

Exploring Nature with Children

A Series of Nature Activities for Grades 1-4



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Description of Target Ages and Grade Levels - The following activities have been designed for lower elementary grades 1-4, but could be easily adapted for higher grade levels.

Purpose – For a Christian, exploration and interaction with nature provides opportunity to renew the soul and connect with the Creator of the universe who has promised that “Since the creation of the world God’s invisible qualities— His eternal power and divine nature—have been clearly seen, being understood from what has been made, so that men are without excuse” (Romans 1:20). Ellen White in the book *Education*, wrote that the study of nature is a means of understanding the Creator and a vehicle for developing young children into lifelong learners. “To a little child, nature presents an unfailing source of information and delight. . . So far as possible, children from their earliest years should be placed where this lesson book is open before them. Let them look at the glorious scenes painted by the great Master Artist on the shifting canvas of the heavens; let them become acquainted with the wonders of earth and sea; let them watch the unfolding mysteries of the changing seasons and in all His works learn of the Creator” (p.60). It is with this purpose that the following three mini-units have been designed: to help provide you as a teacher a means of providing an opportunity for students to get out and explore the wonderful world God has created.

How-To-Guide – Each of the following three nature themes is built around a central exploration activity. This activity is used as a basis for integrating other areas of the curriculum. Units are designed to be used as a “theme for the day.” Although the individual activities could be used on their own- the flow of the activities is designed to take you through one complete school day beginning with worship and ending with Bible. If you are not able to do these activities on your school grounds, take a field-trip to a park or natural reserve where students can enjoy the experience of being in nature!

SPECIAL NOTE: All graphics will also print as black and white images. If you are using an inkjet printer, you may want to adjust your printer’s settings to print only black and white to conserve ink. On most printers this can be done by clicking the properties button just before you finalize the printing.



THEMES

TREES

Object Lesson - Healthy Trees, Healthy Christians

Nature Exploration - Look, Listen, and Feel

Language Arts – Making Sense of Trees

Bulletin Board – Tree-Mendous Descriptions

Math – Shaping Up

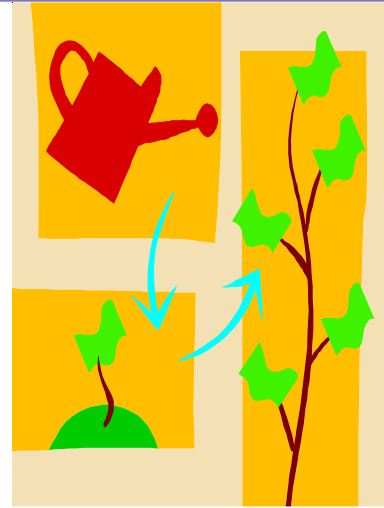
Art – Leaf Banners

Drama – The Life of a Tree

Bible – A Tree Is Known by Its Fruit

Branching Out - Extension Activities

Activity Pages -



INSECTS

Object Lesson - The Diligent Ant

Nature Exploration - Insect Hunt

Reading - What Is an Insect?

P.E. / Music - Bug Cadence

Art - Model Insects

Math - Hide and Seek

Multi-Grade Activity - Scavenger Hunt

Bible - Release Ceremony

Bug Off - Extension Activities

Learning Centers -

Activity Pages -



PUDDLES

Object Lesson - Designed to be Different

Nature Exploration - Puddle Profile

Bulletin Board - Puddle Puzzlers

Science - Staying on Top

Science - Will It Sink or Will It Float?

Art - Float Your Boat; **Bible** - Wind and Waves Obey

Social Studies - All The Water In The World

P.E. - Water Cycle Tag

Bible - Watery Charades

Puddle Jumpers - Extension Activities

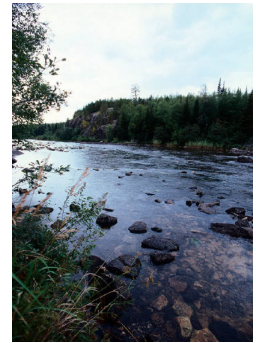
Activity Pages -





Object Lesson – Healthy Trees, Healthy Christians

“Happy is the person who doesn’t listen to the wicked. He doesn’t go where sinners go. He doesn’t do what bad people do. He loves the Lord’s teachings. He thinks about those teachings day and night. He is strong like a tree planted by a river. It produces fruit in season. Its leaves don’t die. Everything he does will succeed.” Psalm 1:1-3

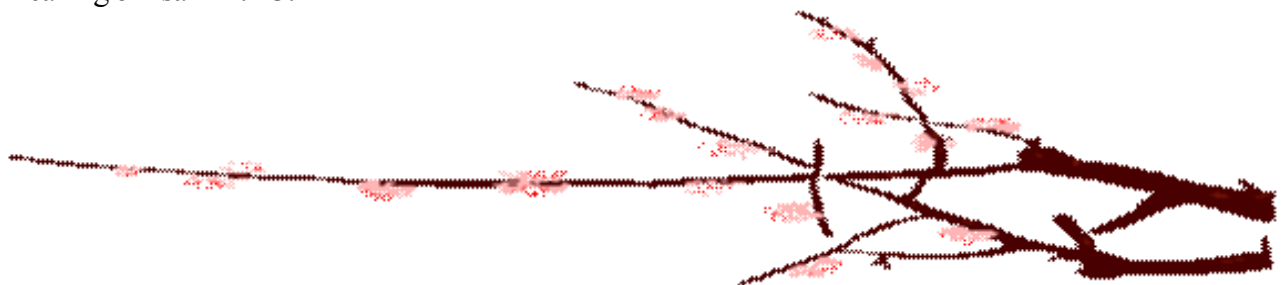


Materials: a dead branch preferably with dead leaves on it and a branch that has fresh living leaves. *If weather permits take students outside and sit under a tree while giving this lesson.*

Show children the branches and explain that you are going to allow 30 seconds (or longer if necessary) for them to examine the branches.

After the time is up ask students to share what they notice about these two branches. If necessary prompt them by asking, How are they different? Once the connection has been made that one branch is dead and the other is not. Have students think about what might cause a branch of a tree to wither and die. (It becomes cut off, disease, temperatures, insects, fungus, etc. . . .) Then ask students to think about what a tree needs to grow strong and healthy (sunlight, water, good soil, nutrients).

Explain that the Bible uses an illustration of a healthy tree to describe a person who obeys and follows God. Read Psalm 1:1-3 from the ICB. Show students the live tree branch and ask them to think of some things that would help a person grow into a strong and healthy Christian. Next bring out the dead looking tree branch and ask students to think of some of the things that Satan might tempt a person to do that would be harmful to a growing Christian. Tie these thoughts in with the meaning of Psalm 1:1-3.

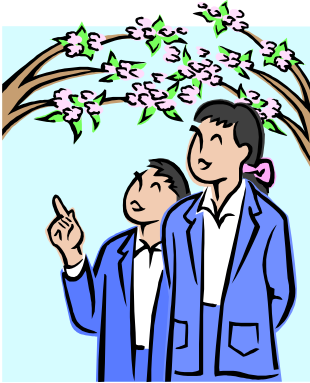


Nature Exploration - Look, Listen, and Feel

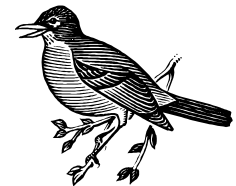
Preparation: Take a look around your school yard and select a tree or several trees close together that would be appropriate for students to explore. Before taking students out review behavior expectations and give a brief overview of the activity.



Outdoor Activity: As you and your students walk towards the tree or trees you have chosen to study have students compare the height of the



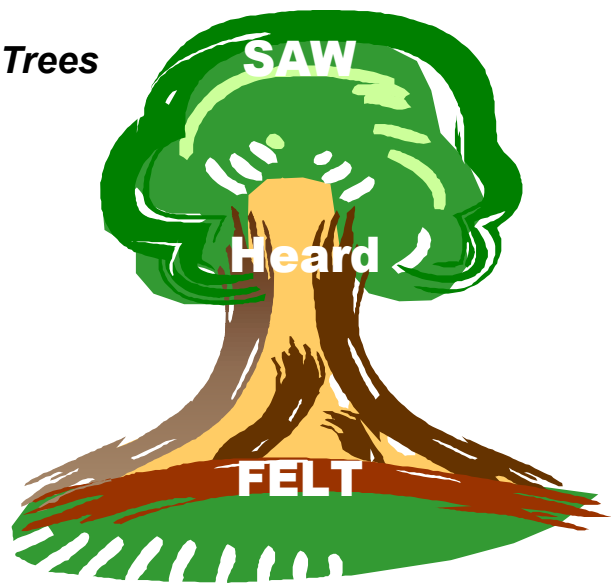
tree to surrounding trees or objects. Have students try to mimic the shape of the tree using arms and body. Once you are underneath the tree encourage students to observe using the senses of sight, touch, and sound. Encourage them to explore how the tree feels (leaves, bark, roots, ground around it, and temperature of the air). Ask students to describe the bark, the leaves, shape of the tree, and its habitat. Hold a minute of silence to listen for the sounds associated with the tree (leaves rustling, limbs creaking, chipmunk chattering in the branches). If you are doing this with older students you might have them explore the tree first with a blindfold on and then take it off to do the visual observations. Help students make detailed observations by asking them to look at the tree from different perspectives. *If you were a*



squirrel what would you see? Feel? Pretend you are an ant on the ground underneath the tree tell me what you would see? What if you were on the tree trunk? Close this activity by explaining to students how naturalists use all of their senses when making observations of things in nature. Discuss how being a careful observer is an important skill.

Language Arts – Making Sense of Trees

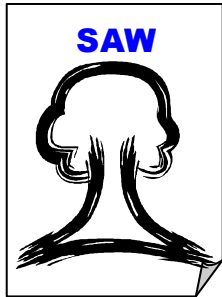
Grades 1&2: On a large sheet of chart paper draw an outline of a tree. Ask students to recall the words they used to describe the tree they explored outside. Then either designate parts of the tree for each type of sense: sight, sound, touch, or write the words on small strips of paper. If you write them directly on the tree then engage students in identifying which category the word belongs under. If you choose to use strips of paper (after writing down all the descriptive words suggested by the students) hand out the strips of paper and ask students to tape them to the appropriate branch/part of the tree. Once the tree has been completed, discuss the word placements with students. This is a great time to teach a mini-lesson on describing words-adjectives.



Language Arts Activity Continued – Making Sense of Trees



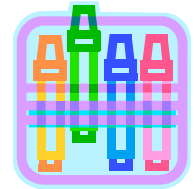
Grades 3& 4: In three separate areas of the room, place a sheet of chart paper with a large outline of a tree labeled with one of these headings- SAW, HEARD, or FELT. Divide



students into three groups giving each group a different colored writing tool.

Assign each group a station and on a given signal give the students one minute to write down as many describing words (about the tree they explored) as they can under their particular category. At the end of one minute, have groups rotate to the next station and repeat the same *procedure. Do this one more time so that each group has had the opportunity to write on all three charts.

