



NEARBY NATURE – INVESTIGATING PAVEMENT ANTS

Grade 2, Science & Technology, The Arts

Source: Adapted from *Nearby Nature Study* by Jessica Pelow, B.A, B.Ed, M.E.S, Faculty of Environmental Studies, York University

DESCRIPTION

In this lesson, students will investigate life as a pavement ant, by exploring physical and behavioural characteristics, life cycle, and habitat. The activities are designed to take place in an urban schoolyard or local habitat during the fall or spring seasons. They can be taught over the course of a week, or extended for a more in-depth exploration.

CURRICULUM LINKS - SCIENCE AND TECHNOLOGY/THE ARTS, GRADE 2

*Science and Technology, Understanding Life Systems:
Growth and Changes in Animals (2007)*

Overall Expectations: 2, 3

Specific Expectations: 2.2-2.8, 3.1-3.4

The Arts, Visual Arts (2009)

OED1. Creating and Presenting

Specific Expectations: D1.1, D1.2, D1.3

PLANNING NOTES

Background Information

Pavement ants are tiny, dark brown to black **insects** from Europe. They are known for creating small mounds of soil near pavement called **anthills**, formed when ants dig out an entrance to their underground **nest**. A pavement ant **colony** consists of a **queen** who only lays **eggs**, and many female **workers**, who **forage** for food, improve the nest, defend the nest, and take care of young ants. At certain times of the year, the queen produces winged males and females who then mate. While the males die soon after, the females fly to a new location, drop their wings and start a new colony as a queen. The queen's nest is an elaborate system of tunnels, with specific chambers for eggs, **larvae** (legless, eyeless young), **pupae** (adult-like, with antennae and legs folded against body), and food. Their diet includes dead insects, leaves, seeds, nectar, sap, and honeydew from aphids. To communicate, the ants release chemical **pheromones** from scent glands. Predators of the ants include birds, mammals, amphibians, and other insects.

Key Terms

The following terms can be found in bold. They include: insect, anthills, nest, colony, queen, eggs, workers, forage, larvae, pupae, and pheromones.

Materials

- Nature study journals - full class set
- Pencils - full class set
- Pencil crayons
- Trowels (optional)
- *Insect Photos* (Appendix 1)
- *Pavement Ant Life Cycle Puzzle* (Appendix 2)
- *Pavement Ant Inquiry Sheet and Reflection* (Appendix 3)
- *Soil Scavenger Hunt* (Appendix 4)

Learning Skills & Work Habits

Independent work, collaboration, observation, inquiry, creative thinking, critical thinking

Recommended Class Time

3-5 periods

TEACHING/LEARNING STRATEGIES

Indoor/Ignite

- 1. Whole Class:** Begin a class discussion by asking students if they have seen insects at home or in the schoolyard. Ask students to describe what those insects looked like and what they were doing. Then, have students consider why insects are an important part of a healthy ecosystem. Explain that insects help plants grow, are part of the food chain, and help make soil. Ask students if they think that insects impact their lives?
- 2. Pair Share:** Distribute or project photos of four different insects so all students can see them (Appendix 1). In pairs, ask students to identify different body parts and compare them with the human body. How are insects and humans similar and how are they different? Invite students to share their findings with the class. Explain that students will spend time investigating pavement ants.
- 3. Whole Class:** Distribute one or two puzzle pieces (Appendix 2) to each student and explain that they are going to learn more about the life cycle of an ant. Ask students to connect their puzzle piece with another student's matching piece and work together to complete the puzzle. Once the puzzles have been assembled, project an image of the completed puzzle for the class to see. Ask students to explain what they think is happening at each stage of the life cycle.
- 4. Individual Exploration:** As a class, read the *Pavement Ant Inquiry Sheet and Reflection* (Appendix 3). Ask students to fill in the blanks on the inquiry sheet only – what do they already know about pavement ants and what would they like to know about pavement ants. Invite students to examine the photo and guiding questions to help with their responses. This can be done individually, or as a whole class.

