

INSECTS

Grade Level: Second Grade

Presented by: Susan Butman, Littleton Academy, Littleton, CO

Length of Unit: 15 lessons (includes assessments, field trips, guest speaker)

I. ABSTRACT

This insect unit will provide students with an introduction to insects as well as insight into insect development. We will also study individual insects such as ants, honeybees, and butterflies. This is a multi-disciplinary unit that provides hands-on experiences for the students.

II. OVERVIEW

A. This presentation will cover suggestions for planning, design, and implementation of a Core Knowledge unit. Direct, hands-on experience and specific science process skills will be included for a more effective instruction.

B. Specific Content and Skills

1. Unit Planning

a. Content from Core Knowledge Sequence

(1) Science, Grade 2 II. Insects

b. Specific Skills to be taught

(1) Study Skills to be taught

(a) Highlighting and note-taking.

(b) Reading and understanding a time-line.

(c) Sequencing as found in life cycle presentations.

(d) Information gathering, organization of information and presentation of information within specific project and presentation requirements.

(2) Science Process skills

(a) observation

(b) predicting

(c) hypothesis

(d) measurement

(e) experiment procedures

(3) Language Arts instruction

(a) interpretation of poetry and prose

III. BACKGROUND KNOWLEDGE

A. For Teachers

1. Beech, Linda Ward. *Integrated Theme Units: Insects*. Scholastic. 1992. ISBN 0-590-49310-8

2. Core Knowledge Foundation. *Core Knowledge Sequence* Charlottesville, VA. 1997. 804-977-7550

3. Mound, Laurence. *Amazing Insects*. Eyewitness Junior Series. New York. Alfred A. Knopf, Inc., 1993. ISBN 0-679-83925-9

B. For Students

1. *Core Knowledge Sequence*, Kindergarten. Animals and Their Needs

2. *Core Knowledge Sequence*, First Grade. Habitats, Environmental Change and Habitat Destruction, Special Classifications of Animals

3. *Core Knowledge Sequence*, Second Grade. Life Cycles

IV. RESOURCES

A. Key Resources for Teachers

1. Aardema, Verna. *Why Mosquitoes Buzz in People's Ears*
2. Allinson, Beverly. *Effie*
3. *Amazing Beetles* (Eyewitness Junior Book)
4. Any Resources on Insects, any Theme Unit Books on Insects
5. Aylesworth, Jim. *Old Black Fly*
6. Beech, Linda Ward. *Integrated Theme Units: Insects*. Scholastic. 1992 ISBN 0-590-49310-8
7. Bernard, Robin. *The Life of a Butterfly*. Scholastic, 1995.
8. Brown, Ruth. *Ladybug, Ladybug*
9. *Butterflies and Moths* (Usborne First Nature Book)
10. Cameron, Polly. *"I Can't" Said the Ant*
11. Carle, Eric. *The Grouchy Ladybug*
12. Carle, Eric. *The Very Hungry Caterpillar*
13. Carle, Eric. *The Very Quiet Cricket*
14. Cole, Joanna. *The Magic School Bus Inside a Beehive*. Teacher Created Materials, Inc.
15. Cole, Joanna. *The Magic School Bus Gets Ants in Its Pants*. Scholastic, 1996.
16. Computer Program: *Multimedia-Bugs*. Inroads Interactive, 1996. 303-444-0632
17. Core Knowledge Foundation. *Core Knowledge Sequence*. Charlottesville, VA. 1997. 804-977-7550
18. Cox, Rosamund Kidman. *Butterflies And Moths*. Usborne, 1980.
19. Creepy Crawlies. *Macmillan Imagination Station*. Newbridge Communications, 1995
20. Dallinger, Jane. *Grasshoppers*
21. Davis, Bette J. *Musical Insects*
22. *Discover Butterflies* (Eyewitness Junior Book)
23. Dorros, Arthur. *Ant Cities*
24. Farber, Norma. *Never Say Ugh to a Bug*
25. Fisher, Aileen. *Cricket in a Thicket*
26. Fisher-Nagel, Andreas and Nagel, Heiderose. *The Life of a Ladybug*
27. Fleishman, Paul. *Joyful Noise: Poems for Two Voices*
28. Foster, Walter. *"I can Draw" BUGS*. Joshua Morris Publishing, 1994.
29. Gibbons, Gail. *Monarch Butterfly*
30. Glenn, Jr., George S. *Start Exploring INSECTS*. Running Press, 1991.
31. Gosnell, Kathee. *Thematic Unit: INSECTS*. Teacher Created Materials, Inc., 1995. ISBN 1-55734-592-9
32. Heller, Ruth. *How to Hide a Butterfly*
33. Hepworth, Cathi. *ANTics*
34. Hoberman, Mary Ann. *Bugs*
35. Howe, James. *I Wish I Were A Butterfly*. Voyager Books, 1987.
36. *Insect* (Eyewitness Book)
37. Jeunesse, Gallimard. *The Ladybug and Other Insects*
38. Johnson, Sylvia A. *Chirping Insects*
39. Kids Discover. *Insects*, June Issue. Kids Discover, 1998
40. Lepthien, Emillie U. *Monarch Butterflies*
41. Lyon, George Ella. *The Outside Inn*
42. Mailbox Magazines (April/May 1996)
43. Moore, Jo Ellen. *Animal Life Cycles*. Evan-Moor, 1994 ISBN 1-55799-093-X
44. Moore, Jo Ellen. *Life Cycles Science Sequencing*. Evan-Moor, 1986.
45. Overbeck, Cynthia. *The World of Ants*
46. Owen, Jennifer. *Mysteries and Marvels of Insect Life*. Usborne, 1984.