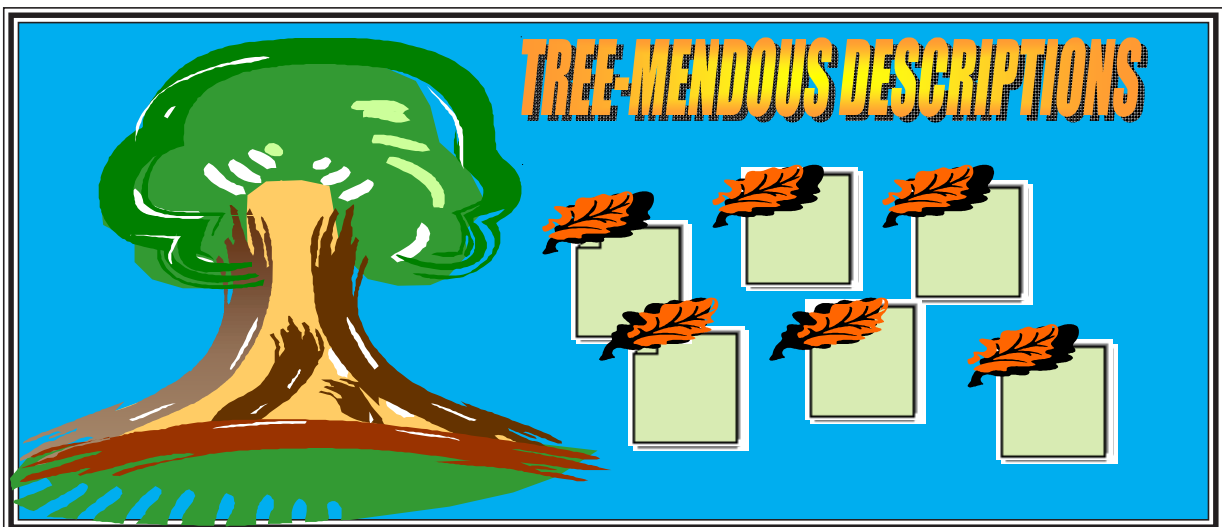
Each chart should have three separate colors of writing on it. **Once the final rotation is complete, have the groups share their observations from the charts with the whole class.



Discuss the results and the importance of developing sharp observations skills. *Note- you may want to stipulate that groups can only write down descriptions not used by a previous group. **If you want to attach point value to this activity- give groups a point for each describing word they write down on charts.

Multi-grade option: This second activity can be used in classrooms where there are older students who can be assigned the role of scribe.

Bulletin Board - TREE-MENDOUS DESCRIPTIONS

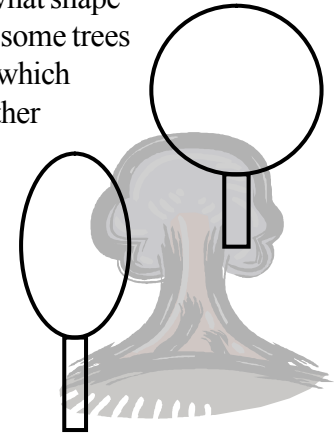
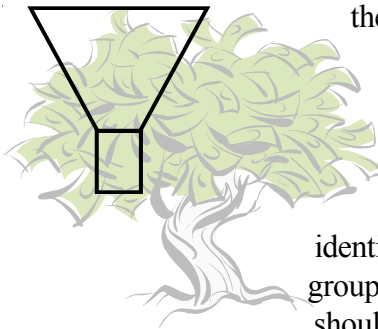
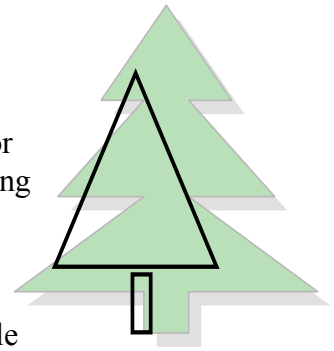


Use the *Tree-mendous Descriptions* writing activity pages as an extension of the Language Arts Activity. Students in Grades 3 & 4 can revise and edit the bonus paragraphs they wrote on the backs of the *Look, Listen, and Feel* activity page. Once students have completed their descriptions post them on a Bulletin Board decorated with a large tree. Give each student a leaf to write their name on and staple it to the top of their

Math – Shaping Up

Materials: A variety of trees, copies of *Shaping Up* activity page, clipboards or squares of cardboard (stretch rubber bands across to hold paper down) for writing a surface. Take students out into school yard or a piece of property that has a variety of different trees.

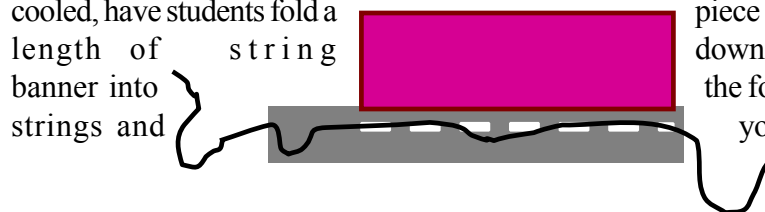
Activity: Explain to students that if they step back and look at trees from a little distance they can see their overall shape pattern. Choose a tree and have students trace the outline of the tree with their fingers. Then ask students to identify what shape they think the tree is. It would be helpful to start with some trees that are fairly obvious examples; such as small firs which have triangular shapes. Repeat this with several other examples so that students have identified the three basic shapes, triangle, up-side down triangle, and circle. Once students have gotten the hang of identifying tree shapes, let students work in pairs or small groups and assign them a plot of land to inventory. Data should be recorded on *Shaping Up* activity page.



Art – Leaf Banners

Materials: Wax paper, construction paper, leaves, Iron, towel, string. (leaves and wildflowers collected by students) *This project requires the use of a hot iron. If possible have an ironing center set up away from the student activity. Only the Teacher or an Adult volunteer should use the iron.

Directions: Decide how long you would like the finished banner to hang. Then in advance cut lengths of wax paper 2 x the finished length. Have students collect a variety of leaves and/or wildflowers from appropriate places outdoors. Once students have a small collection give each child a sheet of wax paper folded in half. Have students open the sheet and arrange their leaves and flowers on the bottom half. They can add bits of colored construction paper or crayon shavings as well. They should make sure to leave some space in between items so that the banner will seal properly. Once they have arranged the leaves to their satisfaction have them fold the top down onto the bottom half. Then using a stiff piece of cardboard or book transport the banner to the Ironing center* Place a light cloth over the wax paper and iron until the wax paper fuses together. Once the paper has cooled, have students fold a piece of construction paper in half then glue a length of string down the center fold. The staple or glue the the folded piece of construction paper. Tie the your banners are ready to display!



Bible – A tree is known by its fruit

Scripture Texts: Luke 6:43-45 & Galatians 5:22-23

Materials: acorn, pine cone, apple, pear, orange banana, or any kind of fruit easily available and recognized by students.

Supplementary Materials: *Hide 'Em In Your Heart: Bible Memory Melodies*, Vol. 2 by Steve Green Song # X, *The Fruit of The Spirit*.



“A good tree does not produce bad fruit. Also, a bad tree does not produce good fruit. Each tree is known by its fruit. People don’t gather figs from thornbushes. And they don’t get grapes from bushes. A good person has good things saved up in his heart. And so he brings good things out of his heart. But an evil person has evil things saved up in his heart. So he brings out bad things.” Luke 6:43-45 ICB



Show students the different kinds of fruits and nuts and ask them to identify the trees that they come from. Talk to students about how it is easy to identify a healthy apple tree or a healthy orange tree because these trees will have lots of good fruit growing on them. Remind them of the lesson about the

branches. Explain that the Bible says that just like it is easy to identify a healthy tree by the fruit that it bears, a person who has asked Jesus into their heart will be developing the Fruits of the Spirit. Read Galatians 5:22-23. **Note-You may want to use a version other than ICB. This version does not use the phrase “Fruit of the Spirit.”* Discuss the meaning of each Fruit of the Spirit.



Hand out **Bible Activity Page I & II** to first and second graders and **Bible Activity Page III** to third and fourth graders.

Branching Out - Suggestions for Extending Your Study

- Make bark rubbings
- Figure out the height of a tree
- Take a walk and identify the different kinds of trees
- Look for trees that are homes for animals
- Find out how old a tree is
- Research tree products



Drama - The Life Cycle of a Tree

Grades 1&2 - Have students act out the life cycle of the a

tree: a seed (curl up in a ball), a sprout (raise one arm), a sapling (raise two arms and wiggle fingers for leaves),



a mature tree (stand tall, arms out,

feet spread apart, wiggle your toes for roots, get hit

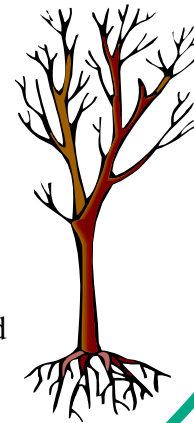
by lightning, become home for wildlife), a dead tree (woodpeckers are knocking), a rotting log with plants and insects (lie down), a new sprout from the rotting wood (raise one arm).



Grades 3&4 - Discuss the life cycle of a tree. Have students make a list of the parts of the life cycle all trees would have in common. Then brainstorm the parts of the cycle that might

differ from tree to tree (i.e. drought, fire, wind-storm).


Have students work in pairs, using the activity page, to develop a flow chart for the life cycle of a tree. Once they have completed the flowchart, they should decide on an action to represent each stage of the cycle. Practice and Perform!



Look, Listen, and Feel


Directions: In this activity you will use your senses to observe and describe a tree. Once you have been assigned a tree, take a few minutes to look at it from all angles: touch it, listen for sounds, notice the smells. Then in the boxes below begin writing down words and phrases that describe the things you see, hear, feel and smell.