Outdoor/Explore

- 1. Pair Share:** As a class, go outside to explore soil, a pavement ant's habitat. Discuss guidelines for scientific observation, such as being quiet, careful, and respectful. Ask students why soil is important to an ant and how an ant might be important to soil. Give each pair or small group a *Soil Scavenger Hunt* (Appendix 4), it can be completed using any patch of soil. If trowels are available, students can dig up soil for more information. When the scavenger hunt is complete, ask students if they found any ants. If yes, what did the ants look like and what were they doing? Did they notice any other animals? Did they find anything unusual in the soil? If so, what did it look like?
- 2. Individual Exploration:** After examining the soil, students can record their observations in their nature study journals. If ants are present, include observations about them and whether or not their behaviour was affected by nearby humans. Emphasize the importance of including the date, time, and weather in each entry. Encourage students to use a combination of pictures and words in their observations.

Indoor/Reflect

- 1. Individual Exploration:** Using their nature study journals, ask students to create a map of the schoolyard or local habitat that marks the locations of ant mounds. If there are no mounds, ask students to predict where a queen might start a nest and mark this on the map. Encourage students to include gardens, playgrounds and trees on their map, and to name places on their map. If students complete their map, ask them to imagine what life looks like underneath the school yard and extend their map underground. They can include tunnel systems and food storage. Ask them to compare their maps with a partner.
- 2. Individual Exploration:** After investigating soil, observing ants, and drawing maps, ask students to complete their reflection sheet explaining what they learned (Appendix 3). As a class, share the reflections and create a list of new questions and things that students still want to learn.

DIFFERENTIATED INSTRUCTION

This learning activity can be adapted to meet a variety of learning styles and specific needs. Some students may need support with the reflection sheet and use a scribe instead of completing it independently.

ASSESSMENT OPPORTUNITIES

Anecdotal evidence can be collected throughout the learning activity to identify gaps in knowledge or misconceptions to ensure they are addressed. Student understanding can be assessed by examining content of their observations and/or ant artwork. Consider creating a class/group display on the pavement ant to allow students to showcase their understanding and share their information.

EXTENSIONS

Insect Hotel: Construct an insect hotel in the schoolyard, using recycled and natural materials (i.e., bricks, rugs, pine cones, straw, wood, etc.). Observe the insects visiting the hotel and create informational signs about the various guests.

Insect Field Trip: Walk or take public transit to a local meadow, forest, or wetland habitat and observe different insect species. Invite students to explore the habitat by turning over rocks and logs or observing flowers to find insects. Record observations and questions in nature study journals.