47. Pallotta, Jerry. *The Icky Bug Alphabet Book*
 48. Parker Nancy Winslow and Wright, Richard. *Bugs*
 49. Peterson, Roger Tory. *A Field Guide to Butterflies Coloring Book*. Houghton Mifflin Company, 1983.
 50. Pinkham, Julia. *The Insect Alphabet Coloring Book*. Stemmer House Publishers, 1995.
 51. Podendorf, Illa. *Insects*
 52. Retan, Walter. *Armies of Ants*. Scholastic, 1994.
 53. Ryder, Joanne. *When the Woods Hum*
 54. Ryder, Joanne. *Where Butterflies Grow*
 55. Sanved, Kjell B. *The Butterfly Alphabet*. Scholastic, 1998.
 56. Selsam, Millicent E. *Backyard Insects*
 57. Selsam, Millicent E. *Bees, Bugs, and Buzzers*
 58. Van Allsburg, Chris. *Two Bad Ants*
 59. Watts, Barrie. *Honeybee*
 60. Watts, Barrie. *Ladybugs*
 61. Watts, Barrie. *Moth*
 62. Wexo, John Bonnett. *Zoobooks - Insects I and II*. Wildlife Education, 1994.
 63. Yoshi. *The Butterfly Hunt*
 64. Young, Caroline. *The Big Bug Search*. Usborne, 1996.
- B. Other Resources - Alternative Mediums
1. Uncle Milton Ant Farm
 2. Children's Literature, Videos, CDs
 3. Hands-on projects
 4. School Days Magazine
 5. Live Insect Specimen and miscellaneous items
 6. Blue Spruce Supply Company
 - a. Insect Lore 1-800-826-4974
 - b. Insect Zoo: Smithsonian Institution, National Museum of Natural History, Tenth and Constitution Ave., NW, Washington, D.C. 20560
 - c. Academy of Natural Sciences, Philadelphia, PA 215-299-1020
 - d. World of Insects Exhibit, Cincinnati, OH 513-281-4701
 - e. Butterfly Exhibit Vallejo, CA 707-643-6722
 - f. Butterfly Works, Coconut Creek, FL 305-977-4400
 - g. Day Butterfly Center, Pine Mountain, GA 404-663-2281
 - h.

V. LESSONS

A. Lesson 1: Introduction to Insects

1. Objectives/Goals
 - a. Insects belong to a large group of animals call arthropods.
 - b. Students will be able to identify characteristics of Arthropods, specifically, insects.
 - c. Students will participate in classification, observation, vocabulary, and two-column note taking.
2. Materials: Pictures, poems, posters, resource books on Insects, chart paper, Multimedia – BUGS
3. Key Vocabulary:
Arthropod, exoskeleton, entomology
4. Activities
 - a. read "Riddle" by Mary Ann Hoberman. From BUGS by Mary Ann Hoberman. Copyright 1976. Or use any available poem or story about insects.

- b. Show pictures of insects; ask students to review what they already know about insects.
 - c. Using Two-column note taking, discuss Arthropods; major characteristics: jointed legs, exoskeleton. List the five major groups, (arachnids, crustaceans, centipedes, millipedes, and insects). Entomology.
 - d. List Facts on Insects.
 - e. Using chart paper, begin an ABC list of Insect Vocabulary. (A=arthropod, B=bee, C=caterpillar, etc.)
 - f. Using CD-ROM, Multimedia Bugs, explore software.
5. Evaluation/Assessment
Show pictures of arthropods and ask students to identify which group of arthropods it represents.
Review the characteristics of Insects.