What I See



What I Hear

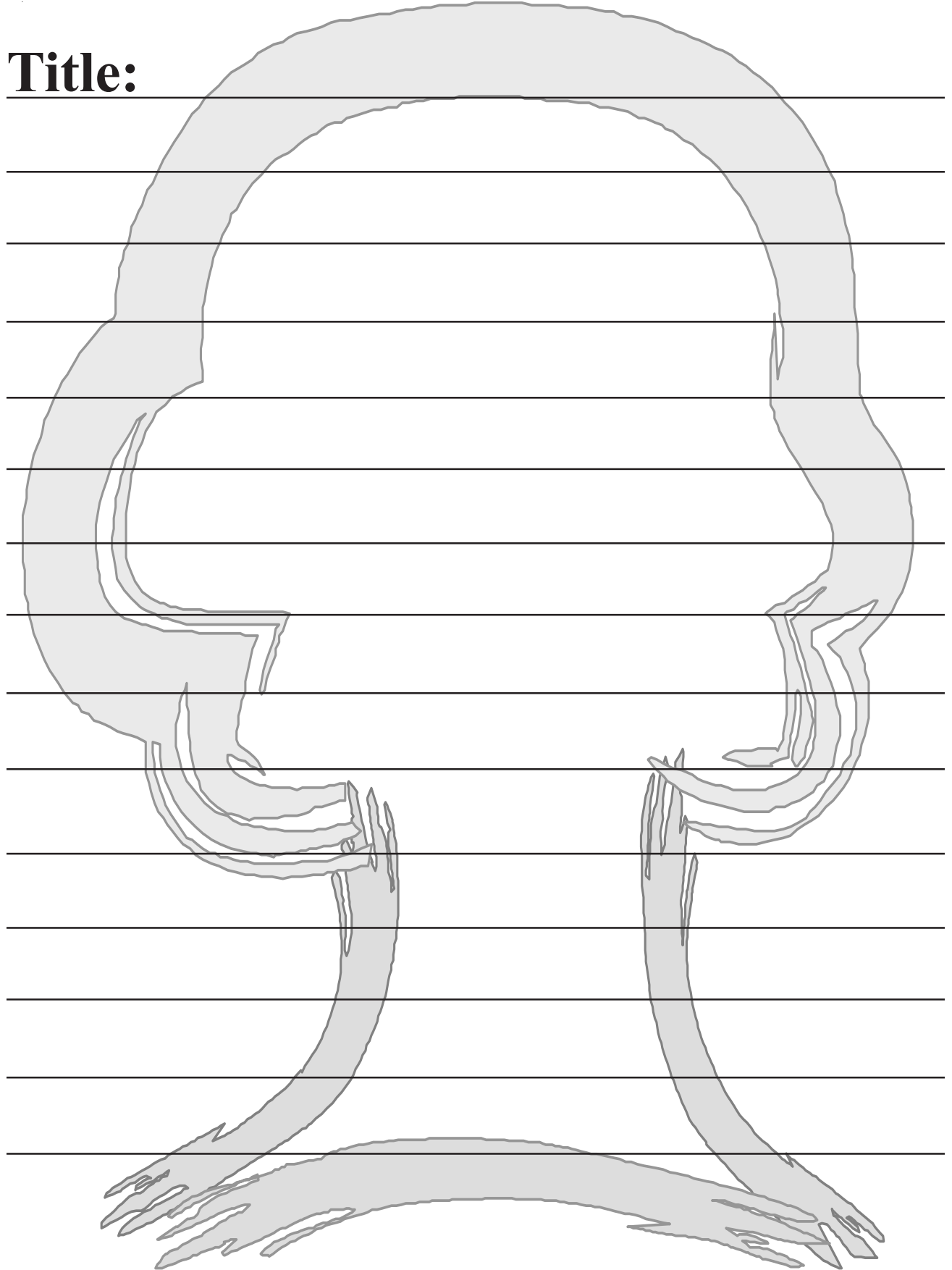
What I Feel



What I Smell

BonusBox: Choose a tree in an area designated by your teacher. Take a few minutes to observe the tree. Then on the back of this paper write a paragraph describing your tree, including at least one sentence for each of the four senses. When you have finished give your paragraph to a friend and see if they can find your tree!

Title:



Title:

My tree is

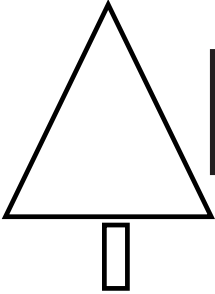
I can hear

It feels

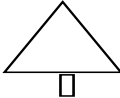
Name: _____

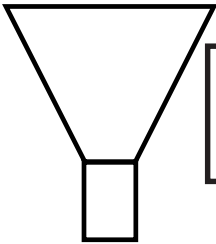
Shaping Up

Directions: Look at a tree. Fill in a box next to the shape that most looks like the tree. Then write the total number of trees on the blank line below the boxes.

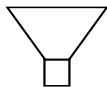


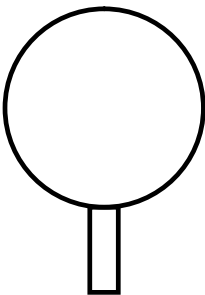
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There are _____  shaped trees.




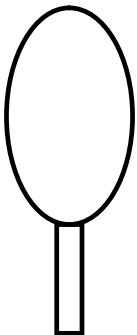
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There are _____  shaped trees.

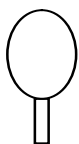


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There are _____  shaped trees.



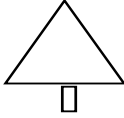
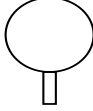
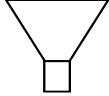

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There are _____  shaped trees.

Name: _____

Shaping Up

Directions: Use the frequency table below to record data as you survey the tree shapes in your designated study area. For example, each time you determine a tree has a triangular shape you would place a tally mark in the box that represents that shape. When you have completed your survey count up the tally marks for each shape and record that number in the frequency box.

	Tally	Frequency		Tally	Frequency
	Tally	Frequency		Tally	Frequency

.....

Graph It

Directions: Using the data from the frequency table create a bar graph that shows the number of different tree shapes in your study area. Then on the back of your paper write down two conclusions you can make based on the information in this graph.

Title:



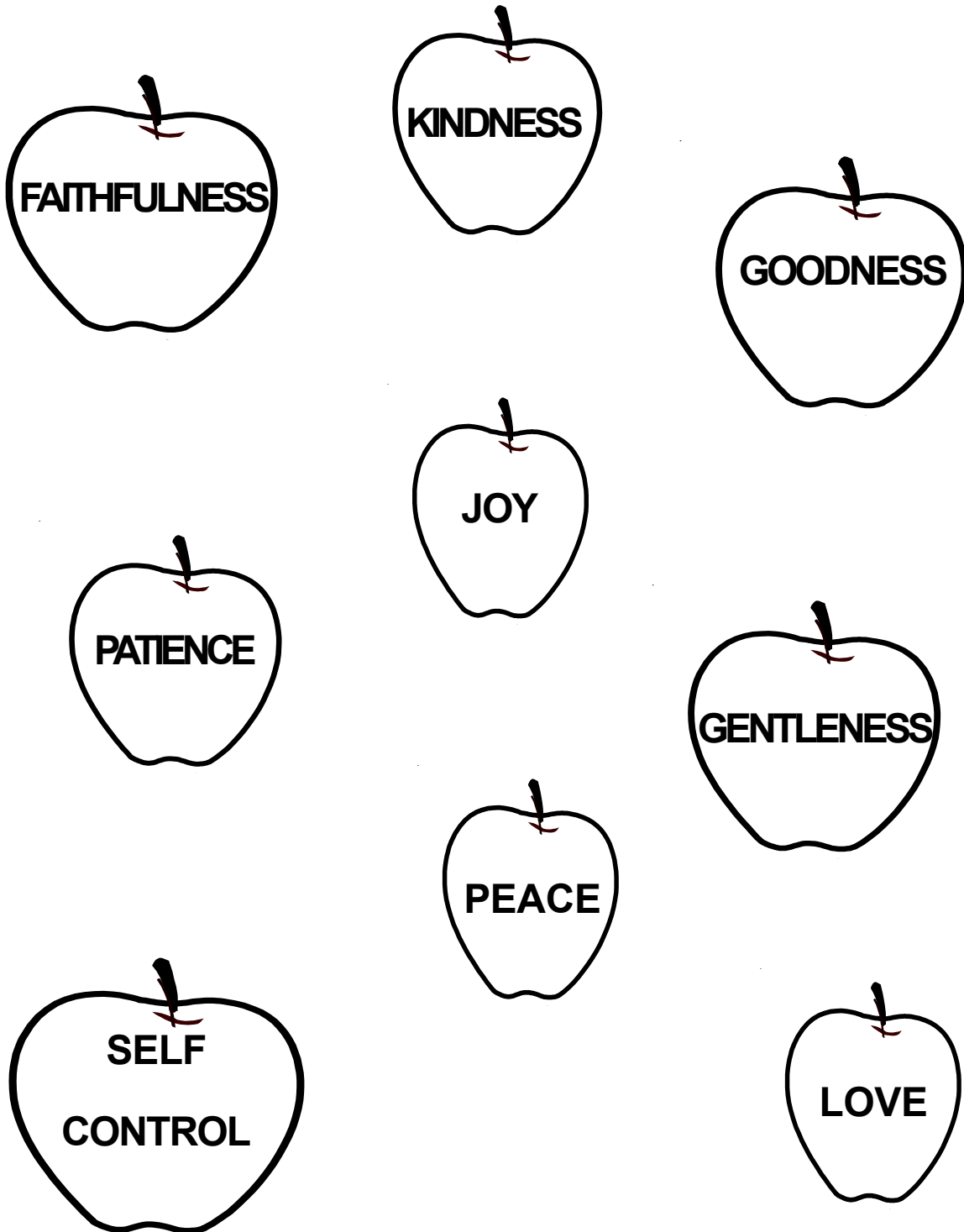
Name: _____

The Fruit of The Spirit



The fruit of the Spirit is love, joy, peace, patience, kindness, goodness, faithfulness, gentleness, self-control. Galatians 5:22-23.

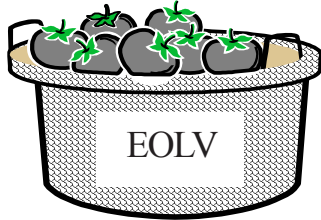
Directions: Color the tree. Color and cut out the *Fruit of the Spirit* apples.
Paste the fruit on the tree.



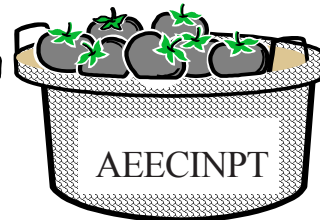
Name: _____

The Fruit of The Spirit

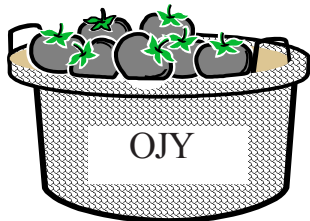
Directions: Unscramble the letters to find out which Fruit of the Spirit has been written on each basket. Once you have unscrambled a word write it on the top line underneath its basket. After you have unscrambled all the baskets, use the word bank below to find two more synonyms for each Fruit of the Spirit. Write them on the remaining two lines.

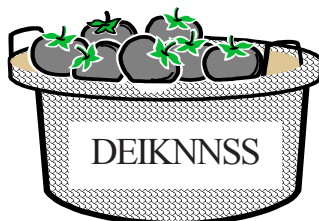
















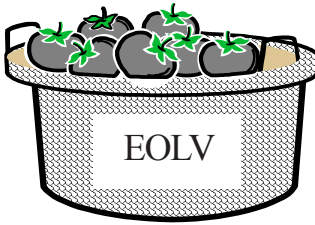
ADORE COMPASSION DELIGHT DEPENDABLE
 DISCIPLINE ENDURANCE HAPPINESS HARMONY
 INTEGRITY MILDNESS PERSISTENCE
 RESTRAINT RIGHTEOUSNESS SERENITY
 TENDERNESS THOUGHTFULNESS
 TRUSTWORTHINESS WORSHIP

BONUSBOX: Look at the list of the “Fruit of the Spirit” and see if you can find the one which is missing from the baskets. Then write it on the back of your paper and along with two synonyms.

