Analysis

1. Make sketches, lists, and counts of the types of organisms you have found. Then return them to the soil or compost to keep them alive.
2. Which types of organism are most abundant? If you are analyzing more than one type of sample, how do they compare? For example, in what type of sample do you find the greatest number of organisms? How about the greatest diversity?
3. Try sorting your organisms into functional groups: which ones do you think are predators, and which feed on decaying organic matter? Which group of organisms is most abundant? Sketch a food web showing possible relationships among the organisms you have found.
4. If you have access to a digital camera, you could put together an electronic presentation or picture key of the organisms you have collected.

SOIL INVERTEBRATE IDENTIFICATION SHEET

Annelids (Phylum Annelida)

Potworms (class Oligochaeta)—also known as Enchytraeids

Description: Tiny white segmented worms, 10–25 mm.

Food: Decomposing vegetation and attached bacteria and fungi.

Habitat: Damp compost or soil.

Earthworms (class Oligochaeta)

Description: Pink segmented worms, 50–150 mm. Adults have a swollen section used in mating.

Food: Decomposing vegetation and attached bacteria and fungi.

Habitat: Damp compost or soil.

Arthropods (Phylum Arthropoda)

Mites (class Arachnida)

Description: <1 mm; round body; eight legs.

Food: Some species eat organic debris such as leaf particles and rotting wood, some eat fungi or bacteria, and some are predators that eat nematodes, potworms, and other tiny organisms.

Habitat: Extremely numerous in compost piles and moist soil.

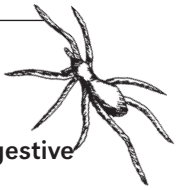
Pseudoscorpions (class Arachnida)

Description: 2–8 mm; resemble tiny scorpions, with two large pincer-like claws but without a long tail.

Food: Locate prey such as nematodes, mites, and springtails

through odor or vibrations; seize prey with powerful front claws and inject poison into victims.

Habitat: Near surface of compost or in damp leaves on forest floor.



Spiders (class Arachnida)

Description: Eight legs, up to several cm in length.

Food: Insects and other small invertebrates. Spiders inject poison and digestive juices into prey and then suck out the pre-digested body contents.

Habitat: Leaf litter and surface layers of compost.

Springtails (class Insecta)

Description: <3 mm; wingless insects with a tiny spring-like lever at the base of the abdomen.

Food: Primarily fungi and bacteria, but some species eat nematodes or detritus.

Habitat: Compost and packs of decaying leaves.

Notes: Called springtails because they catapult into the air when disturbed.

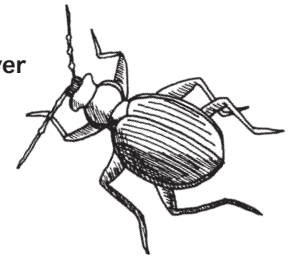
Ants (class Insecta)

Description: 5–10 mm; six legs and two short antennae.

Food: Typically eat fungi, seeds, or dead plants and animals; some prey on invertebrates.

Habitat: Found in compost during final curing phase or in surface layers of soil.

Notes: Some live in complex social structures with a queen and many workers.



Beetles (class Insecta)

Description: Hard-bodied insects with a pair of hard wings that cover softer flight wings. Common soil beetles include the rove, ground, and feather-winged beetles.

Habitat: Moist, decaying organic materials such as compost, leaf litter, and rotting logs.

Feather-winged beetles—the smallest known variety of beetles

Description: 1 mm; tiny beetles with feathery wings used for drifting in wind like dandelion seeds.

Food: Fungal spores.

Rove beetles

Description: <10 mm; usually black or brown; partially uncovered flight wings.

Food: Insects, snails, slugs, and small animals.

Ground beetles

Description: 8–20 mm; black or dark colored.

Food: Insects, snails, slugs, and small animals.

Flies (class Insecta)

Description: <10 mm; house fly larvae are soft, white, worm-like.