B. Lesson 2: Time Line Charting of Insects

- 1. Objectives/Goals
 - A. Insects have been on earth longer than the dinosaurs. There are over five million different kinds of insects in the world.
 - B. Review of arthropod characteristics and facts about Insects. Students should be able to locate insects on a time line.
 - C. Classification, observation, highlighting for information, using a time line. Organizing information.
- 2. Materials: Materials for student portfolios for use with this insect unit. Overhead projector, transparencies of first few booklet pages, including time line, highlighters for students.
- 3. Key Vocabulary: Time line. Review arthropod, exoskeleton, jointed legs, and entomology.
- 4. Activities:
 - a. Review insect facts and notes from Lesson
 - b. Make student portfolio booklets (or have them printed ahead of time and simply distribute and allow students to decorate with stickers, drawings, pictures from magazines, etc.).
 - c. Copy and read together *Introduction*, from *The Insect Alphabet Coloring Book* by Julia Pinkham, ISBN 0-88045-134-3. Students highlight important terms and information.
 - d. Make a time line for insects.
fish 440 m (m = million), cockroaches 360 m., dragonflies 300 m., dinosaurs 225 m., mammals 180 m., birds 150 m., dinosaurs die out 65 m., butterflies 60 m., early whales 50 m., fleas 40 m., early humans 1.5 m.

C. Lesson 3: Insect Parts

- 1. Objectives/Goals
 - a. Students will be able to distinguish characteristics of insects.
 - b. Students will identify the main parts of an insect.
 - c. Students will use observation, vocabulary, highlighting for information, construction of a paper model.
- 2. Materials: Student booklets, any diagram of an insect where parts can be labeled pattern for a 3D cricket; Carle, Eric. *The Very Quiet Cricket*
- 3. Key Vocabulary:
Exoskeleton, the three main body parts: head, thorax and abdomen antennae
- 4. Activities
 - a. Review. Use Evan-Moor, *Animal Life Cycles*, Insects, page 5, ISBN 1-55499-093-X
 - b. poster, overhead or diagram of an insect. Label parts.
 - c. Have students put together 3-D cricket from Evan-Moor, *Seasonal Art*. Label parts.
 - d. Read *The Very Quiet Cricket*, by Eric Carle.

D. Lesson 4: Insect Development

1. Objectives/Goals
 - a. Students learn that insects develop from an egg to an adult in three ways.
 - b. The students will learn that after insect hatches from an egg, it follows one of three patterns of growth and development, depending on its species.
 - c. Students learn the sequence of insect development.
2. Materials: Pictures of insects in stages of metamorphosis; The Butterfly Life Cycle Flip Book. - Project. Student booklet, optional.
3. Key Vocabulary
Metamorphosis, molting, egg, larva, pupa, simple change, incomplete change, complete change
4. Activities
 - a. Show pictures, posters, and diagrams of the different stages of metamorphosis. Use an overhead and demonstrate two-column note taking as you discuss the three different ways insects may develop.
 - b. Put together a Butterfly Life Cycle Flip Book.
 - c. Read *The Life of a Butterfly*, Scholastic, 1995, ISBN 0-590-65999-5, or any Butterfly book, fiction or non-fiction.

E. Lesson 5: Social Insects

1. Objectives/Goals
 - a. Students learn about social and colonies.
 - b. Students will understand that while most insects live solitary lives, some are social (such as ants, honeybees, termites, and wasps).
 - c. Students use observation and prediction.
2. Materials: Uncle Milton Ant Farm, live ants; *Armies of Ants* by Walter Retan
3. Key Vocabulary: Social insects, queen, and worker ants colony
4. Activities
 - a. Set up Uncle Milton's Ant Farm or create one of your own (one-quart mason jar, ant hill with live ants, 1-inch square piece of sponge, eyedropper, water, ant food such as wheat germ, cookie crumbs, or sugar cube. Tape light and dark pieces of construction paper to opposite sides of the jar. Place twigs and leaves into jar, cover with nylon stocking or gauze and a rubber band). Observe the ants, use magnifying glasses.
 - b. Discuss the ant colony community.
 - c. Read sections of *Armies of Ants* by Walter Retan.

F. Lesson 6: Ants

1. Objectives/Goals
 - a. Students will learn that ants live in organized communities and are known as social insects.
 - b. Students will use observation, note taking, and writing using detail.
2. Materials
Any books, pictures, videos, or computer software that shows ants as they live and work in the ant colony; paper and pencil.
3. Key Vocabulary: colony, castes (classes). These castes are queen, workers, and males, egg, larva, pupa, adult.
4. Activities
 - a. Show pictures, share books about life in an ant colony.
 - b. Observe, predict, and describe the activities in the ant farm.