Answer Key

The Fruit of The Spirit

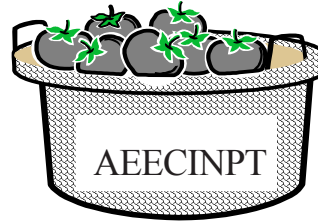
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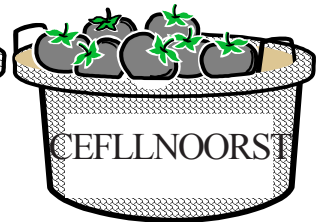
LOVE
ADORE
WORSHIP



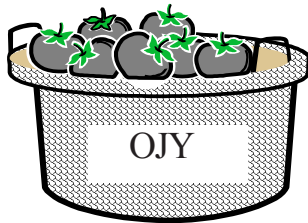
FAITHFULNESS
TRUSTWORTHINESS
DEPENDABLE



PATIENCE
ENDURANCE
PERSISTENCE



SELF-CONTROL
DISCIPLINE
RESTRAINT



JOY
DELIGHT
HAPPINESS



KINDNESS
COMPASSION
THOUGHTFULNESS



GOODNESS
INTEGRITY
RIGHTEOUSNESS



PEACE
HARMONY
SERENITY

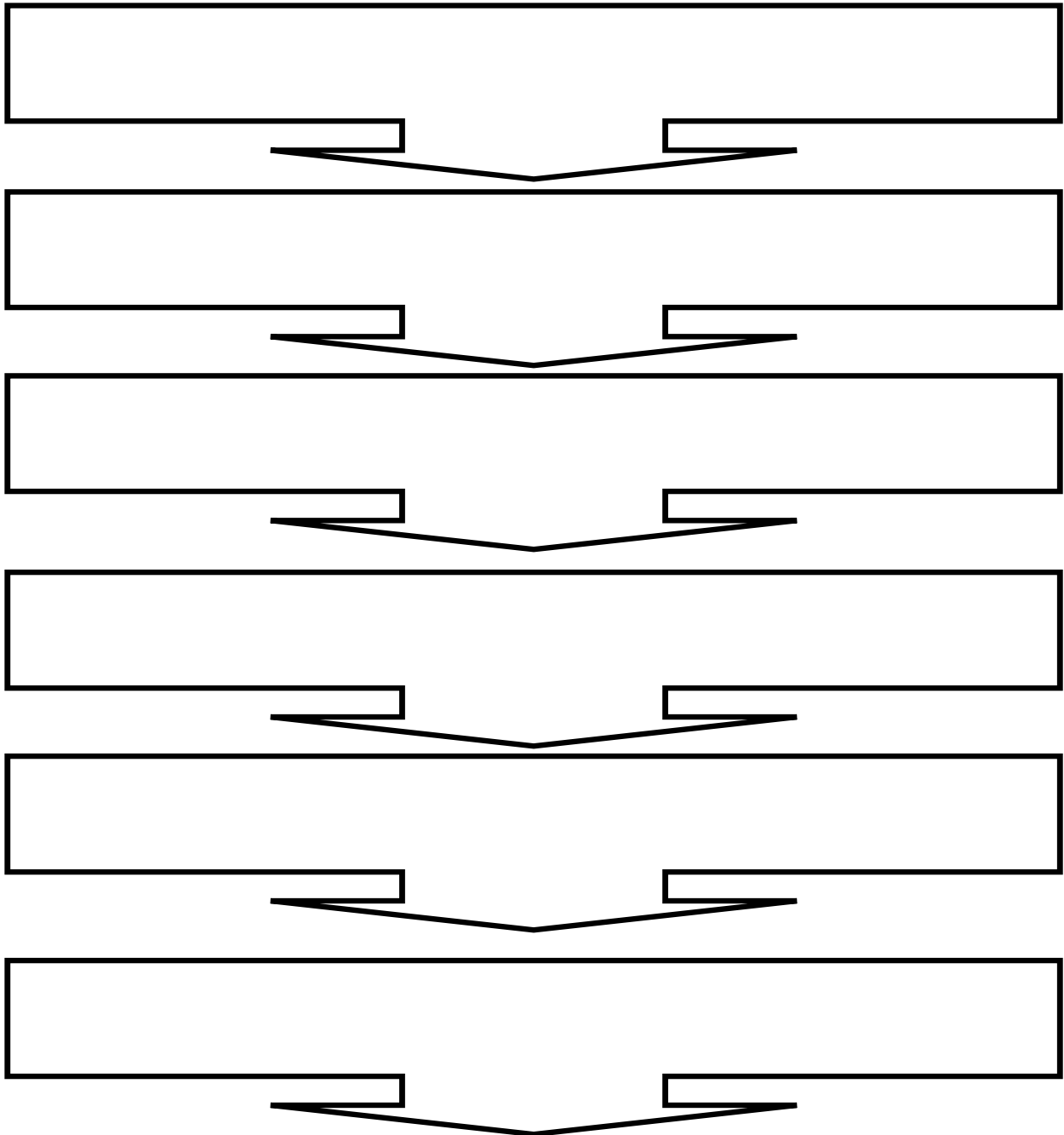
ADORE COMPASSION DELIGHT DEPENDABLE
DISCIPLINE ENDURANCE HAPPINESS HARMONY
INTEGRITY MILDNESS PERSISTENCE
RESTRAINT RIGHTEOUSNESS SERENITY
TENDERNESS THOUGHTFULNESS
TRUSTWORTHINESS WORSHIP

BONUSBOX: Look at the list of the "Fruit of the Spirit" and see if you can find the one which is missing from the baskets. Then write it on the back of your paper and along with two synonyms.

Name: _____

The Life Cycle of A Tree

Directions: With your partner develop a life cycle for an imaginary tree! Write each stage in one box of the flowchart. Decide on an action for each stage. Practice your mini-drama and perform it for your classmates.



Insects - Creepy Crawlies



Materials: A collection of several ants. If possible give this object lesson outside. Prepare ahead by leaving out some bread crumbs or other food known to attract ants! (Or just let your kids eat their lunches outside!) If you prefer an inside lesson, collect several ants in a small clear container.

Object Lesson – The Diligent Ant

“Go watch the ants, you lazy person. Watch what they do and be wise. Ants have no commander. They have no leader or ruler. But they store up food in the summer. They gather their supplies at harvest.”

Proverbs 6: 6-8

Directions: Have students observe the ants for several minutes. Ask students to describe what they see. Then ask students what they learned about ants from this observation? Introduce worship thought by explaining the Bible tells us there is an important character trait we can learn from the ant. Ask students what they think that trait might be. Share Proverbs 6: 6-8 with students, explaining words as necessary for your age group. Point out that the Bible says the ant is a hard worker. Why is it important to work hard at what we do? Not only does the ant work hard, but he does so with out someone always checking up on him! Talk about how ants are able to do things that are seemingly impossible, like carry an object that is very heavy a long distance. What should we do if we feel like something is too hard for us to do? Share with students that we can get strength to do hard things from Christ. I can do all things through Christ who strengthens me. Phillipians 4:13

When we keep trying and working at something even though it is hard we develop the characteristic of diligence. Ants provide us with an example of this characteristic, that’s why the Proverbs says we would be wise to watch and learn from them!



Materials: Assemble *Bug Journals*, collect small baby food jars or other clear containers to store and view insects. (Have each student bring several from home). If possible provide magnifying glasses or little bug boxes for examination of insects. Large sheet of chart paper for **KWL**.

Preparation: Before going out side start a **KWL** chart. In the first column write what students think they **Know** about insects. In the second column write down things that students **Want to know**. Leave the

KWL		
What I Know	Want to Know	Learned

Exploration: Explain to students they will be going on a hunt for the purpose of collecting insects which will be used for several activities throughout the day. Before students set out to collect, establish the parameters or boundaries in which they are to collect Also emphasize how they should treat the insects which will be released back to their homes at the end of the day.

Send students out in pairs with a container to collect insects. Give students enough time to start a collection of a variety of different bugs. You can circulate



among students helping them think of places to look for bugs; under rocks, tree trunks, and on the backs of leaves to name a few.

Once students have had a chance to collect several insects signal them back to a designated meeting place. Ask students to choose one insect from their collection that they think is interesting. Put that insect in a smaller bug box or jar for closer observation.

Have students use magnifying glasses if bug boxes are not available. If magnifying glasses aren't available much detail can be seen with the naked eye! Once students have chosen an insect refer them to the *Insect Hunt* activity page. In this activity they will make drawings of several insects in the boxes on the page. Instruct students to make their drawing as large as the box. Once students begin drawing circulate asking questions to help them think about the details they need in their drawings.

- How many legs does your insect have?
- Does it have wings?
- What do its eyes look like?
- How about its mouthparts?
- Are the legs all the same length?
- Is its shell shiny?
- Does the insect have hairs on its body?

Don't be too concerned if a student has picked up a creature that isn't an insect. They should be able to tell the difference by the time they have completed the day's activities. Once students have finished their first drawing let them choose another insect from their container. Encourage students to look for similarities and differences.

When students have finished several drawings gather in a circle for a group discussion about what they have learned. Using the **KWL** chart, complete the **what I Learned** column. Based on these findings help students derive the common characteristics of insects. If they are able, have them copy the list of characteristics onto the back of the *Insect Hunt* activity page.





Characteristics Common to all Insects



Discuss the characteristics of insects using insects from student collections as examples.



- Body has three segments or parts
 - Head - mouth, eyes, and brain
 - Thorax - locomotion center containing muscles that move wings and legs
 - Abdomen - heart, digestive organs, breathing organs



- Six jointed legs attached to thorax

- Exoskeleton - tough outer covering

- Two antennae for smell, touch, and sometimes hearing



- Spiracles- holes in the thorax and abdomen to breathe air

- Mouthparts that pierce, suck, sponge or chew

- Wings - many insects have two pair, some one, a few have none



ANTENNA

HEAD



THORAX

WINGS

LEGS



ABDOMEN

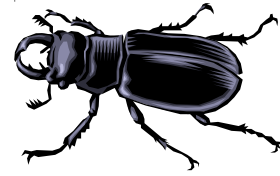




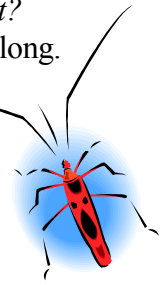
Reading- What Is an Insect?

Directions:

Grades 1 & 2: Have students turn to the *What is an Insect?* activity page. Read the paragraph out loud with students as they follow along. Read it through a second time with students reading out loud. Then read each question allowing time for students to write down their answers.



Grades 3 & 4: Have students turn to the *What is an Insect?* activity page. Read the paragraph out loud with students as they follow along. Ask students to read it a second time silently, then answer the questions that follow.



P.E./Music: Bug Cadence

Directions: Divide students into groups of three to form insects. The first person is the head, the second person is the middle (thorax), and the third person is the stomach (abdomen). The second and third students should place their hands on the shoulders of the person in front of them. Next, have students practice walking in rhythm, slowly chanting “left, right, left, right...” until their steps are all together. Once they are able to move together, have them try marching to the “Bug Cadence”. Students can take turns being leader. **Extension:** Have students make up their own “Bug Cadence.”



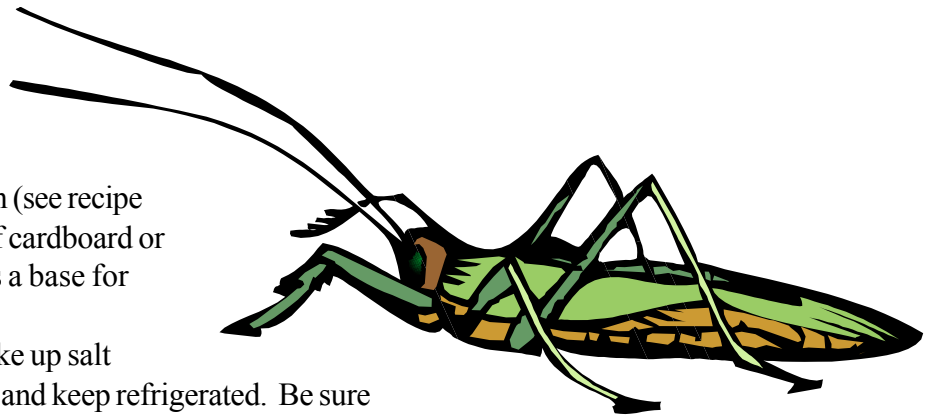
Bug Cadence

Left, Right, Left, Right
Bugs can crawl and bugs can fly,
On the ground and in the sky.
Three legs left and three legs right
Watch out for the ones that bite
Fun to catch and fun to free
Made by God for all to see.