Food: Some types lay their eggs in decaying animals or other organic matter. The larvae, called maggots, aid in biodegradation as they feed on the decaying organic matter.

Habitat: Fruit flies, fungus gnats, and many other types of flies are common in soil and compost.

Earwigs (class Insecta)

Description: <30 mm; easily identified by jaw-like pincers at tail end.

Food: Predatory earwigs feed on insects, spiders, mites; other earwigs eat fungi, mosses, lichens, and detritus.

Habitat: Soil and compost piles.

Notes: Earwigs are active at night and hide during the day in moist, shady places.

Millipedes (class Diplopoda)

Description: 20–80 mm; cylindrical, multi-segmented body, with two pairs of legs per segment.

Food: Fungi and decaying vegetation.

Habitat: Live in and move through soil and compost.

Notes: Stink glands along their sides provide protection from predators.

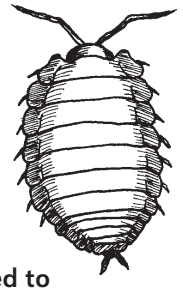
Centipedes (class Chilopoda)

Description: 30 mm; flattened, segmented body, with one pair of legs per segment. The first pair of legs is modified into poisonous jaws located below the mouth.

Food: Centipedes are predators and use poison glands in their jaws to paralyze prey such as small worms, insect larvae, insects, and spiders.

Habitat: Primarily in surface layers of compost piles and soil; require moist habitat.

Sow bugs and Pill bugs (subphylum Crustacea)



Description: 10 mm; sow bugs have short, flattened gray or brown bodies with overlapping "armored" plates and one pair of legs per segment. Pill bugs, also known as "roly-polies," roll into a tight ball when disturbed.

Food: Decaying wood and resistant materials such as veins of leaves.

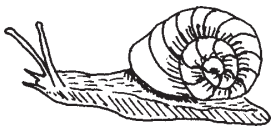
Habitat: Compost and forest floor. Need a moist habitat to avoid drying out.

Notes: Sow bugs and pill bugs are the only terrestrial crustaceans, related to lobsters and crabs.

Mollusks (Phylum Mollusca)

Slugs and Snails (class Gastropoda)

Description: 2–25 mm; snails have a brown or gray, soft, slimy body in a coiled shell; slugs are similar but with no shell.



Food: Living or decaying plants and fungi. Some snails and slugs secrete enzymes to pre-digest cellulose (most other invertebrates rely on bacteria in their guts to do this for them).

Habitat: Surface layers of soil or compost.

Nematodes (Phylum Nematoda)—also called Roundworms

Description: <1 mm; slender, unsegmented worms; cylindrical bodies with tapered ends; some are transparent.

Food: Bacteria, fungi, plant roots; some species prey on protozoa and other nematodes.

Habitat: Water-filled pores and thin films of water surrounding soil and compost particles.

Notes: Best viewed with a microscope. A handful of soil or compost could contain several million nematodes!

Rotifers (Phylum Rotifera)

Description: <1 mm; transparent microscopic creatures with a crown of hair-like cilia used for sweeping water and food into the mouth.

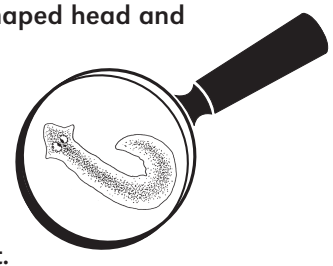
Food: Algae, decaying organic matter.

Habitat: Water-filled pores and thin films of water surrounding soil and compost particles.

Notes: Commonly found in water drained from moist soil or compost. Best viewed without a cover slip because they tend to roll up when disturbed.

Planaria (Phylum Platyhelminthes)

Description: Most are <10 mm; transparent flatworms with shovel-shaped head and two distinct eyespots.



Food: Small invertebrates, living and dead vegetation and other organic matter.

Habitat: Moist, dark, cool areas such as compost piles and rotting logs.

Notes: Commonly found in water drained from moist soil or compost.