Make sure to wash your hands after holding the worms.
- Open the worm bin and let the students take a look. Explain to them that the shredded (news)paper is in there to keep the bin from getting too wet, and also that the worms eat the newspaper.
- Ask the students who want to hold a worm to hold their palms out flat. Spray their hands with water from the spray bottle.
    - The instructor will carefully dig through the worm bin and look for worms.
        - Tip: They are usually pretty much at the bottom of the bin. If you find a piece of partially-eaten food, there will most likely be a bunch of worms close by.
    - Once you find worms, place one in each student's hand. If their hands start to dry out, spray them with a bit more water.
- Ask the students if they can identify different parts of the worms:
    - Can they tell which end is the front and which is the back? *The front is somewhat pointier – see diagram in* Yucky Worms
    - Can they tell if it is an adult worm? *As they reach reproductive maturity, worms develop a clitellum – the wide band around its body. If it has that band, it is an adult worm.*
- After a couple of minutes, return the worms to the bin. Try to place them close to the same place as you found them, close to the food and under the soil.

**Worm facts:**

- Worms will not survive if cut in half. If only the end of their tail is cut off, it will re-grow. But if a worm is cut in half, its internal organs will be injured and the worm will die.
- Worms breathe through their skin. Their skin needs to be moist in order for them to breathe. A good question to ask students is how humans breathe, and then ask them if they know how worms breathe.
- When worms are scared, they may excrete a yellow liquid through their skin – this is not worm pee! It is a liquid that tastes bitter so that worms do not want to eat them.

- Worms are hermaphrodites. They have both male and female parts, but still need two worms to reproduce. Worms lay eggs. A fun question to ask students is to guess whether they can tell if they are holding a male worm or a female worm. Then tell them that actually worms are both a boy and a girl at the same time – most students find this pretty fascinating.
- Only adult worms have a clitellum (the wide band around their body). Having a clitellum demonstrates that a worm has reached sexual maturity.
- Worms are very useful in gardens (and for soil in general). Their casts (poop) add a lot of nutrients to the soil, and the tunnels that worms dig help water and air to reach roots.
- Worms have 5 hearts.
- The worms in the bin are most likely Red Wiggler worms, and not regular garden worms. They are smaller and very efficient decomposers.

***Diary of a Worm*** discussion questions:

- Fact vs fiction
    - Was this book factual or fictional?
    - What parts of this book were factual?
    - What parts of this book were fictional?
- What are some other facts you know about earthworms:
    - 5 hearts
    - breathe through their skin
    - like dampness
    - like darkness
    - don't have eyes
- Why do we have a worm bin? How do worms help us?
    - composting – reducing waste
    - make great soil for garden

**Worksheet ideas:**

- Venn diagrams
    - comparing worms with other compost creatures – have info sheet about variety of creatures, and they choose one to compare with the worms (legs or not, eyes or not, what they eat…)
- Waste sorting worksheet
    - compost, garbage, recycling – have list of items and they have to sort into proper category
- What do worms eat?
- Worm habitats

**Useful links:**

http://www.kidsgrowing.ca/wiki/wiki.php?n=Resources.SoilCompost  *good diagrams (Who Made All This Dirt?) and a worm quiz*
http://www.cathyscomposters.com/
http://www.cathyscomposters.com/micro/index.htm  *some great magnified videos of worms*
Worm lesson plans:
http://www.ecokids.ca/pub/teachers/resources/lesson_plans/worms/worms_natures_recyclers.pdf
http://www.ecokids.ca/pub/teachers/resources/lesson_plans/dans_ma_terre/Il_y_a_un_ver_dans_ma_terre.pdf

***Activity developed by Elin Marley for Blake Street Public School and Withrow Avenue Public School garden programmes, 2011.***