



Fun with Magnifiers

Created by
Chrissy Cowan, TVI
TSBVI Outreach Department

Fun with Magnifiers

This magnifier unit is designed to pique the interest of the kindergarten-junior high student with low vision, teach concepts which may be incomplete due to the sensory deficit, and provide extended activities in an effort to challenge children and expand the transfer of magnifier skills. The magnifier(s) recommended for these activities include any combination of a hand held magnifier (preferred), stand magnifier, or microscopic lenses. The ultimate goal of magnifier use is increase the student's access to the wide array of visual materials, including objects, pictures, and print.

Fun with Magnifiers is divided into 8 stand-alone units that can be taught by teachers of students with visual impairments, classroom teachers, and/or parents. Since some children are sensitive to being the only child using a magnifier in their classrooms, these units might be more successful if arranged in a learning center for all classmates to use. Other alternatives might involve having the student present a completed unit project of his/her choice to the class or to a class of younger students during a science lesson. Each unit includes optional activities that are designed to provide enrichment and higher order cognitive skills. Please note that some of the units involve using print books/materials to help classify objects. The intention of using actual books (rather than a website) is to provide further experience with print size, contrast, color, and photos.

Contents

Unit 1 : Oh...So that's What It Looks Like! Introduction to a Variety of Objects	2
Unit 2: I Hope There's Nothing Still Alive in There! Exploring Shells	3
Unit 3: Do You Think This Is Worth Something? Exploring Rocks.....	4
Unit 4: How Old Is This? Exploring Fossils.....	5
Unit 5: My Grandfather Used to Collect These. Collecting Stamps	6
Unit 6: This Doesn't Bite, Does It? The World of Insects	7
Unit 7: We Have These All Over Our Back Yard. Classifying Wildflowers.....	8
Unit 8: Crime Scene Investigation. Exploring Fingerprints	9

Unit 1 : Oh...So that's What It Looks Like! Introduction to a Variety of Objects

Objective: The student will become familiar with the magnification capabilities of a magnifier.

Materials: Hand held magnifier
Lamp (optional)
Feathers, leaves, cloth, seeds, money, animal hides, marbles, sticker burrs

Lesson: Allow the student to investigate the materials without the magnifier. Introduce the magnifier, develop a working focal distance, and look at the materials again. Discuss properties and details of each object.

Going

Beyond:

1. Make a list of objects you would like to be able to see better
2. Investigate and make a list of objects which benefit from magnification in the classroom, kitchen, and bathroom
3. Write a story about a child who uses a magnifier in some way
4. Bring objects to school which can be seen better through a magnifier
5. Research the properties of magnification, magnifying tools and their uses
6. Make a drawing of something observed through a microscope
7. Research how the microscope has benefitted mankind

Unit 2: I Hope There's Nothing Still Alive in There! Exploring Shells

Objective: The student will use a magnifier to closely inspect and classify shells and shell structure.

Materials: Hand held magnifier
Lamp (optional)
Variety of shells, including a cross section shell identification book

Lesson: Look at shells through the magnifier and make a list of the properties, e.g., color; qualities of shapes—round, flat, spiral, bi-valve; size, texture. Use a shell identification book to locate the shell name according to the physical properties.

Going Beyond:

1. Make a display of labeled shells
2. Design a shell creature using glue, shells, and any adornments
3. Create a useable product with shells (e.g., shell mirror, shell refrigerator magnets, etc.)
4. Attach pins on a map to locate shell origins
5. Design an art project based on shell structure, but not using an actual shell (e.g., shell pattern quilt square)
6. Find other objects of nature which are based on the spiral pattern
7. Research the practical uses for shells by past and present civilizations. Illustrate and/or write a summary
8. Create a shell tool and explain its use. Compare it to a modern tool if applicable

Unit 3: Do You Think This Is Worth Something? Exploring Rocks

Objective: The student will use a magnifier to inspect and classify rocks.

Materials: Hand held magnifier
Lamp (optional)
Rocks from a variety of geographical locations
Rock identification book or website

Lesson: Encourage the student to inspect the rocks displayed on a table without a magnifier. Introduce the magnifier and point out distinguishing details (e.g., crystalline fragments, grain size, rounded shape grains, angular shaped grains, dark and light banding or layering, color etc.) Introduce the concept of the three rock types: Igneous, sedimentary, and metamorphic. Ask the student to select one rock. Using a website for “identifying types of rocks”, first identify the rock type and use the specific rock type keys (igneous, sedimentary, and metamorphic) to identify the specimen more accurately.