Art - Model Insects

Materials: Salt dough (see recipe below), small pieces of cardboard or pressedboard to use as a base for models.

Preparations: Make up salt dough the night before and keep refrigerated. Be sure to have extra flour on hand in case dough becomes tacky. This activity can be completed outside. If you prefer to work inside, have students collect the natural materials they will need to for the project before they begin. * Note* Also printed below is a



recipe for a soda dough which requires a little more work but provides a softer, shinier look when dried.

Recipe: Salt Dough

1 cup Flour
1 cup Salt
Water

Mix flour and salt together. Gradually stir in small amounts of cool water until a stiff dough is formed. Knead dough until smooth. Dough can be kept in the refrigerator for several weeks. Add more flour if dough becomes tacky.

Directions: Refer students to the *Insect Body Parts* activity page and go over basic insect body parts. The second half of the activity page can be completed once students have finished their insect models. Give each student a piece of cardboard to use as a base for the insect model. Using the salt dough students will fashion the basic insect body segments Head, Thorax,

and Abdomen. Next have students use natural materials to detail the other body parts and to give the insect its own unique look. Circulate among students encouraging them to think about the common characteristics of insects: antenna, six legs, specialized mouth parts, and wings. As students finish they can complete the bottom half of the *Insect Body Parts* activity page. Once insects sit for several days they should develop a nice exoskeleton!

Recipe: Soda Clay

1 cup baking soda
1/2 cup cornstarch
3/4 cup water

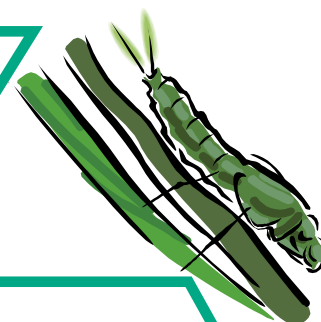
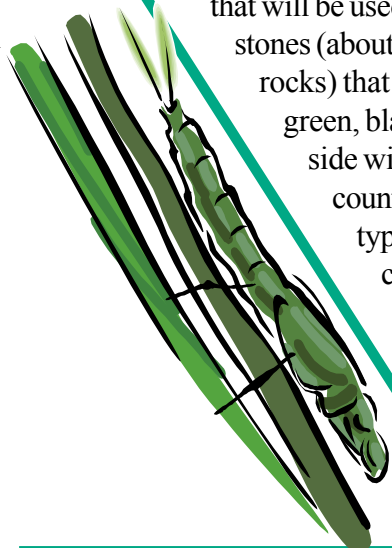
Food coloring (optional)

In a saucepan, stir together the baking soda and cornstarch. Add the water, mixing well. Cook the mixture over low heat stirring occasionally, until it resembles mashed potatoes, about 7 to 10 minutes. You will need to stir it almost constantly the last few minutes as it thickens. Remove the pan from the heat and set it aside. When the dough has cooled, turn it out onto a floured board. Knead the dough with your hands adding more cornstarch as needed, to create a workable clay. For tinted clay, knead in a few drops of food coloring. Allow creations to air-dry overnight. Refrigerate any leftover dough in a ziplock bag for up to 3 days.



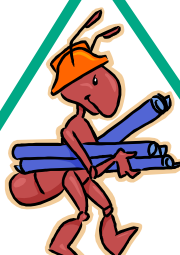
Math – Hide and Seek

Materials: You will need a set of small different colored objects (a maximum of five per color) that will be used to represent insects. Small stones (about the size of landscaping rocks) that have been painted red, green, black, and yellow on one side will work. Colored counting tiles or other types of colored counters would also work.

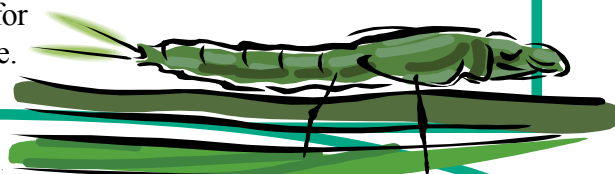


Preparation:

Divide students into groups. Designate a plot of land for each group and in each area hide a collection of “insects.” Make sure that there are at least four different colors, some bright and some dark. Hide the same number of bugs for each group.



Directions: Explain to students that you have hidden a collection of insects for each group in a specific area. Show students several examples of these “insects” so they will know what to look for. It will be their job to seek and find as many of these hidden insects as they can during the given time period. The time given should depend on the size of the area in which the “insects” have been hidden as well as the age and number of students in the groups. If you have a small area, give only a minute or two. If insects are spread out in a larger area give a longer amount of time. Once time has been called have students bring the “insects” they have collected to a predetermined meeting location. Have each group count up the total number of insects found. Ask students to look at their collections. Which color insects did they find the most of? The least? Which ones were easier to find? Why? Which color insects were hardest to find? Why? Explain to students that often times insects are difficult to spot because they blend into their environment. Some insects will look like a stick or branch, some like a leaf or blade of grass, and others like a small rock or piece of dirt. This is what is known as camouflage. Discuss why this would be useful for insects? Complete *Hide and Seek* activity page.

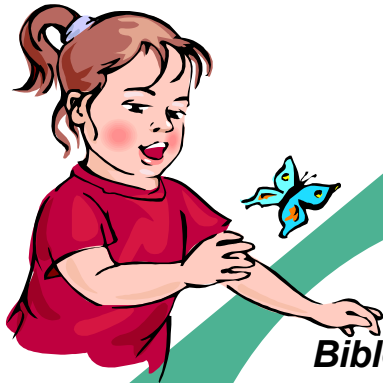
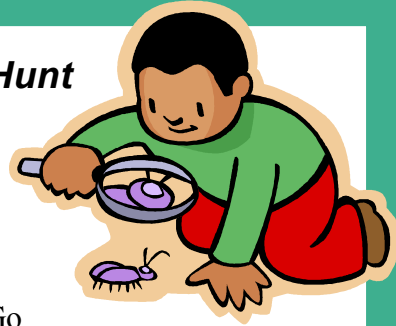


Extension: When students have finished the activity page. Give them a chance to play a round of Insect Hide and Seek. Have one student hide the insect collection in a designated area for the other members of the team to find.

Multi-grade Activity -Scavenger Hunt

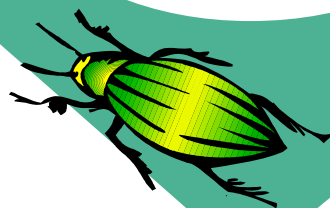
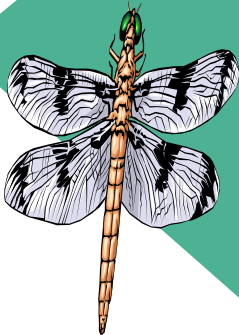
Materials: One copy of the *Scavenger Hunt* activity page for each group, pencils and a portable writing surface.

Directions: Divide students into groups of two or three. Pair older students with younger students. Go over scavenger hunt instruction sheet and make sure all students are clear about where they may go on their hunt. Establish a regrouping signal (two whistle blows, or bell ringing, etc...).



Bible - Release Ceremony

Directions: At the end of the day take a few moments to return the insects you have collected back to their home. Talk with students about how God established man to be caretakers of His creation (See Gen. 1: 28). Help students think about ways in which they can be good stewards of God's earth and its creatures. Then close out the day by releasing all the insect at once and offering a prayer of thankfulness to God for His creation.



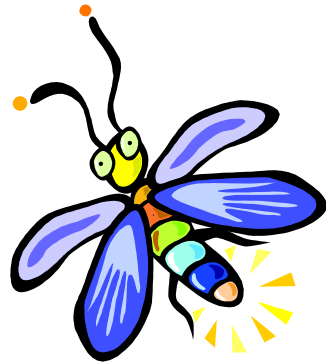


Other activities that will help your study of insects take off!

- Tape record insects sounds around your school or home
- Identify the most common insects found in your town/state
- Take a field trip to a nature center or Natural History Museum
- Invite an entomologist to your classroom
- Create miniature insect habitats in appropriate containers for insect observation
- Write haiku poems about insects
- Make insect-related food: ants on a log, bug juice, and ladybug cupcakes



Learning Center



Grades 1 & 2 - Life Cycle of a Butterfly

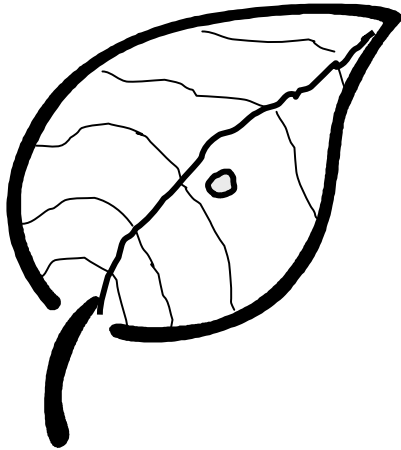
Materials needed: One copy of Eric Carle's *The Very Hungry Caterpillar*; Copies of the Life Cycle of A Butterfly activity page, 12 X 18 construction paper cut in half lengthwise, scissors, and glue.

Instructions: Place the above materials in the center. Explain to students that they should first read the book, then complete the activity page. Go over activity page instructions with students. Demonstrate how to fold the book in an accordion style and provide a sample at the center. Also instruct students to put a title on the front cover of their book and write their name as the author.

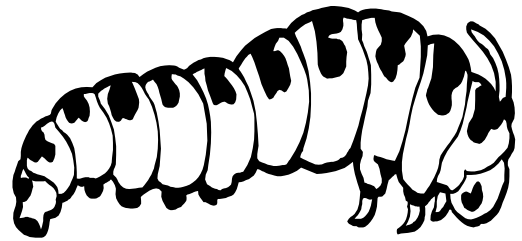
Grades 1 & 2 - Ladybug Symmetry

Materials needed: Copies of the Ladybug Symmetry activity page. Explain to students that ladybugs have the same number and arrangement of spots on both sides of their exoskeleton. This concept is known as symmetry. To complete the activity page, students should make each ladybug symmetrical by drawing in matching spots on the right side of each ladybug.