- c. Record observations and comments in student booklets or science journals. Imagine the inside of an ant's nest. Students pretend they are an ant. Have students write a story about their ant colony life. Share them.

G. Lesson 7: Language Arts Instruction for Interpretation of Literature.

1. Objectives/Goals
 - a. Interpretation of literature, imagination of an ant's eye view of the world.
 - b. Enjoyment of literature, use of imagination, creative writing
2. Materials: *Two Bad Ants*, by Chris Van Allsburg, paper, pencil.
3. Key Vocabulary: Ant's eye view
4. Activities
 - a. Read *Two Bad Ants*, by Chris Van Allsburg.
 - b. Guess items in the book described from an ant's eye view.
 - c. Write short stories from an ant's point of view.
 - d. Describe some other household things to your fellow ants. See if they can guess what they are.
 - e. Read *The Ant and the Grasshopper*, an Aesop fable. Two insects, with human characteristics, teach a basic lesson; a lazy grasshopper learns the value of working hard and planning ahead. Have students describe the character of the Ant, grasshopper.

H. Lesson 8: Honeybees

1. Objectives/Goals
 - a. Students learn that honeybee colonies include three classes honeybees: queen, workers, drones. Honeybees are important insects.
 - b. Students read for information, two column note-taking and follow project directions.
2. Materials: Books, pictures, videos and computer software about bees, specifically, honeybees.
3. Key Vocabulary: Queen, workers, drones, development cycle - egg, larva, pupa, adult
4. Activities
 - a. Read *Honeybee*, by Barrie Watts.
 - b. Discuss how a bee grows.
 - c. Make a bee calendar as suggested in *Integrated Theme Units*, 1992 Scholastic, page 21.
 - d. Invite a beekeeper to visit and discuss how bees make honey, wax.
 - e. Honey treats. Find simple honey recipes to share.
 - *Cut apples into slices. Dip each slice into honey.
 - *Make popcorn. Heat honey. Pour over popcorn. Toss. With buttered hands, quickly form the coated popcorn into balls.
 - f. Make a honeybee for decoration. See Evan-Moor, *Seasonal Art*.

I. Lesson 9: Butterfly

1. Objective/Goals
 - a. The butterfly is one of the most beautiful of all insects. The beauty and grace of these insects have inspired artists and poets.
 - b. Students become familiar with butterflies, particularly their life cycle.
 - c. Students learn about observation, inference, measurement, and classification
2. Materials:

Pictures or other visual media about butterflies.
 Butterfly Garden from Insect Lore, 1-800-826-4974, they also supply painted lady butterfly larvae, ant farms, silkworm eggs, live ladybird beetles.
Decorative Kites by Alan & Gill Bridgewater.
3. Key Vocabulary: caterpillar (larva), chrysalis (pupa), butterfly (adult) migration - Monarch
4. Activities:

- a. Review body parts of a butterfly.
- b. Discuss and illustrate life cycle of a butterfly.
- c. Set up *Butterfly garden*, from Insect Lore, 1-800-826-4974. Plan ahead, approximately three weeks is needed.
- d. Measure live caterpillar specimen, feed. Make notes in science journal.
- e. Make daily or weekly observations of the growing butterfly stages.
- f. Make butterfly kites, mobiles, creative decorations.

J. Lesson 10: Moths vs. Butterflies; the Silkworm

1. Objectives/Goals
 - a. Moths and butterflies may look alike, but they are actually quite different. Silkworms make silk.
 - b. The students compare butterflies to moths and note differences, similarities.
 - c. Students learn observation, classification, comparing.
2. Materials: Usborne First Nature, *Butterflies and Moths*. Books, pictures, videos or computer software about butterflies, moths, the silkworm.
3. Key Vocabulary: eggs, caterpillar, chrysalis cocoon
4. Activities:
 - a. Read aloud *The Butterfly Collector* by Naomi Lewis.
 - b. Create a chart showing the differences between a butterfly and a moth.
 - c. Share information about the Silkworm. Make a story sequence booklet showing the steps for making silk. (Ancient China unit also teaches this.)
 - d. Use Evan-Moor, *Animal Life Cycles*, page 8, ISBN 1-55799-93-X.