Going Beyond:

1. Construct a rock collection of the labeled rocks in an attractive display.
2. Using the route between your home, school, and the grocery store, describe the uses for rocks you see in your immediate environment.
3. Using a microscope, draw the more detailed textures of rock fragments.
4. Use several different colors of clay to construct a cross-section model that demonstrates layering (rock stratification) under the earth’s surface.
5. Research and write a report about the usage of rocks in society. Some major categories might include the usage of rocks in the field of medicine, in building trades, as fuel, in clothing, in art, or as weapons.
6. Hypothesize what might happen if the usage of rocks in any one of the areas listed in #5 reached the stage of depletion. What method or material would you develop for a substitute? (E.g. solar power instead of burning of fossil fuels)
7. Pretend you are a Native American child who has no toys or games other than those you devise out of natural materials. Invent a game using rocks (in addition to other natural materials if needed). Describe or write out the rules to your game, draw a picture of it, and demonstrate it to another person.
8. Choose an era of rock formation and illustrate the flora and fauna of that era.
9. Research the use of rocks as tools and write a report or use a chart format to summarize your findings.
10. Create a new tool using a rock (other natural materials may be included) Explain the purpose of your tool and make a drawing.
11. Research the formation of crystals. Find and follow instructions on setting up your own crystal formation experiment (use science experiment books as references if needed). Devise a method to record your daily observations.

Unit 4: How Old Is This? Exploring Fossils

Objectives: The student will use a magnifier to inspect and classify fossils.

Materials: Hand held magnifier
Lamp (optional)
Variety of fossils
Fossil identification book
Geographical time-scale

Lesson: Allow the student to look at the fossils as they are spread out on a table. Use the magnifier to inspect and discuss critical features which allow us to distinguish between classes of fossils. Some of these features include: radial symmetry, pores, bilateral symmetry, tube-like chambers. Use the identification key of the fossil book to locate a page number for a pictorial representation of the fossil.

Going
Beyond:

1. Once a fossil has been identified, locate the period of time it appeared on earth and chart this on a geological time-scale.
2. Draw a picture of what the fossil may have looked like in its living state (before it was a fossil).
3. Illustrate what the earth may have looked like during the period in which some fossils were formed.
4. Imagine you have gone back in time in a time machine. Write a story about what you might see during the Mesozoic Era.
5. Step into your time machine and zoom 2000 years into the future.
 - Describe what “fossils” you might find and illustrate or write a descriptive narrative of what you might see around you.
6. Construct a prehistoric scene inside a shoe box using cut paper scenes along with molded clay figures and/or small models. Make light-colored tissue paper “windows” in the top of the box for extra light. Replace the top on the box, cut a hole in one end of the box, then peer through the hole at your scene.

Unit 5: My Grandfather Used to Collect These. Collecting Stamps

Objectives: The student will use a magnifier to inspect and identify postage stamps.

Materials: Hand held magnifier
Lamp (optional)
Stamp collection kit (look up “Stamp Collecting Kits). Here are 2 typical websites for finding these:

- <http://www.domagron.com/category/STAMPS.html>
- https://www.amazon.com/U-S-Stamp-Collecting-Starter-Kit/dp/B009L3M84S/ref=pd_sim_14_7?encoding=UTF8&psc=1&refRID=48545SWW6M86J40TFW7F

Lesson: Using the American Philatelic website as a resource (<http://stamps.org/A-Hobby-for-Everyone>), discuss the hobby of collecting stamps, the purpose of stamps, and distinguishing features (e.g., country of issuance, denomination, topic, perforations, and color). Allow the student to review a stamp collection kit book and discuss its topic. Using a magnifier, the student should inspect the black and white photo of the stamp required on the first page of the stamp book, then select the actual stamp from a group of stamps spread out on a table. Reduce the number of stamps to choose from at first to make this task easier. Affix the correct stamp to its corresponding position in the book according to the directions given with the kit. Ask questions concerning critical features of the stamp to determine the student’s proficiency in using the magnifier. As this is an intense visual task, the student may only be able to do a few stamps at first until stamina is developed.

Going Beyond:

- 1 Select 2-3 stamps and find the country or countries that uses the stamps on a globe or a flat map and mark the locations with pins.
- 2 Imagine your own country. Design a stamp which is meaningful to your country.
- 3 Make your own album with a 3-ring binder and blank paper. Collect stamps from your parent’s mail and/or ask local businesses for their discarded stamps. Display these stamps in your album.
- 4 Pick a U.S. stamp and research the historical significance of the stamp.
- 5 Choose your favorite sport, hobby recreation, and/or current historical event and design a commemorative stamp.
- 6 Research the invention and purpose of stamps and predict what might have happened if this system was never developed.

Unit 6: This Doesn't Bite, Does It? The World of Insects

Objective: The student will use a magnifier to inspect and identify insects.

