

SCHEDULE

September	Living Things and Animal Overview
October	Invertebrates Introduction
November	Porifera, Cnidaria, Echinoderms, Worms
December	Mollusks
January	Mollusks
February	Arthropods (not including insects)
March	Insects
April	Insects
May	Insects

GENERAL BOOKS

The following resources will be used throughout the year – as spines and as a frequent source of activities.

Introduction to Biology: A Study by John Holzmann [OWN]

A thorough introduction to most of the plants and animals of the world: how they are classified and how they live. Discusses from a biblical perspective some of the problems with modern taxonomy

Backyard Pets: Activities for Exploring Wildlife Close to Home (Carol A. Amato) [OWN]

Focuses on the insects, birds, amphibians, and other animal life found in many backyards and provides instructions for catching, caring for, studying and releasing those that are safe to touch.

DK First Animal Encyclopedia: A First Reference Guide to the Animals of the World (Penelope Arlon) [OWN]

Describes the animal world in five sections: mammals, birds, reptiles and amphibians, "creepy-crawlies," and fish.

The Usborne Complete First Book of Nature (Usborne) [OWN]

This combined volume contains the following titles: Birds, Butterflies, Creepy Crawlies, Fish, Flowers, Trees, and Wild Animals.

Animals without Backbones (Evan Moor) [OWN]

This book, designed with good science and easy teaching in mind, covers these concepts:

- animals without backbones are called invertebrates
- invertebrates are classified by their body characteristics
- most kinds of invertebrates live in the ocean
- invertebrates have different ways of acquiring food
- invertebrates' movements match the animals' needs
- invertebrates have many forms of self-defense
- some invertebrates build homes

Samples of the hands-on learning experiences:

- observe and record information about invertebrates -- spiders, ants, earthworms, snails
- examine shells and exoskeletons of ocean invertebrates
- raise mealworms to observe a complete metamorphosis
- experiment to find out what kind of foods ants prefer

Bugs to Bunnies (Kenneth W. Goin) [OWN]

Includes: Insects, Spiders, Amphibians, Reptiles, Fish, Birds and Mammals. For each chapter there are characteristics of the animal, diet, defenses, habitats, reproduction and a featured animal.

This book is full of reproducibles, arts and crafts ideas and experiments.

LIVING THINGS

All living things:

Need food and water
Breathe
grow and change
can have babies

Sort pictures from pages 13-14 of *Bugs to Bunnies* according to living or non-living.

ANIMAL VS. PLANT

Read aloud “Animals and Plants” poem (from *Bugs to Bunnies* by Kenn Goin)

Animals are living things,
They move from place to place,
They have to find the foods they eat,
And it’s a lifelong chase.

Plants are living things,
Their roots are in the soil,
The food they eat they make themselves,
They cannot move at all.

Sort pictures from page 12 of *Bugs to Bunnies* according to plant or animal.

ANIMAL NEEDS

Watch **All about Animal Needs (Schlessinger Media)** and complete Teacher’s Guide. [591.5 A416]

Learn the different ways by which animals fulfill their needs of air, food, water and shelter.

Magic School Bus Gets Cold Feet: A Book About Warm and Cold-Blooded Animals

ANIMAL LIFE CYCLES

Individual animal life cycles will be studied when studying each animal.

All about Life Cycles (Schlessinger Media) and Teacher’s Guide. [591.56 A416]

From tadpole to frog, egg to ostrich and cub to lion, children will learn about average animal life spans, the different stages of development and the role of reproduction.

Life Cycles (Michael Elsohn Ross) [Y571 R825L]

Illustrated stories of the life cycles of a sunflower, a mushroom, and a grasshopper show how life continuously renews itself in different ways.

FOOD CHAINS/WEBS

All about Food Chains (Schlessinger Media) and Teacher's Guide. [577 A416]

Students will take a look at examples of various food chains, identifying the difference between producers, consumers and decomposers.

What Eats What? Food Chains and Food Webs (Patricia Lauber) [Y591.53 L366W]

Explains the concept of a food chain and how plants, animals, and humans are ecologically linked.

Complete various worksheets and sorting to reinforce concept.

VERTEBRATE VS INVERTEBRATE

Basics:

Explain the difference between vertebrates vs. invertebrates.

Introduce these main invertebrate groups:

- sponges
- cnidaria
- echinoderms
- worms
- mollusks
- arthropods

Benny's Animals and How He Put Them in Order (Milicent E. Selsam) [OWN]

The reader follows Benny, a young boy, as he learns about the characteristics of living things and classifying invertebrates and vertebrates.

Look Closer (Brian Wildsmith) [OWN]

A closer look at walls, fences, grass, and flowers reveals ladybugs, ants, and other invertebrates that inhabit our world. A far simpler book on invertebrates.

A First Look at Animals without Backbones (Milicent E. Selsam) [OWN]

An introduction to the characteristics of the major groups of invertebrates.

Animals without Backbones (Evan Moor) [OWN] – Reproducible Book

This reproducible workbook teaches these concepts:

- animals without backbones are called invertebrates
- invertebrates are classified by their body characteristics
- most kinds of invertebrates live in the ocean
- invertebrates have developed different ways of acquiring food
- invertebrates' movements match the animals' needs
- invertebrates have developed many forms of self-defense
- some invertebrates build homes

PORIFERA

Vocabulary:

- epidermis the layer of cells that covers the outer surface of the sponge. The thin, flattened cells of the pidermis are called pinacocytes.
- holdfast root-like tendrils that attach the sponge to rocks.
- osculum the large openings in a sponge through which water flows out of the sponge. Sponges may have more than one oscula.