K. Lesson 11: Insect Habits and Habitats

1. Objectives/Goals
 - a. Students recognize that there are daytime insects and nighttime insects. Students appreciate the effectiveness of insect camouflage.
 - b. Students learn categorization, field study, and graphing data.
2. Materials: *Integrated Theme Units*, 1992 Scholastic, and pages 28, 30, and 31. List of insects and their habits.
3. Key Vocabulary: bee, butterfly, cockroach, cricket, grasshopper mosquito, moth, square foot
4. Activities
 - a. Day or Night? *Integrated Theme Units*, 1992, Scholastic, page 28.
 - b. Select a variety of insects. Research their habits. Make a chart for Daytime insects and for Nighttime insects.
 - c. Make a list of insect homes and hideouts. Encourage students to find out which bugs prefer which hiding spot.
 - d. Design a bulletin board with light blue paper to represent the sky. Cover the middle third with green paper cut to represent grass, and the bottom third with brown paper to represent soil beneath the grass. Decorate with trees; hollow logs, flowers, puddles, leaves, etc. Attach the decorations so that each one becomes a pop-up door. Hide the appropriate insects underneath.
 - e. Discuss the meaning of a square foot (a square that is one foot long on every side). Students make a square foot frame to study insects and provide data for a graphing activity. Have students take the frame to an outdoor spot, such as a playground, field or sidewalk. Students place their frame on the ground and, for five minutes, count and tally every insect they find within the square foot area. Back in classroom, have students contribute data to a class bar graph or pictograph that shows the total number of insects observed. Have students make up questions based on the data in the graph.
 - f. Mix up a sticky substance of honey, fruit juice, and mushy fruit. Spread on logs, fences, stone walls, and corner of the playground. Return to the site in a few hours

to observe the insects that come to feed. Have students write their observations in science journals or recording sheet. Experiment to see if different insects appear during the night and in the day.

L. Lesson 12: Insects: Helpful and Harmful

1. Objectives/Goals

- a. Students will learn ways insects can be helpful and ways insects can be harmful.
- b. Students learn problem solving.

2. Materials: Books, pictures, videos or computer software about how insects are helpful and harmful.

3. Key Vocabulary: pests, pollen and pollination, predators, insect control

4. Activities:

- a. Discuss some of the ways in which insects can be helpful. Ask a beekeeper to include this topic when speaking to the class.
- b. Plan a garden and incorporate ways to attract helpful insects.
- c. List ways insects are harmful. Discuss ways to implement insect control.
- d. Display an assortment of insect repellent lotions and other anti-insect devices, such as insecticide sprays, fly swatters, flypaper, roach and ant traps, and electronic insect zappers in the classroom. Talk about the way each compound or device works, which it protects, and what warnings it carries for people, pets, or the environment.
- e. Invite students to share experiences they may have had with stings, allergies, or other problems caused by insects, and how the problems were addressed.
- f. Share this familiar rhyme about the ladybug, or ladybird beetle:
*Ladybug, ladybug, fly away home,
Your house is on fire; your children will burn.*
- g. This rhyme came from England long ago. English farmers who grew hops know that ladybugs helped them by eating the insects that attacked their crops. But after a harvest, when farmers would burn away the old vines, they worried that the ladybugs would be harmed. The rhyme reflects the hope that the ladybugs would leave while the fires burned, but would return again to help farmers control harmful insect pest.
- h. Read the poem *Hurt No Living Thing*, by Christina Rossetti (Core Knowledge Curriculum poetry integration). Students listen for all the living things named in the poem. List the insects. Invite students to state in their own words what the poet is saying about people's responsibility towards living things. Students can make posters in which they share their feelings about the poem's message. Suggest posters might want to show one thing people could do to help other living things survive.

M. Lesson 13: Language Arts integration, Sayings and Phrases, Poetry

1. Objectives/Goals

- a. To expose students to common sayings and understand their meanings; to poetry and prose.
- b. Students study interpretation, fluency and inflection when reading aloud.

2. Materials: List of sayings using insect terms:

*Busy as a bee.
Buzz off.
Make a beeline for the food.
You'll catch a bug.
You've got ants in your pants.
Don't bug me.*

Books and poetry about or highlighting insects.

3. **Key Vocabulary:** interpretation , literal
4. **Activities**
 - a. List sayings and phrases that use insects. Write the correct meaning for each on the sayings.
 - b. Think of a saying that insects might say about people. Draw pictures to match.
 - c. Share *Joyful Noise: Poems for Two Voices*, by Paul Fleischmn (Harper & Row, 1988). This is a collection of fourteen poems about different insects. Each poem was written for two voices. Divide class in two parts. Read poems aloud as a class.
 - d. Brainstorm with the class to create a list of onomatopoetic words for the sounds insects make, such as buzz, chirp, hiss, ping, and hum. Have students create their own insect poems that include words like these. Share poems with class or record them onto a class tape of insect poems.