1



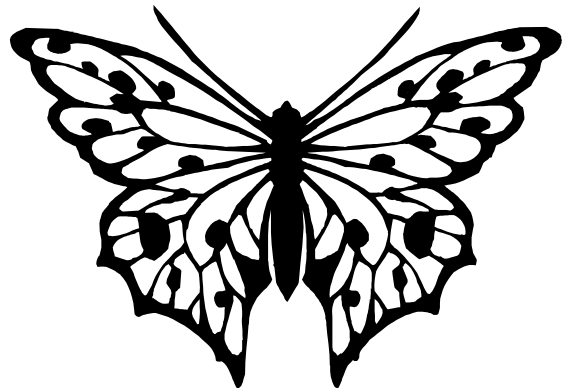
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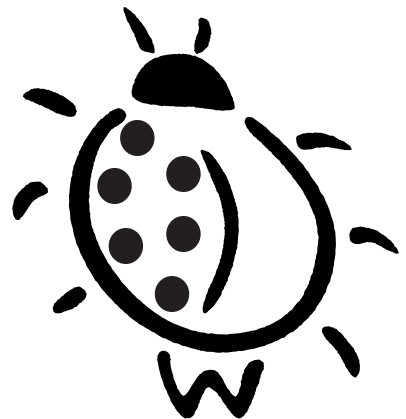
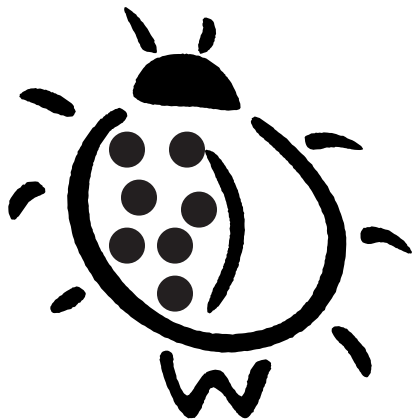
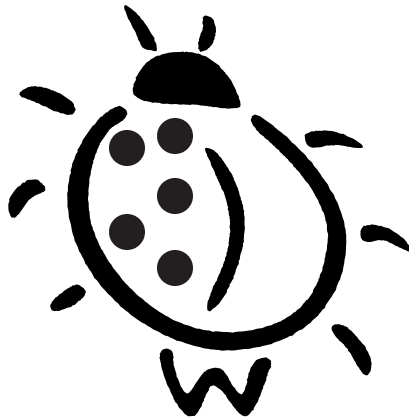
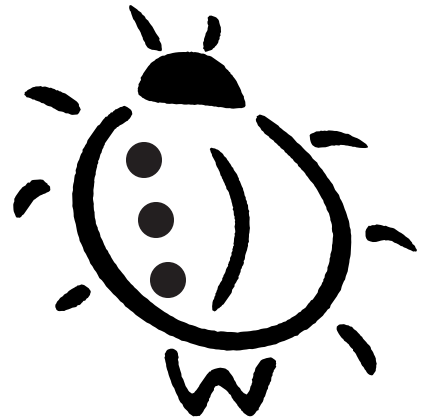


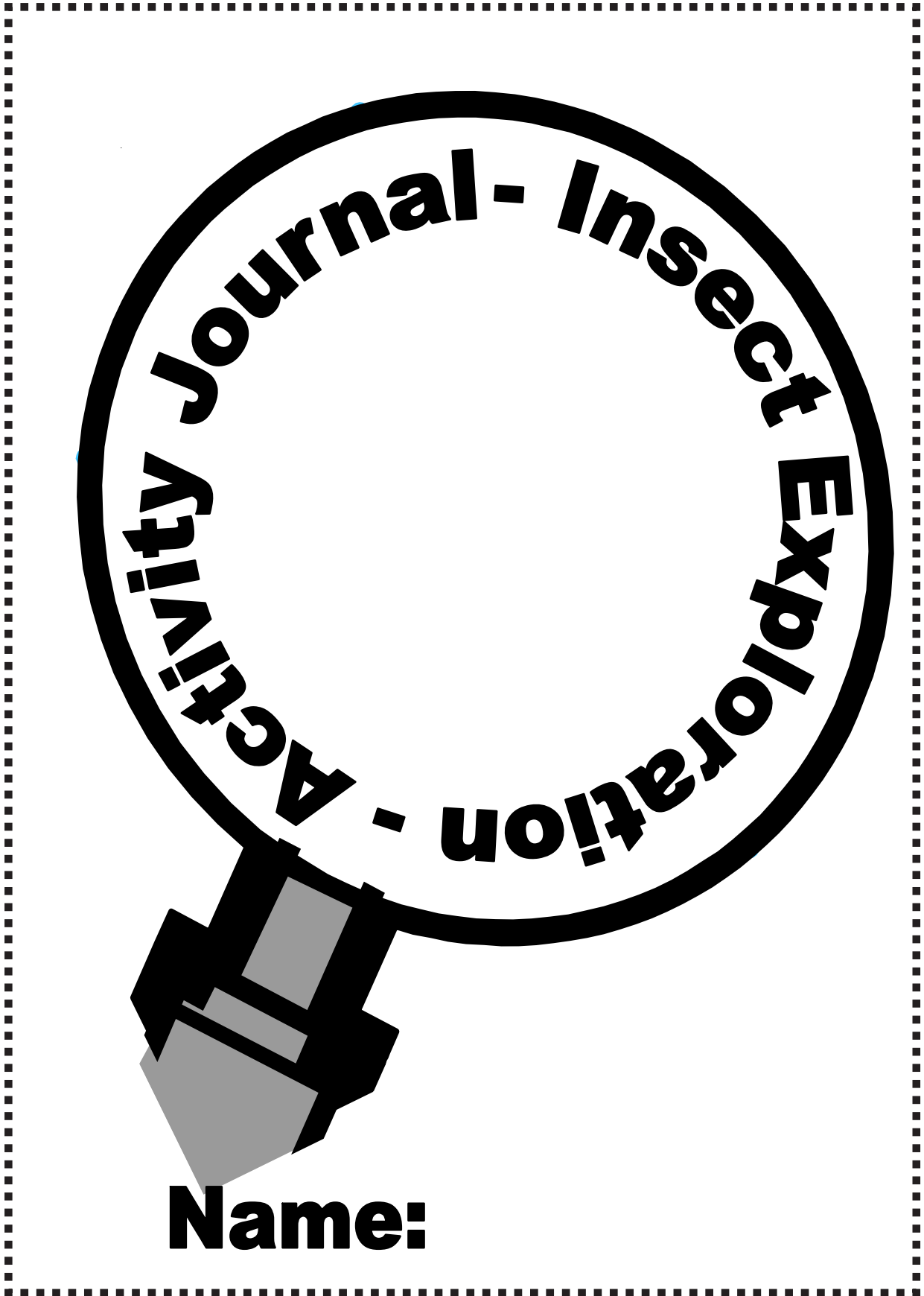
Lifecycle of a Butterfly

Directions: Color the pictures. Cut along the dotted lines. Glue pictures in order on a piece of colored paper. Fold to make a book.

Ladybug Symmetry

Directions: Draw in circles on the other side of the ladybug so that both sides of the ladybug match.







Directions

Look at your bug.
Draw your bug in one of
the boxes.
Make your drawing as big
as the box.

Drawing #1

Drawing #2

Drawing #3



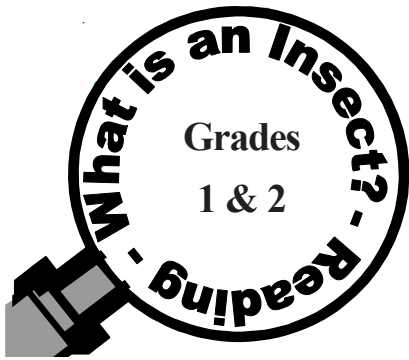
Directions: Carefully examine your insect. Then make a detailed drawing of the insect in one of the boxes. Make sure your drawing is as big as the box.

Drawing #1

Drawing #2

Drawing #3

Drawing #4



Insects

Insects have six legs.
An insect's body has three parts.
Most insects have wings.
Ladybugs are beautiful insects.

1. How many legs does an insect have?

2. How many body parts does an insect have?

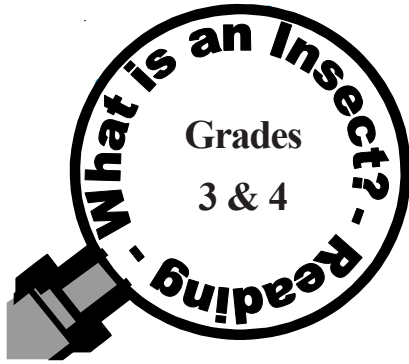
3. Do most insects have wings ?

4. Is a ladybug an insect?

5. How many legs does a ladybug have?

Bonus Box: Design an insect. Draw it on the back of this paper.

Insects



There are over 900,000 different kinds of insects. All insects have the same basic body structure. An insect's body is made up of three main parts: head, thorax and abdomen. The head has the eyes, one pair of antennae, and mouthparts. The middle section, or thorax, has three pairs of legs. Most insects have two pairs of wings, some have one pair, and a few have none. The abdomen contains the heart, digestive organs, and reproductive organs. Breathing is done through holes in the abdomen. An insect's external skeleton is very important--it acts like a suit of armor.

1. What do all the different kinds of insects have in common?

2. Name the three basic body parts of insects?

3. On what part of an insect's body are the eyes, antennae, and mouthparts located?

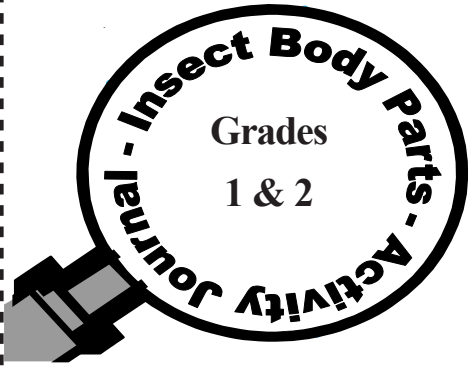
4. How many legs does an insect have?

5. Do all insects have wings?

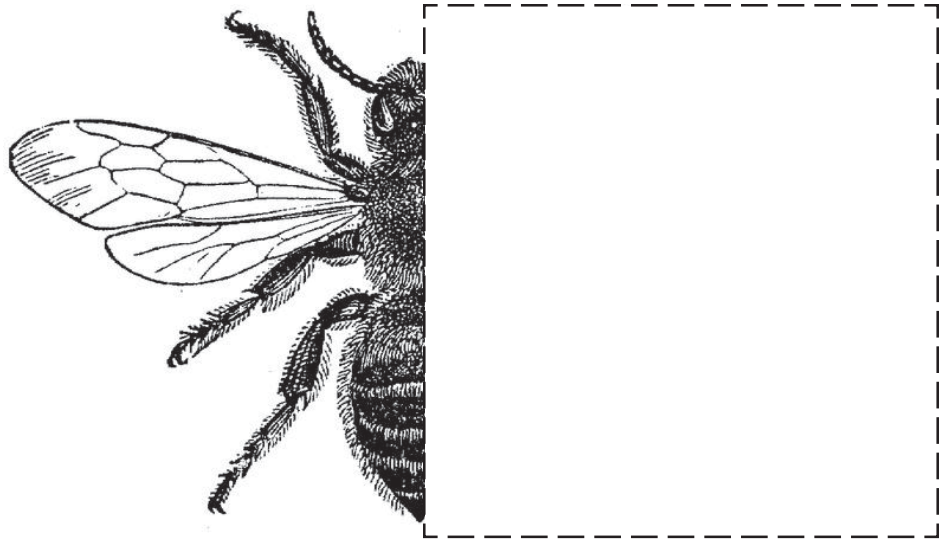
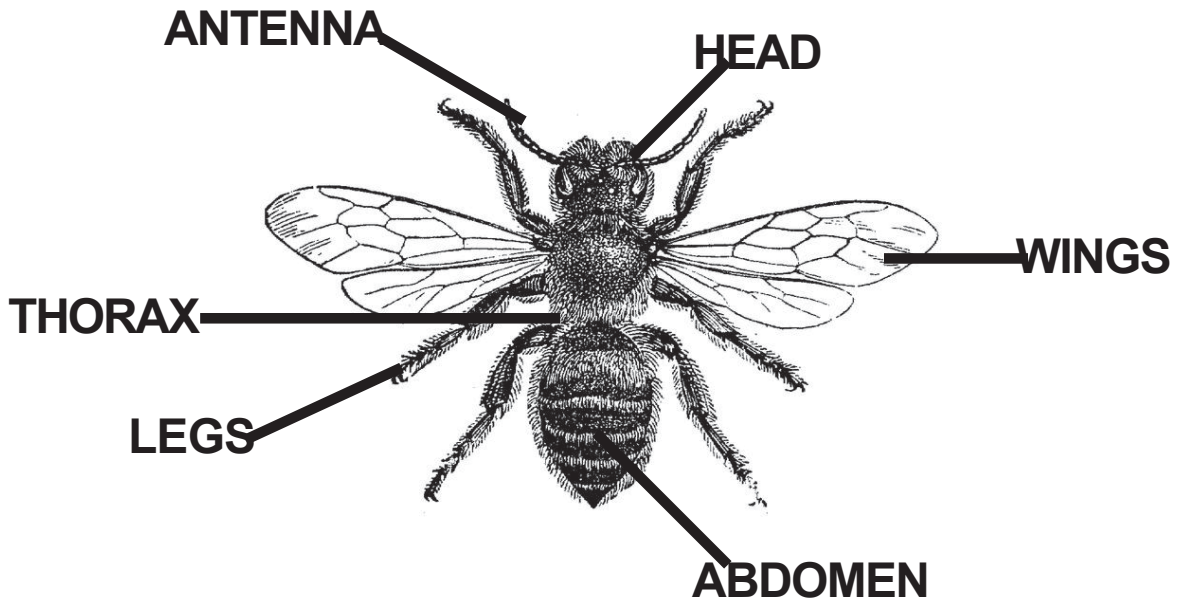
6. How does an insect breathe?