Sponges look like plants, but they're animals.

Sponges are very simple animals that live permanently attached to a location in the water.

Most sponges live in salt water.

The body has thousands of pores which let water flow through it continually. Sponges obtain food and oxygen from this flowing water. The flowing water also carries out waste products.

They range in size from a few millimeters to 2 meters tall.

Projects/Field Trips:

Label sponge diagram.

Look at sponges at the Virginia Aquarium.

Sponges are Skeletons (Barbara Juster Esbensen) (*Let's-Read-and-Find-Out Science Book*)

Time to squeeze a skeleton! It's bath time, and your sponge is actually the skeleton of an animal that lived under the sea. Read on to find out how sponges use their special holes and tunnels to eat and breathe, and how you use these same holes and tunnels to soak up the water and rinse off the soap.

Sponges (Science Under the Sea) (Lynn M. Stone)

Describes the physical characteristics, behavior, and habitat of these plantlike sea animals.

CNIDARIA

Examples are: corals, jellyfish, hydra and sea anemones.

All cnidarians are carnivores.

All have unique stinging cells nematocysts, usually located on the tentacles, that spear and paralyze their prey.

Coral is actually lots of tiny animals stuck together. They too look like plants.

Sea anemones look like pretty sea flowers, but they too are animals.

Projects/Field Trips:

Study live hydra sample from Home Science Tools; study at coral samples from Hawaii; study cnidaria at the Virginia Aquarium.

Jellyfish (Martha E. H. Rustad)

Simple text and photographs describe the physical characteristics and behavior of jellyfish.

Jellyfish (L. R. Taylor)

Describes the life cycle, habitat, behavior, and physical structure of the soft-bodied sea animal that has no brain or bones.

Goey Jellyfish (Natalie Lunis)

Text and photographs present amazing facts about jellyfish.

Sea Anemones (Lola M. Schaefer)

In simple text and illustrations, describes the sea anemone.

Coral Reefs (Sylvia Earle)

(Jump into Science)

Explains the formation of coral reefs and provides information about the conditions needed for survival.

Coral Reef (Kate Scarborough)

(Watch it Grow)

Follows the step-by-step process of the growth of a coral reef. Features step-cut pages to emphasize the way things get bigger as they grow.

It Could Still be Coral (Allan Fowler)

(Rookie Read-About Science)

OWN

Describes the physical characteristics and behavior of coral polyps and describes what coral reefs are like and how they form.

ECHINODERMS

Echinoderms are spiny-skinned invertebrates that live on the ocean floor.

The word echinoderm means "spiny skin."

No echinoderms are found in fresh water.

Echinoderms are armored animals that have a hard exoskeleton.

Examples are: sea stars, sea cucumbers, sea urchins, and sand dollars.

Projects/Field Trips:

Look at samples we own.

Look at echinoderms at the Virginia Aquarium.

Spiny Sea Stars (Christine Zuchora-Walske)

Simple text and photographs introduce the physical characteristics, behavior, and habitat of the sea star.

A Sea Star (Anne Miranda) **OWN**

Stars of the Sea (Allan Fowler) *(Rookie Read-About Science)* **OWN**

Starfish (Edith Thacher Hurd) *(Let's-Read-and-Find-Out. Stage 1)*

A simple introduction to the appearance, growth, habits, and behavior of starfish.

Starfish: The Stars of the Sea *(Hello Reader Science Level 1)* **OWN**

Starfish (Rebeca Steffoff)

Text and photographs introduce some of the 3600 kinds of starfish.

Prickly sea stars (Natalie Lunis)

Text and photographs present amazing facts about sea stars.

Sea Stars (Lola M. Schaefer)

Simple text and photographs introduce sea stars, their appearance, and behavior.

Sea Urchins (Jason Cooper)

A simple introduction to the physical characteristics, life cycle, and habitat of sea urchins and related species.

WORMS

Worms

There are three types of worms: flat worms, round worms and segmented worms. We are most familiar with the segmented ones.

Worms live where there is food, moisture, oxygen and a favorable temperature. If they don't have these things, they go somewhere else.

In one acre of land, there can be more than a million earthworms.

The largest earthworm ever found was in South Africa and measured 22 feet from its nose to the tip of its tail.

Worms tunnel deeply in the soil and bring subsoil closer to the surface mixing it with the topsoil. Slime, a secretion of earthworms, contains nitrogen. Nitrogen is an important nutrient for plants.

Worms are cold-blooded animals.

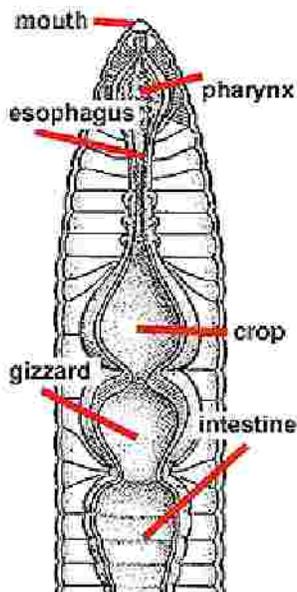
Worms can grow a new tail, but not grow a new head if they are cut off.