N. Lesson 14: 3-Fold Insect Report - Project for Assessment

1. **Objectives/Goals**
 - a. Ability to identify insect characteristics. For a specific insect topic; how they are like other insects, how they are different.
 - b. Students select an insect to research. Using the 3-Fold Report format, students design and develop a report about the chosen insect topic.
 - c. **Skill Objective:** Information gathering, organization of information within specific project and presentation requirements.
2. **Materials:** 3-fold Report instructions, Addendum A. 12" X 18" construction paper, any color. 6" X 12" sheets of writing paper, drawing paper. Insect stickers or pictures mounted on index cards, labeled with insect name.
3. **Key Vocabulary:** topic, research, note taking fact, anatomy diagram
4. **Activities**
 - a. Show how to fold 12" X 18" construction paper to make a 3 fold booklet.
 - b. Allow students to select an index card with an insect topic.
 - c. Review organization of materials and expectations for final product.
 - d. List possible resources.

O. Lesson 15: Study Guide and Unit Assessment

1. **Objectives/Goals**
 - a. Students demonstrate mastery of important insect concepts.
 - b. Students use a study guide.
 - c. Students learn to study for a test.
2. **Materials:** A study guide provided by the teacher, Addendum B. Notes taken during unit instruction. Student booklet of activities, if available. Written Assessment written and provided by the instructor.
3. **Key Vocabulary:** All terms relating to the study of insects as listed on study guide.
4. **Activities**
 - a. Students take home all study materials.
 - b. Students take the written assessment.
 - c. Design and implement a chart to record student's progress and they complete the work for this unit on insets. Keep anecdotal records. Sticky note pads used of each observation. Note student name, date, incident and quick take on its implications. Stick notes inside a file folder, marked off with squares for each student. Topics might include:
 - interest and enthusiasm for topics and materials
 - quality of science journal entries
 - cooperation in working with others
 - understanding of concepts
 - response to literature

contribution to the unit of study

VI. CULMINATION ACTIVITIES

- A. Report/project presentations
- B. Foods made from Insect Products
 - 1. Ants on a Log - celery sticks spread with cream cheese, then dotted with raisins.
 - 2. Honey spread on graham crackers.
 - 3. Honey-flavored Drink.
 - a. For each serving: 1 cup skim milk, 1 tablespoon honey, 1/2 tablespoon vanilla, cinnamon. Heat ingredients slowly until warm. Pour into paper cups and sprinkle with cinnamon.
 - 4. A Taste of Honey
 - a. 1 cup honey, 8 tablespoons soft butter, 8 tablespoons whipping cream, 1 loaf of bread. Mix honey, butter and cream together. Spread on half of the bread slices. Cover with second slice making sandwiches. Cut bread into 1-inch strips. Place in toaster oven until they turn brown. Sprinkle with cinnamon.
 - 5. Candied Butterflies
 - a. Candied orange slices or gumdrops, small pretzels, a small amount of frosting, red licorice strings, different kinds of small candies. Cut two slits in each gumdrop or orange candy. This is the butterfly's body. Insert a pretzel into each slit. These are the wings. Add a jellybean or candy-corn head, using frosting to attach it. Use the licorice for antennae. Decorate butterfly back and wings with other small candies.
- C. Make a Bug Book
 - 1. Share *The Icky Bug Alphabet Book* by Jerry Pallotta (Charlesbridge, 1986) with the class and discuss it together.
 - 2. Have each child make his/her own bug book. Select a bug shape for the book and pages.
 - 3. Help students decide on a topic for their bug books. Ideas:
 - a. *Insects from A to Z.*
 - b. *The Strangest Insect I Ever Saw*
 - c. *Fantastic Facts on Insects*
 - d. *Interview with Interesting Insects*
 - e. *Why the Firefly Flashes and Other Insect Legends*
- D. Insect Origami
 - 1. *Origami Insects and Their Kin*, by Robert J. Lang, Dover Publications, 1995.
- E. Insect Games
 - 1. Insect Bingo
 - 2. Insect Relay Race
 - a. Students move like bugs.
 - 3. Build a Bug Puzzle
 - a. Students illustrate favorite insect. Cut into pieces of different shapes and sizes. Assemble puzzles.
 - 4. Cootie
 - a. Building a cootie (insect).
- F. Insect Science Fair
 - 1. Student demonstration of an experiment class completed during unit.
 - 2. Insect game booth.
 - 3. Labeled exhibits of class ant farm, butterfly garden, or pictures of these projects.
 - 4. Artwork booth.
 - 5. Book booth, student made books.

