

**Urbana Park District
Anita Purves Nature Center**

NATURALIST IN THE CLASSROOM: INTESTINES OF THE EARTH

TEACHER'S GUIDE

Grades: **1st-3rd**

Program Length: **1 hour**

Focus Concept: *Invertebrates are animals without backbones. They live in a variety of ecosystems and play an important role in nature.*

Purpose

The program will familiarize students with the characteristics of two groups of invertebrates – insects and worms. The activities will assist in introducing the students to the diversity, adaptability and amazing habits of invertebrates.

Objectives: Students will

1. Define the term “invertebrate”.
2. Name at least two kinds of invertebrates.
3. List at least one role an invertebrate plays in its habitat.

Common Core Standards Correlated

Area	Strand	Standard	Standard Numbers
English Language Arts	Speaking/Listening	Comprehension/Collaboration	1.SL 1,3, 6 2.SL 1,3, 6 2.SL 1, 3, 6
English Language Arts	Language	Conventions of Standard English	1.L 1 2.L 1 3.L 1

Next Generation Science Standards Correlated

Physical Science	Life Science	Earth & Space Science
	3-LS1-1 3-LS3-1 3-LS3-2	

Illinois Learning Standards Correlated

Learning Area	Goal	Standard	Benchmark
Science	11	A	1a,1b,1f
	12	A	1a,1b
		B	1a,1b,2b

PROGRAM OUTLINE: When the Naturalist visits your site, the program will consist of the following:

- Story
- Review of various invertebrate groups
- Focus on Insects
- Focus on Worms – experiments with live earthworms

- Review/Conclusion

The activities listed below are intended to provide ideas to be used before and after the program presented by the Nature Center staff. Some are more appropriate for older or younger students. Feel free to adapt activities to match your students' level.

SUPPLEMENTAL ACTIVITIES

1. **Invertebrates In-Depth:** Give the students a quick introduction to the world of invertebrates by asking the following questions:
 - What is an invertebrate? (animal without backbone)
 - Can you list some invertebrates? (worms, insects, jellyfish and other marine invertebrates, spiders, crayfish etc.)
 - Where do invertebrates live? (everywhere!)
 - What do invertebrates eat? (other animals, plants, dead plants and animals)
 - What would it be like to be an invertebrate? Where would you live, what would you eat? What dangers would you face?
2. **Mealworm Metamorphosis:** Set up a mealworm colony in your classroom for students to observe the different stages of metamorphosis. Purchase a small amount of mealworms from a local pet store. Fill a large jar with oatmeal or bran. Add a wedge of apple or potato for the mealworms to nibble on so they can get the water they need. Place the mealworms in the jar and cover the top with a piece of screening. Fasten the screen down with a rubber band. Check the jar every few days to make sure it is moist, but not too wet.

Watch the larva closely! Mealworms remain in the larval stage for up to 4 months, so it is hard to determine when they will go into the pupal stage. The larvae will eventually change into stiff white pupae. Then they will change into black beetles (called darkling beetles). Feed the beetles small bits of raw veggies such as carrots, cornmeal and dog food. The adults will lay eggs that are very tiny, clear white and sticky. Eggs hatch within 5-12 days to start the whole cycle over.

Try these activities:

- Think of ways to find out how mealworms react to temperature changes. How are the eggs affected by temperature changes?
 - What is the average length of a mealworm?
 - Grow 2 or 3 separate colonies and feed each one something different (oatmeal, bran, dog food). Is there a difference in size, color, behavior, or rate of growth?
 - Have the kids keep “beetle books” and illustrate each stage in the beetle’s life cycle.
3. **A day in the life of...** Have the students study a chosen invertebrate and then write a story about a day in the life of that animal. Students can also create illustrations to go along with their stories. Share the stories and pictures with the rest of the class or make a book to share.
 4. **Invertebrate Hunt:** Take a walk outside and look for the following:
 - Something an invertebrate eats.
 - Something an invertebrate could live in or on.
 - Something the color of a bee, grasshopper etc.
 - Something an invertebrate has nibbled on.
 - Invertebrates themselves!

During or after the walk, make a list of all the places the children find. Did the students find more than they expected?