Baby worms are not born. They hatch from cocoons smaller than a grain of rice.

Even though worms don't have eyes, they can sense light, especially at their anterior (front end). They move away from light and will become paralyzed if exposed to light for too long (approximately one hour).

If a worm's skin dries out, it will die.

Worms can eat their weight each day.



Body Parts

Wendell the Worm, Ace Reporter here with the inside story on the great creatures known as worms. Let's follow a leaf through my body to see how I eat and digest it. Earthworms have mouths, we can even open them wide to fit leaves and other good things. But we don't have teeth! Here is what happened to my lunch:

Pharynx: I push my pharynx or throat out of my mouth to grab leaves and to pull them back into my mouth. Then I get them nice and wet with my saliva.

Esophagus: Once I have my food good and wet, I push it down my esophagus, then onto my crop.

Crop: My crop is a storage compartment for my food and other things I swallow. From the crop, my lunch goes to my gizzard.

Gizzard: My gizzard is where the work happens. I use any stones that I've swallowed and the strong muscles of my gizzard to grind up the leaves. These muscles work almost like teeth.

Intestine: Once I have the leaves all ground up they move to my intestine where the digestive juices break them down even more.

Bloodstream: Now that the leaf is all digested, some of it will pass into my bloodstream.

Anus: Whatever is leftover comes out my anus as castings or worm poop.

Projects/Field Trips:

Backyard Pets: Activities for Exploring Wildlife Close to Home: Complete pages 30-41 including investigations.

Watch baby earthworm being born here:

<http://yucky.discovery.com/flash/worm/multi/wormbirth.mov>

And watch heartbeat video here:

<http://yucky.discovery.com/flash/worm/multi/heart.mov>

Learn about various worms from this website:

<http://yucky.discovery.com/flash/worm/index.html>

Wiggling Worms at Work (Wendy Pfeffer) (*Let's-Read-and-Find-Out Science. Stage 2*)

Explains how earthworms eat, move, and reproduce and how they help plants to grow.

Wonderful Worms (Linda Glaser)

Describes the physical characteristics, behavior, and life cycle of the common earthworm.

Worm (Jill Bailey) (*Heinemann First Library – Bug Book*)

A simple introduction to the physical characteristics, diet, life cycle, predators, habitat, and lifespan of worms.

MOLLUSKS

Mollusks are a phylum of soft-bodied invertebrate animals.

Many mollusks have a hard external shell, but others do not.

Examples are: bivalves (like clams), cephalopods (like octopuses and squids), and gastropods (like snails and slugs).

Projects/Field Trips:

Backyard Pets: Activities for Exploring Wildlife Close to Home: Complete pages 7-17 including investigations.

Label snail diagram.

Sort actual shell samples – bivalve vs gastropods. Identify them with a field guide.

Look at mollusks at the Virginia Aquarium.

The Usborne Complete First Book of Nature (Usborne) [OWN]

Read pages 160-161.

About Mollusks: A Guide for Children (Cathryn P. Sill)

In simple, easy-to-understand language children learn what mollusks are, how they look, how they move, what they eat, and where they live. The beautifully detailed, full-color illustrations reflect the vast diversity of the mollusk population—from a sixteen-foot long Giant Pacific Octopus to an eight-inch Banana Slug—and present each in its natural habitat. The afterword, which provides details on the mollusks featured, will inspire young readers to learn more.

Slugs and Snails

Slugs and Snails (Terry J. Jennings)

A simple introduction to slugs and snails. Shows several simple experiments children can do to study the behavior of slugs and snails.

Snail (Karen Hartley)

A simple introduction to the physical characteristics, diet, life cycle, predators, habitat, and lifespan of snails.

Shellfish

A First Look at Seashells (Millicent Ellis Selsam)

An introduction to seashells, explaining how they are classified and describing the differences that distinguish one kind of seashell from another.

Shellfish Aren't Fish (Rookie Read-About Science) OWN

Provides information about oysters, clams, scallops, and mussels--sea animals that live in shells.

Pearlie Oyster: A Tale of an Amazing Oyster (Suzanne Tate) OWN

Discovering Seashells (Douglas Florian)

An introduction to various kinds of seashells, where they can be found, and their inhabitants.

Cephalopods

An Octopus is Amazing (Patricia Lauber) (Let's-Read-and-Find-Out Science1) OWN

An introduction to one of the curiosities of the sea--the multi- tentacled, highly intelligent octopus.

Gentle Giant Octopus (Karen Wallace)

Describes the physical characteristics and behavior of a Giant Octopus and how she searches for a home at the bottom of the ocean, lays her eggs and protects them from predators until they can hatch.

Meet the Octopus (Sylvia M. James) OWN

Octopus Under the Sea (Connie Roop) (Hello Reader Science Level 1) OWN

This Level 1 Hello Reader! Science title is filled with basic facts and rhyming text. Young readers will learn all about these many-legged sea creatures, such as where they live, what they eat, and what they do to survive.

ARTHROPODS – CRUSTACEANS (lobsters, crabs, shrimp, barnacles, pill bugs)

About Crustaceans: A Guide for Children (Cathryn P. Sill)

Describes the anatomy, behavior, and habitat of various crustaceans, including the lobster, crab, and shrimp.