6. Flannel board display of insect parts.
- G. Make filmstrips and projectors to help retell stories such as *The Very Quiet Cricket*, by Eric Carle.
 1. Student color pictures in sequence on picture strips. Tape together, thread through milk carton slits.
- E. Entomologists in Action - Students pretend to be entomologists. Students describe and imaginary insect and give it a name. Create a diorama in a box to display their imaginary discovery.
- F. Field Trip
 1. Visit a local science museum or university.
 2. Visit a Butterfly Pavilion & Insect Center
 3. Children's Museum
- G. Video Party
 1. *Honey, I Shrunk the Kids*
 2. *James and the Giant Peach*
 3. *A Bug's Life*
- H. Beekeeper Guest
- I. Wall Mural
 1. Students work together to craft, draw or paint bulletin board display.
- J. Drama Presentation
 1. Save the Rainforest Play
 2. Aesop Fables: *The Ant and the Grasshopper*

VII. HANDOUTS/WORKSHEETS

- A. Appendices
 - Appendix A - 3-Fold Insect Report
 - Appendix B - Insect Study Guide
 - List of concepts to be mastered.
 - Appendix C - Written Assessment

VIII. BIBLIOGRAPHY

- Any Resources on Insects, any Theme Unit Books on Insects
- Beech, Linda Ward. *Integrated Theme Units: Insects*. Scholastic. 1992. ISBN 0-590-49310-8
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- Hirsch, Jr. E.D. *What Your Third Grader Needs to Know*. New York: Dell Publishing, 1992 ISBN 0-385-41117-0
- Mailbox Magazine (April/May 1996)
- Moore, Jo Ellen. *Animal Life Cycles*. Evan-Moor, 1994 ISBN 1-55799-093-X

A 3-Fold Book About Insects

Second Grade Project: Due April 30th (Wed)

Choose an insect to write about.

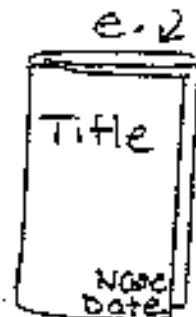
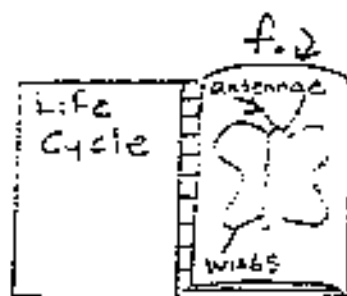
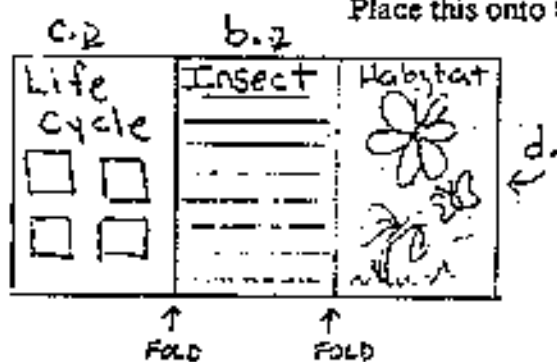
Materials: 12" X 18" construction paper, any color
6" X 12" sheets of writing paper, drawing paper

- Planning:**
- What will be the subject of your three-fold book? _____
 - What references will you use to gather your information?

 - Where can you find a picture of your insect to draw from?

Production:

- Read to find information about your topic.
Write 3 ways your insect is like other insects.
Write 3 facts that are special about your insect.
The writing may be done in a paragraph form or as a list.
A Fact is something that is true. You can prove it.
- Fold the construction paper into three sections.
Glue the writing paper in the center of the construction paper.
- Draw and label stages of your insect's life cycle.
Glue this onto the left side section.
- Draw a picture of your insect in its natural habitat. Label the picture.
Place this onto the right side section.



- Fold the construction paper over the writing paper.
The left flap is the cover of your book.
List the title, your name, and the date on the cover.
- Draw an anatomy picture of your insect on the right flap.
Label the body parts.

Addendum A



Insect Unit Study Guide

* Test Date: *Friday, May 22, 1998*

Insects belong to a large group of animals called arthropods.
All arthropods have jointed legs and a hard outer skeleton.
The study of insects is called entomology.
Scientists who study insects are known as entomologists.
Entomologists try to find out how insects behave and why.
Insects have been on earth longer than the dinosaurs.



All insects have a hard outer skeleton called the exoskeleton.
All insects have three main body parts.
The three main body parts of an insect are the head, thorax and abdomen.
All insects have 6 legs.
Insects feel and communicate with their antennae.
Insects move about by flying, hopping and crawling.
Most but not all insects have wings.

