

Beetle Races

Volume 5

TEACHER'S GUIDE

What's In Your Kit?

"Beetle Gazette" (25 copies)

Reproducible Handouts

- H1 – Scientific Observation
- H2 – Amazing Beetles Study Guide
- H3 – Beetle Race Track
- H4 – Beetle Races Data
- H5 – Beetle Races Calculations
- H6 – Adopt a Beetle (optional)

Beetle Supplies

- 6 beetles in a paper carton
- 1 zippered beetle habitat
- 6 Petri dishes with filter papers
- 6 small sorting brushes
- 1 bag of bran meal (beetle food)

You will also need a few small slices of carrot or potato and clear tape.

Easy Beetle Care

- Your beetles are a species of darkling beetle, called *superworms* or *kingworms* because their larvae are large, slender, and soft-bodied. Scientists have named the superworm species *Zophobas morio*.
- Darkling beetles thrive in a dry, dark environment and should be kept in their habitat when students are not working with them. Their natural life span is 30 to 60 days.
- Cover the bottom of the habitat with about an inch of bran. Set one or two thin slices of potato or carrot on the bran to provide all the moisture your beetles need. Replace the slices when they dry out.
- Place a crumpled paper towel in the habitat to give the beetles something to climb onto and hide under.
- Keep the habitat closed or the beetles will find a way to crawl out.

Handling Beetles: Handle the beetles gently; their legs and antennae are somewhat fragile. Use a sorting brush (provided) to sweep them into Petri dishes and onto race tracks.

Introduction

Overview

- Day 1. Students observe and read about beetles.
- Days 2, 3, and 4. Small groups plan and stage beetle races.

Time

- 30-45 minutes teacher prep
- Four 35- or 45-minute class sessions (four days); one homework assignment

Purpose

- Inspire increased interest in science.

- Allow students opportunities to practice essential science skills and calculate rates, ranges, and means.
- Teach students how to write procedures and collect, record, tabulate, and analyze data.

National Science Standards and Math Focal Points for Grade 5

- Science Standards: Abilities necessary to do scientific inquiry (observation, hypothesizing, data collection and analysis, problem solving, critical thinking)
- Math Focal Points: Developing understanding and fluency in the addition of decimals, solving problems that require attention to precision

Beetles: Basic Facts



Beetles are insects. All insects—with no exceptions—have six legs, three main body parts (head, thorax, abdomen), and an exoskeleton. These three features distinguish them from all other animals.



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Beetle larvae look much different than adult beetles.

Two facts together set beetles apart from other insects.

1. They have a pair of hard forewings, called **elytra** (ee-LIE-truh), that protect a pair of soft, fragile hind wings.
2. They go through a **complete metamorphosis**, including egg, larva, pupa, and adult.

(Many other kinds of insect go through only a simple or incomplete metamorphosis.)

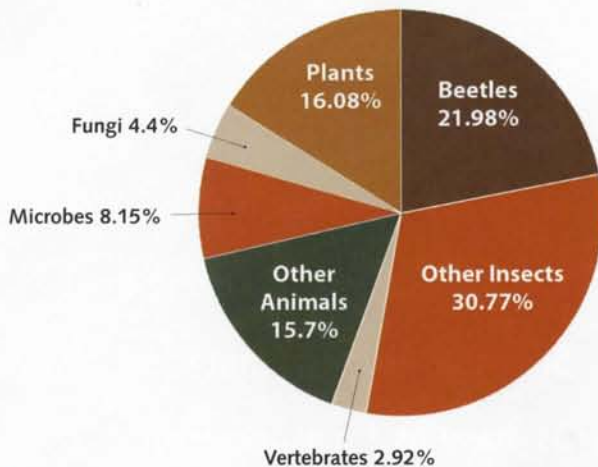
Beetles live in all ecosystems and are distributed throughout all of the world's continents, except Antarctica. They eat smaller insects, bugs, snails, slugs, fungus, or plants. Many beetles are scavengers or decomposers: they eat waste, including dung, dead animals, and decaying plant material.

Hypermetamorphosis

Blister beetles go through a five-stage complete metamorphosis that includes two different larval forms: egg, larva one, larva two, pupa, adult. Larvae in stage one look different and eat different food than larvae in stage two.

Evolutionary Champions!

Scientists have named 1.6 million species of animals, plants, fungi, and microbes, including more than **350,000 beetle species**. Beetle species make up 42 percent of insect species and 22 percent of the total species on Earth.



Because there are so many kinds of beetle, some scientists speculate that they may have a special “evolutionary edge”—a characteristic that makes them more than just survivors. They may be the all-time champions of evolution, based on their ability to evolve and adapt to conditions in almost any environment.

Every year, more species are added to an official list, called the “Species 2000 Catalog of Life.” Some scientists think there may be as many as 12 million species, **7 million** of which would probably be beetles!



Scientists call beetles **coleoptera** (cole-ee-OP-tur-uh), which m

Name _____

Date _____

BEETLE RACES DATA

HYPOTHESIS: Which distance will the darkling beetle run at a faster average speed, the short or the long? Or will the speeds be the same? Answer with a complete sentence.

SHORT DISTANCE _____ cm

Trial	Time (seconds)	Speed (distance/time)	Speed (decimal)
1			cm/sec
2			cm/sec
3			cm/sec
AVERAGE = Total Speed (decimal) ÷ 3			cm/sec

LONG DISTANCE _____ cm

Trial	Time (seconds)	Speed (distance/time)	Speed (decimal)
1			cm/sec
2			cm/sec
3			cm/sec
AVERAGE = Total Speed (decimal) ÷ 3			cm/sec

RANGE: Of the six trials, which was the slowest speed (decimal) and which was the fastest speed (decimal)? This is the range.

SLOWEST _____ cm/sec FASTEST _____ cm/sec