Pill bugs (Monica Hughes)

Children love getting a close-up look at fascinating creatures in the world around them. This series allows them to get up-close and personal with some of these creepy creatures that they can find in parks, gardens, and even their own home. Each book identifies the main physical features of each bug including what they eat, how they change, and how they reproduce. Chapters include: Pill bugs -- Kinds of pill bugs -- Looking at pill bugs -- Pill bug parts -- Looking for pill bugs -- Hatching -- Growing -- Food for pill bugs -- Pill bugs in danger! -- Pill bugs in winter.

Pillbugs (Donna Schaffer) [Life Cycles]

Describes the physical characteristics, habits and stages of development of one kind of isopod, the pill bug.

I'm a pill bug (Yukihisa Tokuda)

Follow a "scavenger of nature" and discover just what makes these little bugs so fascinating. Discover how they spend their days, what they eat, where and when they sleep, and how they protect themselves. There are also tips on having a pill bug come to stay at your house...but only for a while!

Barnacles (Lola M. Schaefer)

A basic introduction to barnacles, discussing their physical characteristics, habitat, diet, and activities.

The life cycle of a crab (Jill Bailey)

Describes the physical characteristics, habitat, food, and reproductive cycle of the crab.

The World of Crabs (Jennifer Coldrey)

Simple text and photographs depict crabs feeding, breeding, and defending themselves in their natural habitats.

Crab (Rebecca Steffoff)

Examines the physical characteristics, life cycle, and natural habitat of different types of crabs.

Dancing on the sand : a story of an Atlantic blue crab (Kathleen M. Hollenbeck)

Blue Crab scuttles through the shallow waters of the Chesapeake Bay to find a mate, to molt, and to avoid predators while waiting for her eggs to hatch.

Crawling Crabs (Natalie Lunis)

Text and photographs present amazing facts about crabs.

Crabby & Nabby: A Tale of Two Blue Crabs (Suzanne Tate)

OWN

Two blue crabs feed together, mate, and see their offspring grow up to continue the life cycle.

Old shell, new shell : a coral reef tale (Helen Ward)

A hermit crab who has outgrown his shell searches for a new one among the creatures of Australia's Great Barrier Reef.

Is this a house for Hermit Crab? (Megan McDonald)

When Hermit Crab outgrows his old house, he ventures out to find a new one.

Crayfish (Phyllis Grimm) [Early Bird Nature Book]

Describes the physical characteristics, behaviors such as the search for food and eating habits, method of reproduction, habitat, and survival challenges of this group of crustaceans.

Lobster's secret (Kathleen M. Hollenbeck)

Lobster emerges from his rocky hiding place off the Maine coast and prowls for dinner while watching for predators, a task made even more difficult after he molts.

Lobsters (Jason Cooper) [Animals Without Bones]

A simple introduction to the physical characteristics, life cycle, and habitat of members of the lobster family.

ARTHROPODS -- CENTIPEDES AND MILLIPEDES

Centipedes (Jason Cooper) [Animals Without Bones]

A simple introduction to the physical characteristics, life cycle, and habitat of centipedes and other myriapods.

Millipedes (Donna Schaffer) [Life Cycles]

Describes the physical characteristics, life cycle, behavior, and adaptations of the millipede.

ARTHROPODS -- SCORPIONS AND HORSESHOE CRABS

Scorpions (Peter Murray)

Describes the physical characteristics, behavior, and life cycle of scorpions.

Horseshoe crabs (Lola M. Schaefer)

A basic introduction to horseshoe crabs, discussing their physical characteristics, habitat, activities, and diet. What are horseshoe crabs? -- Where do horseshoe crabs live? -- What do horseshoe crabs look like? -- Do horseshoe crabs really have shells? -- What do horseshoe crabs feel like? -- How big are horseshoe crabs? -- How do horseshoe crabs move? -- What do horseshoe crabs eat? -- Where do new horseshoe crabs come from?

ARTHROPODS -- SPIDERS

Vocabulary:

arachnid
spinnerets
fangs
venom
dragline
prey
egg sac
ballooning
molt
spiderling
arachnologist

Basics:

Insects belong to the invertebrate branch of the animal kingdom—"invertebrate" means animals without backbones.

Insects have no endoskeleton (internal skeleton) but they have an exoskeleton (external structural covering).

They are arthropods (which means 'jointed foot') -- cold-blooded animals with jointed legs.

A spider's body is comprised of the cephalothorax (fused head and thorax) and abdomen.

Its spinneret, located at the tip of the abdomen, releases the silk.

Be able to:

List four characteristics of spiders using numbers to describe and count body parts

Classify pictures of animals as spiders or non-spiders

List two parts of the spider's food chain

Describe at least three characteristics of a spider's habitat

List at least four types of spider webs

Name one benefit of spiders to humans

Name at least two natural enemies of spiders, including man

List two animals that are prey of spiders

Describe a spider's life cycle

Describe how a spider's web feels, looks and works

Spiders -- Kinds of spiders -- Spider's bodies -- Spider eyes -- Fangs -- Looking for spiders -- Spider eggs -- Spiderlings -- Food for spiders -- Spiders in danger!

The Spider's Dance (Joanne Ryder)

When tiny spiders burst out of their eggs, the dance of the spider's life cycle begins.