Materials: Hand held magnifier
Lamp (optional)
Collection of assorted insects (either dead, or sealed inside a collection jar)
Insect identification book

Lesson: Allow the student to inspect the insects without a magnifier. Introduce the magnifier and discuss observable features (e.g. number of legs, number of body parts, presence of antennae, color, texture, spots, stripes, size, wings, stingers, etc.) Assist the students in using a table format to record the features. Assist the student in determining which order of insects each specimen belongs to (use a table of insect order found in the identification book). Using the information from a table of insect orders, refer to the page numbers listed to find a photograph of the insect.

Going Beyond:

- 1 Research insects which are harmful to humans and animals. Write a short report of your findings.
- 2 Research insects which are beneficial to humans and animals. Write a report of your findings.
- 3 Construct an insect habitat.
- 4 Collect insects from your neighborhood and classify these.
- 5 Once you have classified at least 10 insects, create a display of them with labels. Either draw the insect, or pin the insect to a board.
- 6 Draw a series of cartoons based on insect characters.
- 7 Imagine yourself as an insect. Write or role-play your reaction to someone who is trying to kill you.
- 8 Imagine you woke up one morning in the form of an insect. Relate your experiences and peoples' reactions as you follow your normal daily routine. Record these experiences in writing or cartoons.
9. Predict what the world would be like without insects. Illustrate or write a story.
10. Construct your own (imaginary) 3-dimensional insect out of clay, soap carving, junk parts, etc. Tell whether your insect is beneficial or harmful and support your decision with examples of its behavior.
11. Interview county extension agents, horticulturists, and/or organic gardeners to determine non-chemical ways to control insects. Using your information, write a short report (similar to a newspaper article) to convince homeowners of the long term and short term benefit of non-chemical insect control.
12. Make a drawing which depicts the underground habitat of an insect.
13. Speculate why insects use camouflage. Illustrate camouflaged insects.

Unit 7: We Have These All Over Our Back Yard. Classifying Wildflowers

Objective: The student will use a magnifier to inspect and classify wildflowers.

Materials: Hand held magnifier
Lamp (optional)
Variety of preserved wildflowers
Wildflower identification book

Lesson: Allow the student to inspect a wildflower without a magnifier. Introduce the magnifier and look more closely at petals, leaves, and stem. Help the student determine distinguishing characteristics (e.g., number of petals; flower groupings- single double, loose/tight clusters; leaves-toothed/smooth, opposing/alternating; stem-smooth/hairy etc.) Record the information for each specimen on a chart. Look through the identification book to find the photo of each specific specimen. Note: guides which are color coded to correspond with flower colors are easier to use.

Going Beyond:

1. Collect your own wildflowers and preserve them by using a book press method or ironing them between two pieces of wax paper. Label your specimens.
2. Design a new flower by combining parts of other flowers. Make up a name for your new flower.
3. Design an art project based on wildflower structure, but not using an actual flower.
4. Research the beneficial medicinal uses of wildflowers by interviewing an herb specialist or through library research. Record your findings in chart form or written report.
5. Research wildflowers which are poisonous for humans and animals. Speculate why certain plants are poisonous.
6. Describe the relationship between wildflower and the creatures that pollinate them.
7. Design and graph a wildflower garden around a building (or structure).
8. Speculate why wildflowers are heartier than hybrid flowers.

Unit 8: Crime Scene Investigation. Exploring Fingerprints

Objective: The student will use a magnifier to distinguish fingerprints.

Materials: Hand held magnifier
Lamp (optional)
Ink pad with dark-colored ink
White paper

Lesson: Allow the student to investigate his/her fingers with a magnifier for ridges. Explain the physical occurrence of and reason for the ridges. Firmly press the student's finger on the ink pad and make a finger print impression on a white sheet of paper (do not use construction paper). Make a print of the teacher's finger. Ask the student to use the magnifier to compare fingerprints and pick out his/her own.

Going Beyond:

1. Create imaginary characters out of fingerprints by adding features to the prints with a pen (e.g., ears, clothing, eyes, etc.).
2. Make up a cartoon sketch or story using fingerprint characters.
3. Visit the fingerprint specialist in the police criminology unit. Prepare a list of questions you would ask him/her in regards to (1) how finger prints are lifted from surfaces, and (2) how they are used to track down criminals.
4. Research to find out why no two fingerprints are alike, and why humans have ridges on their fingers.
5. Write a mystery story in which the criminal is detected because of the prints he left at the scene of the crime.
6. Make two sets of fingerprints of all five of your fingers. Cut each print out and glue them to a 2x2 inch card (10 cards in all). Make a concentration (matching) game with your prints.
7. Get together with a few classmates to make thumbprints. Exchange the prints and let them use your magnifier to match them back up their original owners.
8. Sherlock Holmes was noted for using very subtle clues to solve mysteries. Read a Sherlock Holmes story and make a list of the clues he used.
9. Besides fingerprints, list other characteristics distinguish us as individuals.