7. Why is an insect's external skeleton important?

Bonus Box: Design an insect. Draw it on the back of this paper.

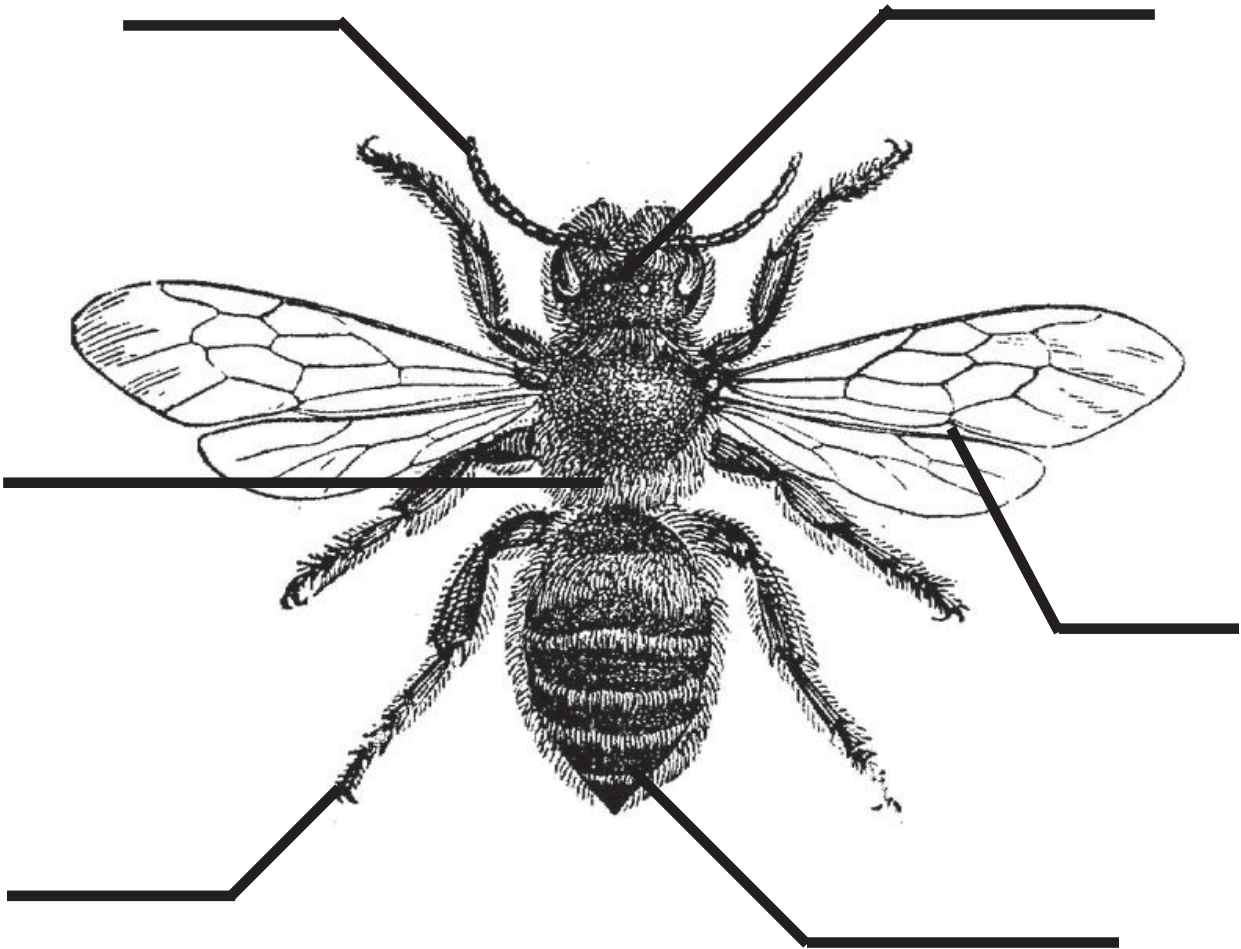


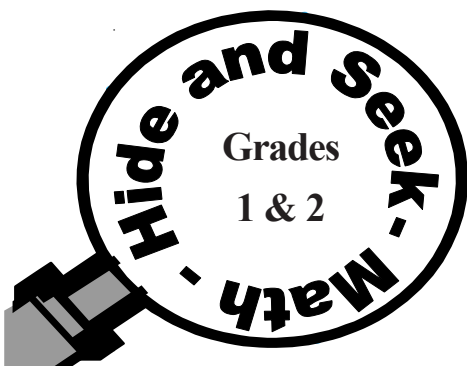
Directions: With the help of your teacher, study the picture of the insect. Then draw in the missing half of the honeybee picture.





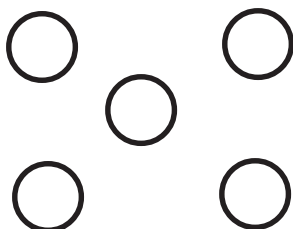
Directions: Using the diagram of the honeybee, label the major body parts of an insect.



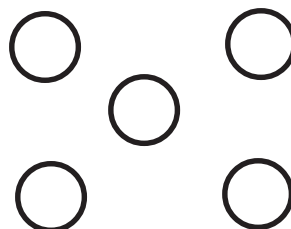


Directions: Put all the red bugs in one pile. Put all the green bugs in one pile. Put all the yellow bugs in one pile. Put all the black bugs in one pile. Count how many of each kind of bug you have. Color in the number of circles to show how many of each bug you have.

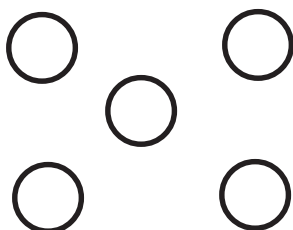
Color the circles red to show how many red bugs you have.



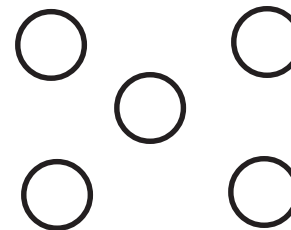
Color the circles yellow to show how many yellow bugs you have.



Color the circles green to show how many green bugs you have.



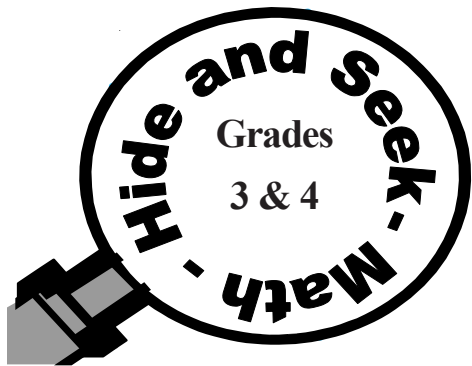
Color the circles black to show how many black bugs you have.



I have _____ red bugs.
I have _____ yellow bugs.
I have _____ green bugs.
I have _____ black bugs.
I have _____ bugs all together

Bonus Box: Use your "bugs" to create number sentence. Write them on the back of this paper.

Example.
 $3 \text{ red bugs} + 4 \text{ green bugs} = 7 \text{ bugs}$.



Matthew's group found a total of 14 insects. Four insects were red. Five were yellow. Three were green and two were black. They used fractions to show how many of each color they had found.

$\frac{4}{14}$ red insects $\frac{5}{14}$ yellow insects
14 insects total 14 insects total

Directions: Answer the questions below using your group's "insect" collection.

1. What is the total number of insects that your group found? _____
2. What fraction of the insects were red? _____
3. What fraction of the insects were yellow? _____
4. What fraction of the insects were green? _____
5. What fraction of the insects were black? _____
6. What fraction of the insects were red and yellow? _____
7. What fraction of the insects were green and black? _____

Bonus Box: Use your "Insects" to create number sentences with fractions.

Example: $\frac{4}{14} + \frac{3}{14} = \frac{7}{14}$ bugs

Look for a flying insect? Follow it. How many times does it land? What does it land on?

Sit quietly for one minute and listen for insect sounds. Describe three different insect sounds that you heard.

Find a flower with at least two different kinds of insects on it.

Look at the earth underneath a patch of grass a count how many insects you find there.

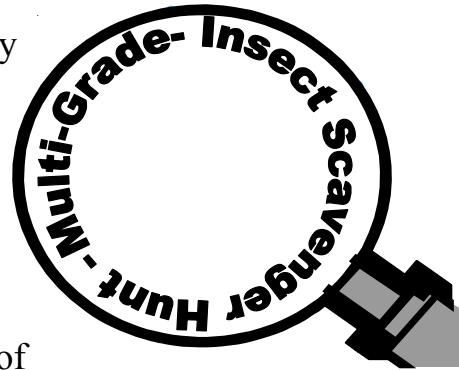
Find an ant that is carrying something? What is it? Where is it going?

Find a stone or a log and roll it over and see what is underneath it? Replace it exactly how you found it?

Catch three different insects. See if you can count how many wings they have.

Look for a bumblebee or honey bee. Do you notice any pollen collected on its legs?

Draw a picture of the insect you came across the most often.