Once I Knew a Spider (Jennifer Dewey)

An expectant mother watches as an orb weaver spider spins a web, lays her eggs, and stays with them over the winter.

Be Nice to Spiders (Margaret Bloy Graham)

OWN

When Billy left his pet spider, Helen, at the Zoo, the animals suddenly became happy and contented. The lions snoozed all day long, the elephants enjoyed their baths, and the zebras ate their hay in peace -- all because Helen was spinning webs and catching flies. But one day Helen's webs were swept away. The Keeper had the cages cleaned for the Mayor's inspection tour. Soon the flies were back again and the animals were miserable once more. But not for long...

The Little Buggers: Insect & Spider Poems (Patrick J. Lewis)

An assortment of poems featuring insects and spiders.

Amazing World of Spiders (Janet Craig)

OWN

The Spider Makes a Web (Joan M. Lexau)

OWN

Traces the life cycle of a shamrock spider who spins her web under a blackberry bush.

Spiders spin webs (Yvonne Winer)

Rhyming text describes how, when, where, and why spiders spin webs. Includes a spider identification guide.

Spider's web (Christine Back)

Text and photographs describe how a garden spider spins her web and how she uses it to catch food.

Are You a Spider? (Judy Allen)

OWN

The narration addresses a newly hatched spider, instructing it in the art of spinning thread and creating a proper web, and warning it to watch out for birds and wasps.

Spider Names (Susan Canizares)

(Science Emergent Readers)

OWN

Uses photographs and simple text to explain how different species of spiders got their names.

How and Why Spiders Spin Silk (Elaine Pascoe) (*How and Why Series*)

OWN

ARTHROPODS -- INSECTS

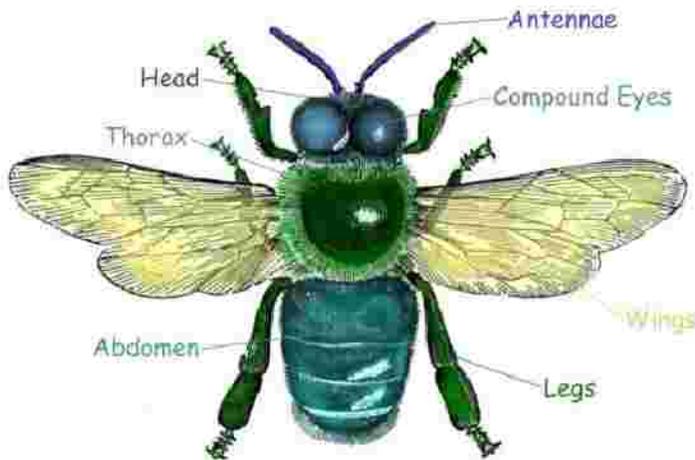
Vocabulary:

antennae
exoskeleton
mandible
pollination
nectar
camouflage
larva (larvae)
pupa (pupae)
nymph
molt
metamorphosis
caterpillar
chrysalis
nectar
proboscis
thorax
abdomen
spiracles
entomologist
compound eyes

Basics:

Insects belong to the invertebrate branch of the animal kingdom—"invertebrate" means animals without backbones.

They are arthropods (which means 'jointed foot') -- cold-blooded animals with jointed legs.



Insects have three main body parts: the head, thorax, and abdomen.

Head: An insect has a small head that is a lot like your own head because it holds the insect's brain, eyes, and mouth. Insects also have special feelers called antennae that stick out of the top of their heads. They use their antennae to smell and feel because they do not have noses and hands like we do.

Thorax: Right below the insect's head is a middle section called the thorax. The thorax of an insect is kind of like your chest, except insects have six legs that come out of their thorax! Insect legs have special joints (sort of like your knees) and tiny barbs on the ends instead of toes. Many kinds of insects have one or two pairs of wings attached to their thorax.

Abdomen: The part below an insect's thorax is called the abdomen. It is the largest part of the insect's body and contains its stomach, just like your abdomen does. It also contains the insect's reproductive system. Insects can reproduce (have babies) very quickly. Most insects reproduce by laying eggs, like chickens do, only insect eggs are very tiny and have soft shells.

Insects have no endoskeleton (internal skeleton) but they have an exoskeleton (external structural covering) which protects its internal organs. They have no bones either.

Most have six legs (some have none, such as silverfish).

Most insects have compound eyes:

They have two compound eyes with many different lenses to see out of instead of just one lens in each eye like we do. Each compound eye can have anywhere from 2 to 30,000 different surfaces that are very sensitive to light. Compound eyes cannot see very much detail or things that are far away. They can see extremely quick movements and things that are close to them, though. If insects did not have compound eyes, they would have a very difficult time surviving and finding food! Have you ever tried to swat a fly? What happened when you got close to it? It probably flew away the second you got close enough to swat it. That is because a fly's compound eyes bulge out of its head so it can see motion all around its body and see when you are coming closer to it. Some insects, like grasshoppers, have compound eyes and normal eyes (called simple eyes)! With simple eyes, they can see a lot more detail and see things that are far away.

Go here to see compound eye:

<http://www.bioschool.co.uk/bioschool.co.uk/images/pages/insect%20compound%20eye.JPG.htm>

Only adult insects have wings; insects are the only invertebrates to be able to fly.