5. **Life in Litter:** Rake leaves into a pile, water them, and let them sit for a week or two. When you visit again, turn over the moist leaves and observe the busy, earth-making invertebrates in action!
6. **Edible Invertebrates:** Have an “invertebrate picnic” using everyday foods to imitate favorite insects, spiders and worms.
 - Make ants on a log – raisins (be sure to only use 3!) on a celery stick with peanut butter
 - Stick eight pretzel sticks into the filling (4 per side) of an oatmeal cookie snack cake to create an edible “spider”. Use frosting to add eight eyes.
 - Have the kids knead and roll small tootsie rolls into “worms”.
7. **Invertebrate Pen Pals:** Have each student select an animal to research. Next, have the students draw a name of another student in the class. Now, let the students pretend to be the animal they researched and write a letter to their new “pen pal”. Be sure they include where they live, what other animals are around and what they have done lately that’s interesting. Students can continue writing to each other throughout the year.
8. **Puppets Galore:** Let students create invertebrate puppets using old socks, felt, pipe cleaners, wiggly eyes, etc. Be creative! For example, a jellyfish can be made from an old clear shower cap with strands of plastic bag stapled to the edges.
9. **Invertebrate Know-it-Alls:** Have students write down questions they have about invertebrates. For example, can a worm smell? Does a worm have a brain? What do jellyfish eat? After the students have written their questions; give them resources to find the answers to their questions. Once all questions have been answered, compile everything into an “invertebrate know-it-all” book for the class.

(You may also wish to use your puppets and hold a talk show. Interview each of the puppets and ask questions the kids came up with.)

10. **A Rottin’ Home for Me...**After discussing how invertebrates help recycle dead plants and animals back into the soil, sing the following song.

A Rottin’ Home for Me

To the tune of “Old MacDonald Had a Farm”

I am a termite in a log,
Living peacefully.

I bore through wood and eat my fill,
A rottin’ home for me!

With a crunch, crunch, gulp!
And a crunch, crunch gulp!
Plywood, firewood,
Any kind of wood would
Suit me fine and always be
A rottin’ home for me!

Challenge the students to come up with your own lyrics to favorite nursery rhymes.

You may also wish to review the song from the Naturalist's visit:

Head, Thorax Abdomen

(to the tune of Head, shoulders, knees and toes)

Head, thorax, abdomen. 6 legs!
Head, thorax, abdomen. 6 legs!
Compound eyes and 2 antennae,
Head, thorax, abdomen. 6 legs!

11. **Pipe Cleaner Critters:** Give the students an assortment of pipe cleaners and let them create their own animals. Pipe cleaners can be wrapped around pencils (then slid off) to form a tube body for an inchworm or other insect. Attach "legs" and "antennae" to a single pipe cleaner to create a walking stick. Let your imagination go wild!
12. **Concluding Thoughts:** After the classroom visit by the Nature Center staff, ask the students to complete the following sentences.
 - The first time I saw a worm, I...
 - The first time I touched a worm, I...
 - My favorite thing about the worm was...
 - I like invertebrates because they...
13. **Other resources:** Check out these resources for more interesting ideas and stories about the world of invertebrates:

Picture Books

- *The Caterpillar and the Polliwog* by Jack Kent
- *Where Butterflies Grow* by Joanne Ryder
- *Some Smug Slug* by Duncan Edwards
- *Charlie the Caterpillar* by Dom DeLuise

Other Resources

- *Worms eat our Garbage* by Mary Appelhof, Mary Frances Fenton and Barbara Loss Harris
- *Squirmy Wormy Composters* by Bobbie Kalman & Janine Schaub
- *Incredible Insects NatureScope* by the National Wildlife Federation
- *Wonderful Worms*
- The Anita Purves Nature Center has a "Squirmy Science" Educational Loan Box available to local educators. The kit comes complete with a worm composting bin, experiments and resource books on how to set up your own classroom composting bin.

An "Insect" Educational Loan Box is also available for use. This kit contains curriculum materials, tools and activity props, posters, and a new mounted insect collection.

Call 384-4062 for further information about Educational Loan Boxes.