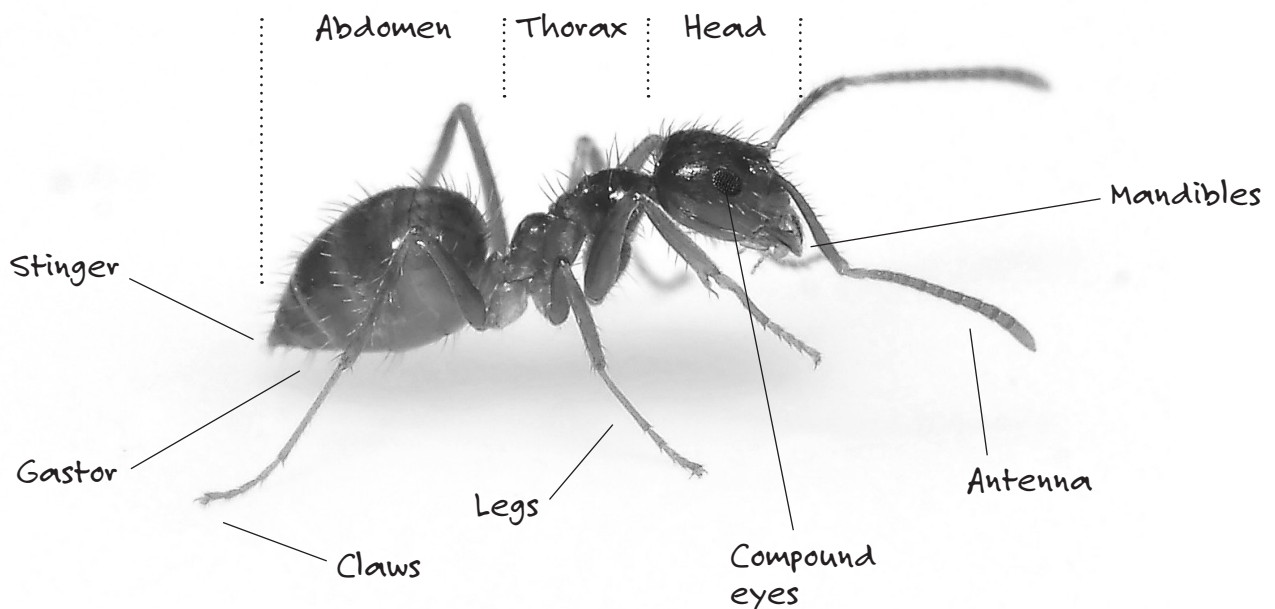
APPENDICES

Appendix 1 - *Insect Photos*

Appendix 2 - *Pavement Ant Life Cycle Puzzle*

Appendix 3 - *Pavement Ant Inquiry Sheet and Reflection*

Appendix 4 - *Soil Scavenger Hunt*





APPENDIX 1
NEARBY NATURE - INVESTIGATING PAVEMENT ANTS
INSECT PHOTOS

Photo Source: WikiCommons - commons.wikimedia.org



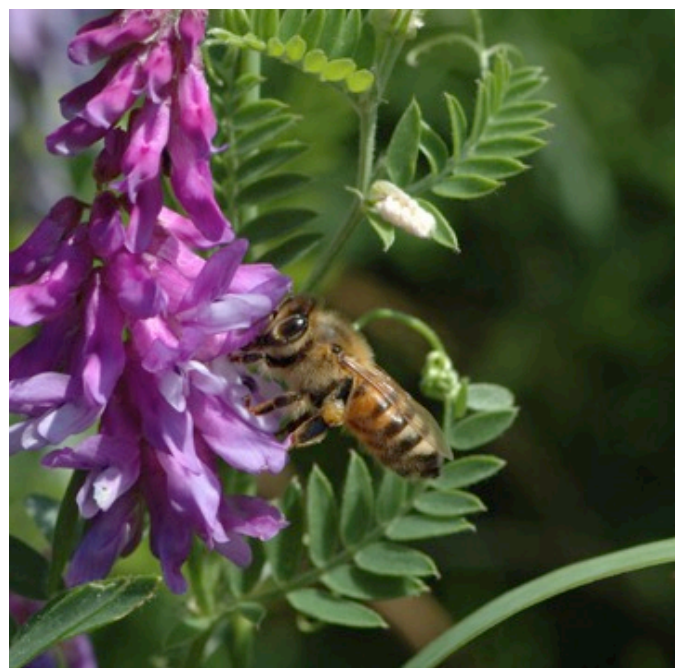
Damselfly



Katydid



Butterfly

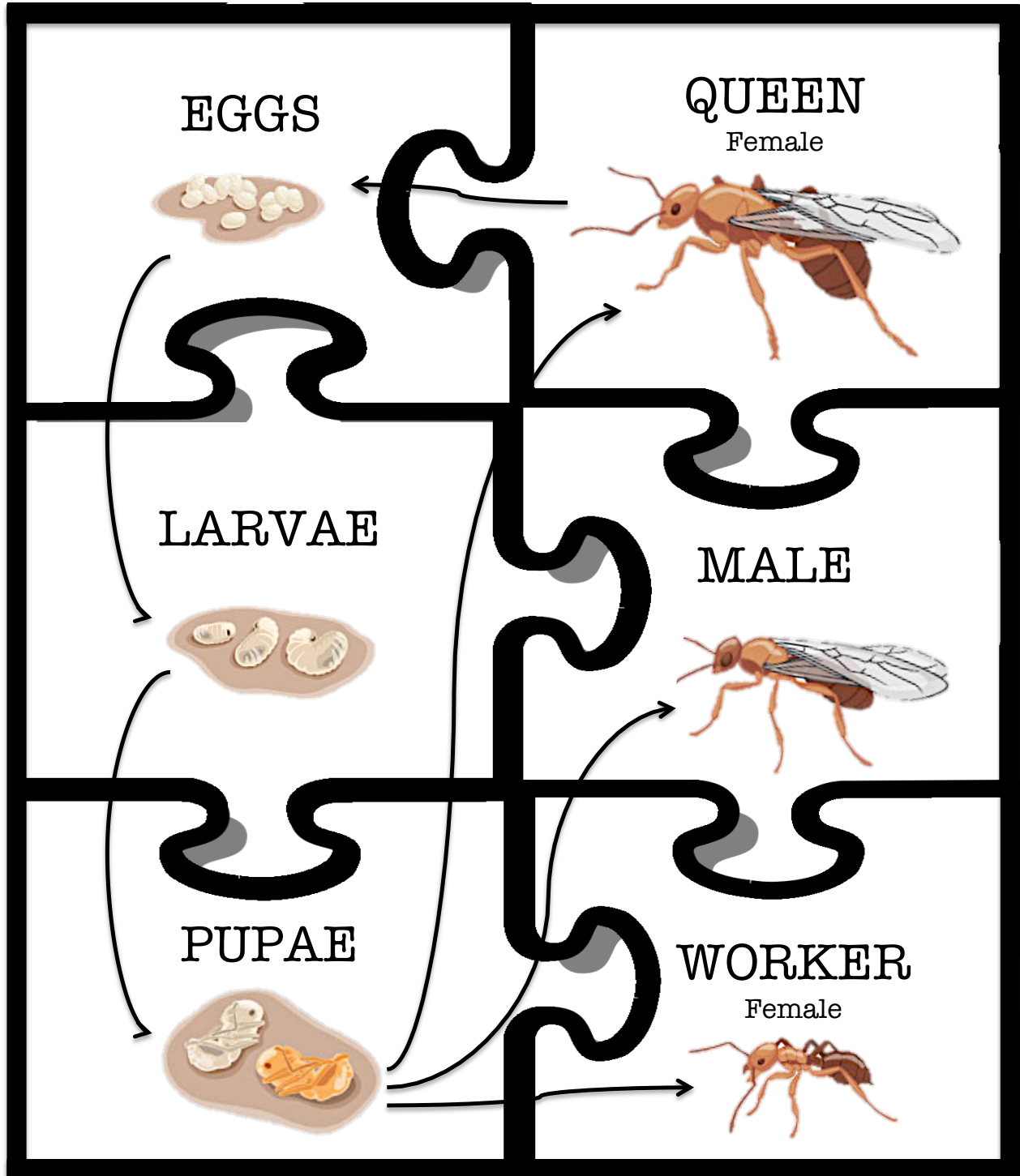


Honey Bee



APPENDIX 2
NEARBY NATURE - INVESTIGATING PAVEMENT ANTS
PAVEMENT ANT LIFE CYCLE PUZZLE

Photo Source: WikiCommons - commons.wikimedia.org and Openclipart - openclipart.org





APPENDIX 3
NEARBY NATURE - INVESTIGATING PAVEMENT ANTS
PAVEMENT ANT INQUIRY SHEET
AND REFLECTION

Photo Sources: WikiCommons - commons.wikimedia.org and Mark A. Hicks - school.discoveryeducation.com

Anthill

Where do I live?
 What do I like to eat?
 What colour am I?
 How do I protect myself?
 How do I talk to other ants?

Pavement Ant

What I know about pavement ants:

What I want know about pavement ants:

Pavement Ant Reflection

One thing I learned *about* pavement ants:

One thing I learned *from* pavement ants:

One thing I still wonder about pavement ants:

One reason I am grateful for pavement ants:



APPENDIX 4
NEARBY NATURE - INVESTIGATING PAVEMENT ANTS
SOIL SCAVENGER HUNT

Photo Sources: WikiCommons - commons.wikimedia.org and Openclipart - openclipart.org

Ants



Sand



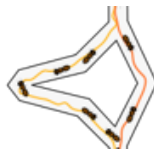
**Other
Animals**



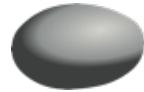
**Rotting
Wood**



Tunnels



Pebble



Roots



**Eggs,
Larvae,
Pupae**



Seeds



**Mystery
Object(s)**



**Mushroom
or Fungi**



**3 shades
of brown
soil**