Understand various mouthparts. (Sucking: moth, chewing: beetle, piercing-sucking: flea, sponging-lapping: fly).

They breathe through spiracles – tiny holes in the exoskeleton.

Understand difference between complete and incomplete metamorphosis:

Complete
4 stages (egg, larva, pupa, adult)

butterflies and moths
flies
fleas
ants
bees and wasps
beetles

Incomplete
3 stages (egg, nymph, adult)

silverfish
dragonflies
termites
crickets and grasshoppers
mantids
cockroaches

* Most nymphs look like miniature copies of their parents without wings. They eat and molt as they grow.

Projects/Field Trips:

Identify various insects in our backyard with a field guide.

Create successful ant farm with kit I bought: “Ant Works”).

Experiment to see which foods attract ants.

Raise butterflies from eggs and caterpillars (done).

Trace migration path of Monarch butterfly on map.

Use a Venn diagram to compare moths and butterflies.

Raise mealworms (darkling beetle larvae).

See bee hive at Virginia Living Museum and at Bedford’s house.

Study our honeycomb, noting its shape. Find out what causes color differences in honey.

Backyard Pets: Activities for Exploring Wildlife Close to Home: Complete pages 42-53 including investigations (crickets).

General

DK First Animal Encyclopedia: (Penelope Arlon) [OWN]

Read pages 104-127.

The Usborne Complete First Book of Nature (Usborne) [OWN]

Read pages 73-96.

The Usborne Complete First Book of Nature (Usborne) [OWN]

Read pages 146, 148-157, 162-165.

Children of Summer: Henri Fabre’s Insects

Ten-year-old Paul describes how he and his sisters learned about insects from the observations and writings of their father, the nineteenth-century French entomologist Jean-Henri Fabre.

All About Bugs (Schlessinger Media) [videorecording]

Learn about many different kinds of bugs, including their common characteristics and the special roles they play in the circle of life. While seen as "pests", many bugs help to pollinate plants while others help to decompose plant and animal waste. Hands-on activity includes children making their

own vacuum trap that allows them to easily collect bugs for up-close study. An entomologist (bug expert) discusses important body features of bugs and how they adapt to survive in their environments.

Bugs (LeVar Burton) [videorecording] (*Reading Rainbow*)

Bugs includes general information, jokes and descriptions of the physical characteristics, habits, and natural environment of a variety of common insects. Other segments include: LeVar visits Insect world: with the assistance of an entomologist LeVar discovers the uniqueness of a wide variety of bugs and insects at Cincinnati Zoo's Insect World ; See the migration of Monarch Butterflies: take a trip to the mountains in Mexico to find out where monarch butterflies go when they migrate for the winter.

Magic School Bus: Bugs, Bugs, Bugs [videorecording]

Magic School Bus gets ants in its pants -- Magic school bus in a beehive -- Magic School bus, butterfly and the bog beast.

The Hidden World of Africa (David Highes) [videorecording]

Barely visible to the human eye, a truly fascinating universe lives in the bush and savannas of Africa. Here, creatures small, smaller and nearly invisible share a world with gigantic animals. Give this fascinating and tiny world a closer look and you'll discover the big wonders of small creatures.

About Insects: A Guide for Children (Cathryn P. Sill)

Describes the anatomy, behavior, and habitat of various insects, including the beetle, moth, and cockroach.

The True Book of Insects (Illa Podendorf)

OWN

God's Plan for Insects (Judy Hull Moore)

OWN

Describes various insects and the work God gave them to do.

Where Do Insects Live? (Susan Canizares)

OWN

Photographs and simple text describe the habitats of different insects.

Bugs for Lunch (Margery Facklam)

OWN

Rhyming text introduces bug-eating animals

Bugs! Bugs! Bugs! (Bob Barner)

OWN

In language simple enough to appeal to toddlers, the whimsical rhyming text describes buzzing bees, fuzzy caterpillars, hopping grasshoppers, fluttering butterflies, and curly roly-poly bugs. The cut-paper collage illustrations vibrate with color, showing a busy world full of big-eyed, smiling insects that seem ready to crawl off the page. The book ends with actual-sized illustrations of the creatures and a "Bug-O-Meter" that lists a few of their characteristics, such as where they live and how many legs they have.

Bugs! Bugs! Bugs! (Jennifer Dussling) *(DK Eyewitness Reader Level 2)* **OWN**

Read all about big bad bugs, clever little bugs, and some of the fiercest bugs ever.

Bugs (Nancy Winslow Parker) **OWN**

Includes general information, jokes, and brief descriptions of the physical characteristics, habits, and natural environment of a variety of common insects.

Icky Bug Alphabet Book (Jerry Pallotta) **OWN**

Introduces the characteristics and activities of insects and other crawly creatures from A to Z, beginning with the ant and concluding with the zebra butterfly.

Monster Bugs (Lucille Recht Penner) **OWN**

Describes some of the world's largest insects and spiders, including the Goliath beetle, praying mantis, tarantula, and giant atlas moth.

Have You Seen Bugs? (Joanne Oppenheim) **OWN**

Describes in verse a variety of bugs and how they look, behave, and improve our lives.

How to Hide a Butterfly and Other Insects (Ruth Heller) **OWN**

Rhyming text describes how various insects camouflage themselves to protect against predators.