Ants and bees are social insects.
Social insects live in colonies.



Ants build their colony in the ground.
An ant colony has many rooms.
The queen ant lays all the eggs.
The worker ants take care of the colony.
There are three kinds of worker ants: nurse ants, food-gathering ants and soldier ants.

Honeybees live in a hive.
The queen bee lays all the eggs.
The larva of a honeybee looks like a soft white worm.
The pupa is a young bee that is almost full-grown.
A worker bee is female but she cannot lay eggs.
Male bees are called drones.
Worker bees gather pollen and nectar from flowers.
The honeycomb is made of wax.
Bees make nectar into honey.
A large group of bees is called a swarm.
We need bees to help pollinate plants for food and flowers.



Addendum B

Metamorphosis means change. It is the series of changes in shape and function that some animals go through from birth to adult. Also called the Life Cycle or the Circle of Life.

Incomplete Metamorphosis: when insects look like miniature adults when they are born from an egg, they molt to grow. (examples: grasshopper and dragonfly)

Molting is the shedding of the exoskeleton in order to grow a new, larger one.

Complete Metamorphosis: when insects go through distinct stages; egg, larva, pupa and then finally, the adult stage. (examples: ant and butterfly)

Complete Metamorphosis stages of a Butterfly:

First stage: egg

Second stage: egg hatches into larva called a caterpillar, is very hungry, eats and eats and grows

Third stage: caterpillar forms into a pupa called a chrysalis

Fourth stage: chrysalis develops, then opens and out comes the adult butterfly.

Insects can be helpful and harmful.

Helpful: pollination, products like honey, beeswax and silk, eat harmful insects

Harmful: destroy crops, trees and wooden buildings, clothes, carry disease, bite or sting

Spiders are not insects. They have too many legs (eight) and only two main body parts.



Addendum B₂

Insect Unit Assessment

Name _____

Use the word box to fill in the blanks.

Word Box

dinosaurs	arthropods	arachnids	eight
six	entomology	entomologists	biology
jointed legs	exoskeleton	colonies	spiders

1. Insects belong to a large group of animals called _____.
2. All arthropods have _____ and an _____.
3. The study of insects is called _____.
4. Scientists who study insects are called _____.
5. Insects have been on earth longer than _____.
6. Social insects such as ants and bees live in _____.

Write the answers to the questions. Use complete sentences.

7. How many legs does an insect have?

8. How many main body parts does an insect have?

9. Name the main body parts of an insect.

10. What does metamorphosis mean?

Addendum C

Draw an ant and label its parts.

11.

Choose the best answer. Circle, then write it on the line.

12. Insects move about by _____
running and skipping flying, hopping, crawling automobiles
13. Most but not all insects have _____
six legs sharp teeth wings
14. Ants and bees are examples of _____
social insects arachnids scavengers
15. Social insects live in _____
apartments colonies trees
16. Ants build their colony _____
in hives in the ground in trees
17. An ant colony has _____
honeycombs many rooms a hot tub

Addendum C₂

Write True or False.

18. *The queen ant lays all the eggs.* _____
19. *The worker ants lay the eggs.* _____
20. *Honeybees live in a swarm.* _____
21. *The queen bee helps gather food.* _____
22. *A large group of bees is called an army.* _____
23. *There are three kinds of worker ants.* _____
24. *Male bees are called drones.* _____
25. *Worker bees gather honey from flowers.* _____
26. *The honeycomb is made of wax.* _____
27. *The pupa is an adult bee.* _____
28. *Bees are helpful insects.* _____
29. *Bees make nectar into honey.* _____
30. *Write two ways insects are helpful. Use complete sentences.*
 1. _____
 2. _____
31. *Write two ways insects are harmful. Use complete sentences.*
 1. _____
 2. _____

Draw lines to match the stages of the butterfly life cycle.

First Stage

Caterpillar forms into a pupa called a chrysalis.

Second Stage

Chrysalis develops, then opens and out comes the butterfly.











Third Stage

The egg is laid on a leaf.

Fourth Stage

The egg hatches into larva called a caterpillar.

36. Label the following: *Incomplete change, Simple change, Complete change*

Insects develop from an egg into an adult in three ways:				
 egg	 young	 adult	As the insect grows, only its size changes. This is how a silverfish develops.	
 egg	 young	 adult	As the insect grows, it changes in size and develops wings. A grasshopper develops this way.	
 egg	 larva	 pupa	 adult	The adult insect looks very different from the young insect. This is how a butterfly develops.

Bonus: Name one interesting fact about the insect topic of your report. Be sure to tell which insect you are talking about.

Addendum C4