102 Creepy Crawly Bug Jokes (Ski Michaels) **OWN**

Includes "What do you call a newborn ant? A baby buggy." and "Which bug costs only a penny? The cent-i-pede."

Itsy-Bitsy Beasties: Poems from around the World (Michael Rosen)

An anthology of short poems about insects and other small animals by authors from around the world.

INSECT ORDERS:

Lepidoptera: **butterflies, moths**

A First Look at Caterpillars (Millicent Ellis Selsam)

Briefly describes the life cycle and habitat of the caterpillar.

Butterflies in the Garden (Carol Lerner)

Over three dozen butterflies grace the pages of this book as Lerner shows families how to lure the winged beauties into their gardens. Her lush illustrations feature flowers and plants that attract

hungry butterflies, and the clear text explains how butterflies grow from caterpillars to full-grown fliers.

Where Butterflies Grow (Joanne Ryder)

Describes what it feels like to change from a caterpillar into a butterfly. Includes gardening tips to attract butterflies.

The Monarch's progress : poems with wings (Avis Harley)

"Why are butterflies so universally loved? Is it the dazzling colors within exquisite winged living art? Is it the miracle of change that fascinates us--that wonderful metamorphosis from tiny egg to brilliant insect? Avis Harley explores these questions and many others that have captivated humans throughout history. Eighteen structured poems--haiku, sonnets, cinquain, limerick, and other forms--examine how monarch butterflies taste with their feet, migrate 2,500 miles every year, and cover entire forest groves when they rest. A 'Small Matters' section at the back explains the facts and science in the poems."

Butterflies and Moths [from The Usborne Complete First Book of Nature] OWN

Comprehensive overview.

Butterflies and Moths (George Fichter) (A Golden Junior Book) OWN

Comprehensive overview.

Butterflies (A Scholastic First Discovery Book) OWN

Fun transparent sheets make this a must-read.

Butterflies Fly (Yvonne Winer) OWN

Aspiring lepidopterists can learn how, when, where and why butterflies take flight in flowery prose. A simple, poetic book. **Nathan read aloud.**

Waiting for Wings (Lois Ehlert) OWN

With rhyming text and colorful collages, questions about the life cycle of the butterfly are answered. A very simple but pretty book. **Ben read aloud.**

I'm a Caterpillar (Jean Marzollo) (Hello Reader Level 1) OWN

Moffatt's textured-paper collage illustrations and Marzollo's easy text bring this beginning reader to life. The story presents just enough facts about the life cycle of a caterpillar to interest young students. The extra-large print and short sentences will enable first graders to read it alone. **Ben read this aloud.**

Butterflies (Karen Shapiro) (Hello Reader Level 2) OWN

With catchy rhyming text, author Karen Shapiro gives readers a very simple lesson in the process of metamorphosis from caterpillar to butterfly. **Nathan read aloud.**

A Luna Moth's Life (John Himmelman)

Illustrations and simple text describe the life cycle of a luna moth.

Sphinx: The Story of a Caterpillar (Robert M. McClung)

Details a year in the life of a sphinx moth, which is known as the horned tomato worm in its caterpillar stage.

Isoptera: termites

Through a Termite City (Carole Telford)

Describes the inhabitants, social structure, and activities of an African termite mound.

Hemiptera:

true bugs (stink bugs, water striders, squash bugs)

True Bugs: When is a Bug Really a Bug? (Sara Swan Miller)

An introduction to true bugs, a taxonomic order of insects, that includes descriptions of fourteen species and recommendations for finding, identifying, and observing them.

cicadas, treehoppers, aphids, scale insects, white-flies

When the Woods Hum (Joanne Ryder)

Jenny experiences the wonder of seeing and hearing the woods fill up with humming cicadas, and seventeen years later she returns with her young son to share that experience.

Diptera: flies, fruit flies, gnats, mosquitoes

Biting Flies (Patrick Merrick)

Describes the physical characteristics, behavior, and life cycle of different kinds of flies that bite.

Mosquitoes (Mary Ann McDonald)

Examines the physical characteristics, behavior, habitat, and life cycle of mosquitoes.

Gnat (Kitty Benedict)

Discusses the physical characteristics, life cycle, and usefulness of gnats.

Siphonaptera: fleas

Fleas (Kathryn Stevens)

Describes the physical characteristics, behavior, habitat, and life cycle of fleas.

Phasmatodea: stick and leaf insects

Walking Sticks (Tamara Green)

Examines the anatomy, behavior, life cycle, and different kinds of walking sticks.

Odonata: dragonflies

Are You a Dragonfly? (Judy Allen)

OWN

The most colorful wings on the pond belong to the nimble dragonfly, but this delicate flying insect didn't begin life in the air. The secrets of metamorphosis are unfurled in this story of the life of a familiar backyard creature.

Orthoptera: grasshoppers, crickets, katydids

Grasshopper (Karen Hartley)

A simple introduction to the physical characteristics, diet, life cycle, predators, habitat, and lifespan of grasshoppers.

Chirping Crickets (Melvin Berger) [not central] (*Let's-Read-and-Find-Out Science. Stage 2*)

Describes the physical characteristics, behavior, and life cycle of crickets while giving particular emphasis to how they chirp.

Blattodea: cockroaches

Cockroach (Karen Hartley)

[not central]

A simple introduction to the physical characteristics, diet, life cycle, predators, habitat, and lifespan of cockroaches.

Cockroaches (Patrick Merrick)

Describes the physical characteristics, behavior, habitat, and life cycle of cockroaches.

Mantodea: mantids (ex. praying mantis)

Praying Mantis (Olive Lydia Earle)

[not central]

Describes the habits and characteristics of the praying mantis and follows the activities of a Chinese mantis in the author's garden.

Praying Mantis, The Garden Dinosaur (Gladys Plemon Conklin)

[not central]

Introduces the Tenodera mantis which came to the United States from China. Includes directions for keeping a female praying mantis as a pet.

Praying Mantis (Renecca Steffoff)

Introduces the life cycle and habitat of the praying mantis as well as the related stick and leaf insects.

Coleoptera: beetles, ladybugs

Beetles [video recording] (Schlessinger Media)

Describes the metamorphosis of beetles, demonstrates how to make a beetle habitat, and discusses aspects of bug life including body structure, life cycle, and social behavior.

Living Lights: Fireflies in Your Backyard (Nancy Loewen) (*Backyard Bugs*)

Describes the physical characteristics, life cycle, and behavior of fireflies.

A Mealworm's Life (John Himmelman)

The book combines a simple text with beautiful images. Also included is a short glossary of terms. Set on a farm, the book tells the story of a mealworm's life from her being laid as an egg to the hatching of her own offspring. The text covers its main character's metamorphoses, encounters with other creatures, etc.

Mealworms: Raise Them, Watch Them, See Them Change (Adrienne Mason)

Find a jar, half-fill it with some bran, add a potato or apple wedge and you're all set to raise some mealworms. At school or at home, watch the miracle of insect metamorphosis with safe and easy mealworms

Ladybug (Emily Bernhard)

Text and pictures introduce the familiar ladybug, consumer of aphids and scale insects and purported carrier of good luck.

A Ladybug's Life (John Himmelman)

Illustrations and simple text follow the daily activities of a ladybug through its life cycle, from summer to fall.

The Ladybug (Sabrina Crewe)

Describes the life cycle, habitat, and eating habits of the seven-spotted ladybug and similar beetles.

The Beetle Alphabet Book (Jerry Pallotta)

OWN

Uses letters of the alphabet to introduce various kinds of beetles.

Hymenoptera: bees, wasps, ants

Bees, Wasps, and Ants (George S. Fichter)

(A Golden Junior Guide)

OWN

Comprehensive guide.

Bees and Wasps

The Honey Makers (Gail Gibbons)

Covers the physical structure of honeybees and how they live in colonies, as well as how they produce honey and are managed by beekeepers.

The life cycle of a bee (Lisa Trumbauer)

Simple text and photographs present the life cycle of the bee.

The Life and Times of the Honeybee (Charles Micucci)

Depicts the life cycle and habits of the honeybee, describing in detail the organization of the hive and the making of honey.

Hornets' Nest (Kate Scarborough)

Follows the step-by-step process of a hornets' nest being built. Features step-cut pages to emphasize the way things get bigger as they grow.

Jason and the Bees (Brom Hoban)

Jason meets a beekeeper and learns about bees and their habits.

Honeybees (Joyce Milton) *(All Aboard Science Reader)* OWN

Learn all about the life cycle of honeybees, how they make honey, and more.

Honey in a Hive (Anne F. Rockwell) *(Let's Read-and-Find-Out Science 2)* OWN

An introduction to the behavior and life cycle of honeybees, with particular emphasis on the production of honey.

Ants

Ants (Barrie Watts) *(Keeping Minibeasts)*

A guide to keeping ants temporarily for the purpose of observing them.

Ant (Kitty Benedict)

Discusses the wood ant's life cycle, nest, feeding habits, enemies, and benefits to humanity.

Tiny Workers: Ants in Your Backyard (Nancy Loewen) *(Backyard Bugs)*

A-mazing little homes -- What do ants eat? -- Queen ants -- Starting a colony -- New workers -- Ants and people -- Look closely at an ant -- Fun facts -- Make an ant farm.

The Life and Times of the Ant (Charles Micucci)

Describes the evolution, physical characteristics, behavior, and social nature of ants.

Army Ant Parade (April Pulley Sayre)

As a swarm of army ants move over the ground in a thick stream, searching for food, antbirds follow them to eat the insects that flee from the swarm. After the hungry ants have found one meal, they move on, and soon the forest is quiet again.

Inside an Ant Colony (Allan Fowler)

(Rookie Read-About Science)

Describes how these social insects live and work together in organized communities that are like bustling cities.

Thinking About Ants (Barbara Brenner)

Asks the reader to imagine what it would be like to be an ant, describing what ants look like, what they eat, where and how they live, and more.

Armies of Ants (Walter Retan)

(Hello Reader! Level 4)

OWN

This fascinating look at a number of ant varieties and their lives touches on food gathering and production, rearing of young, and interaction with other ant species.

Those Amazing Ants (Patricia Demuth)

OWN

Describes those fascinating insects, the ants, in simple words and pictures.

Ant Cities (Arthur Dorros)

(Let's-Read-and-Find-Out Science Book)

OWN

Explains how ants live and work together to build and maintain their cities.

Little Black Ant (Alice Gall)

OWN

Living book – story form