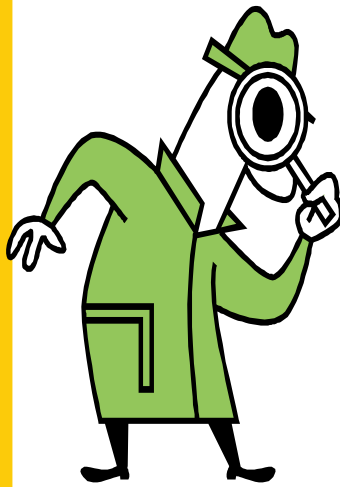
Object Lesson - Designed to be Different

Text- “I praise you because you made me in an amazing and wonderful way. What you have done is wonderful.” Psalm 139:14
ICB

Materials- Puddles (natural or man-made)

Lesson - Take students out to look at puddles formed by rain or that you have created. Challenge students to see if they can find two puddles that are similar. Once a child thinks they have found two such puddles take the group over to investigate each one. Ask the students to tell you what they notice about the two puddles. Once you have spent a few minutes comparing the puddles, ask students if they think these two puddles are exactly alike. More than likely they will notice that even though these puddles share some common characteristics, each one also has its own unique characteristics. Point out although some puddles at first glance may seem to be very similar, upon further investigation there were many interesting differences as well. Ask students if they think this same principle would also hold true for other objects in nature, i.e. rocks, trees, flowers, etc. Discuss what this tells us about the nature of God the Creator. Explain to students these same concepts apply to the people God created. Read Psalm 139:14. Talk about how as humans we share many common characteristics and traits, but yet God has designed us each to be different, with our own special and distinguishing characteristics and traits. Discuss how this should affect our attitudes and actions towards each other. Then pair students up to complete the activity page. This page will let students get to know the things that are special about each one of them. Before closing, have students share what some of the special things are that they learned about each other.





Nature Exploration - Puddle Profile

Materials: yarn, rulers, yardsticks, Puddle Profile activity page, volunteers- either adults or team up with an older class to help younger students.

Directions: Sharpen your students' attention to detail with the following activity designed to assist students in exploring puddles. Divide students into pairs. Assign, or allow each pair to choose, a puddle they would like to explore during this activity. Explain that students will be developing a detailed profile of their puddle. Have students look at the Puddle Profile activity page and go over each of the items

with them.

- Name- Come up with a creative name to describe the puddle.
- Length- Use ruler or yardstick to measure the distance of the longest side of the puddle.
- Width- Use ruler or yardstick to measure the distance of the shortest side of the puddle.
- Circumference - Use yarn or string to measure the distance around the puddle. Then measure yarn against a yardstick or ruler.
- Depth- Use a stick or ruler to measure the depth of water in the puddle in several locations -edges, middle.
- BasicShapes- Describe the basic shape of the puddle.
- Water Color - Describe the color of puddle water.
- Distinguishing Features - Write down any features that would help to distinguish their puddle from other puddles.

WANTED!



Puddle Profile

Name: Muddy Mud Puddle

Length: 3 feet 6 inches

Width: 2 feet 2 inches

Circumference: 7 feet

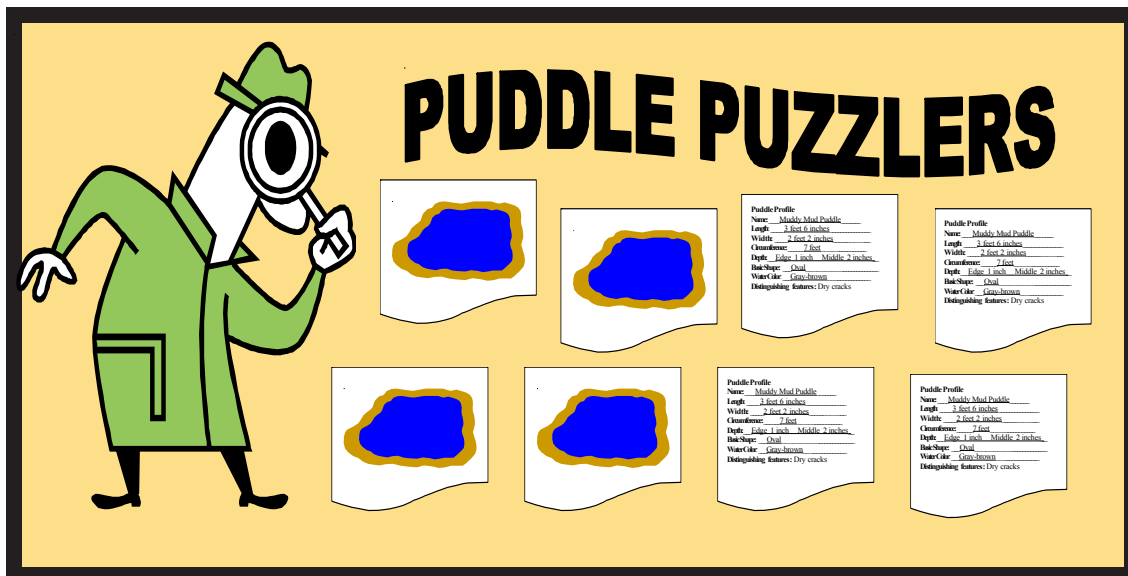
Depth: Edge 1 inch Middle 2 inches

Basic Shape: Oval

Water Color: Gray-brown

Distinguishing features : Top end of the oval puddle juts out slightly. Two medium size rocks stick up out of center, edges slope down gently and are partially dried. Several small insects are swimming on surface. Bottom of puddle has three long cracks running lengthwise.

For multi-age classrooms have older students work together with younger students to complete the *Puddle Profile* activity page.



Bulletin Board - Puddle Puzzlers

Materials: Copy of Detective M. Puddle. Student completed *Puddle Puzzler* activity page. Letters for Title.

Directions: Enlarge a copy of Detective M. Puddle. Color and place him on board. Once students have completed the *Puddle Puzzler* activity page have them cut the page in half along the dotted line. Arrange the top half of the pages on one half of the board and the bottom half of the pages on the other half. Have students see if they can match the profile with the picture.



Detective M. Puddle needs to identify each puddle in order to solve his case. This case has him puzzled so help track down these slippery suspects by matching the *Puddle Profiles* to their pictures.

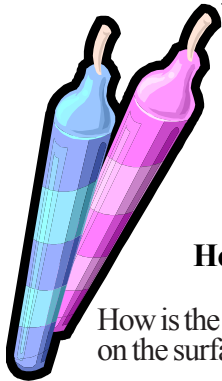


Science - Staying on Top

Materials: paper clips, plastic forks, magnifying glass, candle (optional)

Directions: This simple activity will help your students understand the concept of surface tension. Give students a plastic fork and several paper clips. Have students try to float the paper clip on the surface of the water, using the fork to help place it gently. Once the students have floated the paper clip successfully, use the magnifying glass to look at the water the paper clip is floating on. Ask students what the surface of the water looks like? Ask them to think about why the paper clip can float on the water.

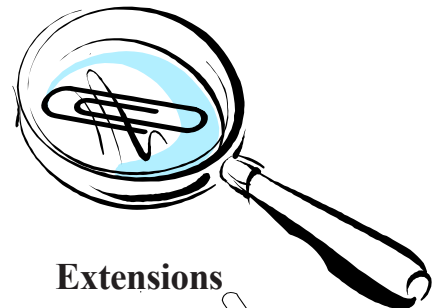
*Note if students have difficulty getting the paper clip to float rub the paper clip over a wax candle.



How It Works

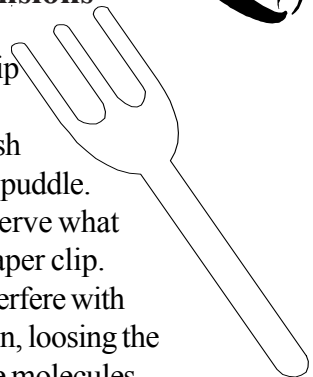
How is the paper clip able to float on the surface of the water?

The paper clip floats because of the surface tension of the water. The water molecules at the surface have a strong attraction to each other and form a flexible skin. When you place the paperclip on the surface without breaking through the "skin" it will float. When students look carefully at the surface of the water around the paper clip it will seem to be indented. The water looks as if it is stretching.



Extensions

Have students drip several drops of biodegradable dish detergent in their puddle. Ask them to observe what happens to the paper clip. The soap will interfere with the surface tension, loosening the bond between the molecules. The water will no longer be able to hold the paper clip on the surface.



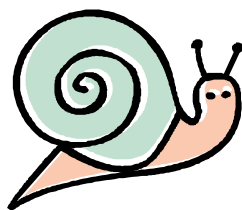


Science - Will It Sink or Will it Float?

Materials: A variety of small natural objects (leaf, pebble, seed, twig, etc.) that can be tested for bouyancy. A copy of *Sink or Float* activity page.

Directions: Here is an activity for exploring the concept of bouyancy that will provide students with plenty of opportunity for splash! Have students collect a variety of small natural objects to perform bouyancy tests on. Explain to students that they will be testing the objects they have collected for bouyancy - to see if they will float or sink. Students will record the results of these tests on the *Sink or Float* activity page. They will need to sketch a picture and write the name of the object. Before testing, they will guess whether it will float or sink. Next, they will test their guess by placing the object on the water in the puddle. Finally, they will record what happens and record the results of the test.

How it Works: Whether or not an object floats depends on the balance between the bouyant force of the water and the weight of the object. If the force of the water pushing up is greater than the weight of the object then the object will float. If the weight of the object is greater than the water's bouyant force then the object will sink.





Art - Float Your Boat

Materials: Squares of aluminum foil, squares of paper, straws, hole punch, tape, pennies.

Directions: Have students shape a boat using a square of aluminum foil. Students should test several designs in order to get the best float possible. Older students can experiment by adding a sail attached to a straw. Once students have a boat design which they feel floats well, have them test the design by seeing how many pennies it will hold before it begins to sink.

Bible Wind and Wave Obey

Text: Call upon Me in the day of trouble; I will deliver you, and you shall glorify Me. Psalm 50:15 ICB

Ask students to recount the story of Jesus calming the storm. Read Mark 4:35-41. Talk with students about how Jesus is always there for us in the midst of difficult situations in our lives. Have students suggest some of these types of situations that could be considered "storms" in our lives.

Finish discussion by reading Isaiah 43:1-3 ICB.

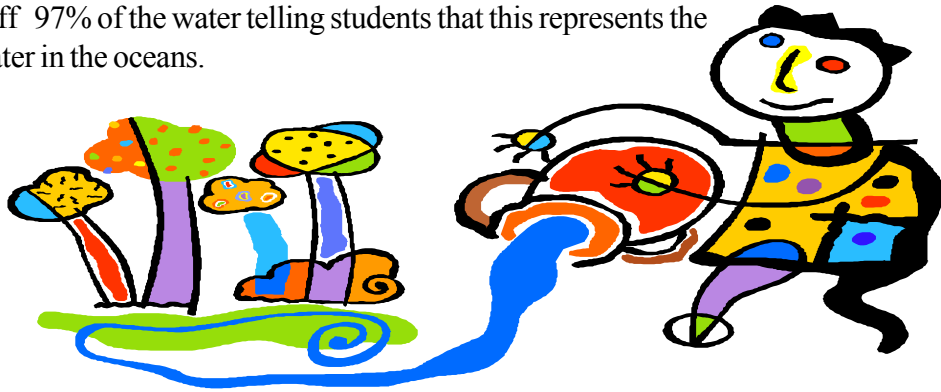


Now this is what the Lord says. He created you, people of Jacob. He formed you, people of Israel. He says, "Don't be afraid, because I have saved you. I have called you by name, and you are mine. When you pass through the waters, I will be with you, you will not drown. When you pass through fire, you will not be burned. The flames will not hurt you. This is because I, the Lord, am your God. I, the Holy One of Israel, am your Savior. Isaiah 43:1-3 ICB

Social Studies – All The Water in the World

Materials: 2 gallons of water. Clear glass measuring cup filled with water.
Saltine crackers

For this demonstration pour water onto the ground in an area that will likely create a puddle. Explain to students that this gallon of water represents all the water on earth. Pour off 97% of the water telling students that this represents the salt water in the oceans.

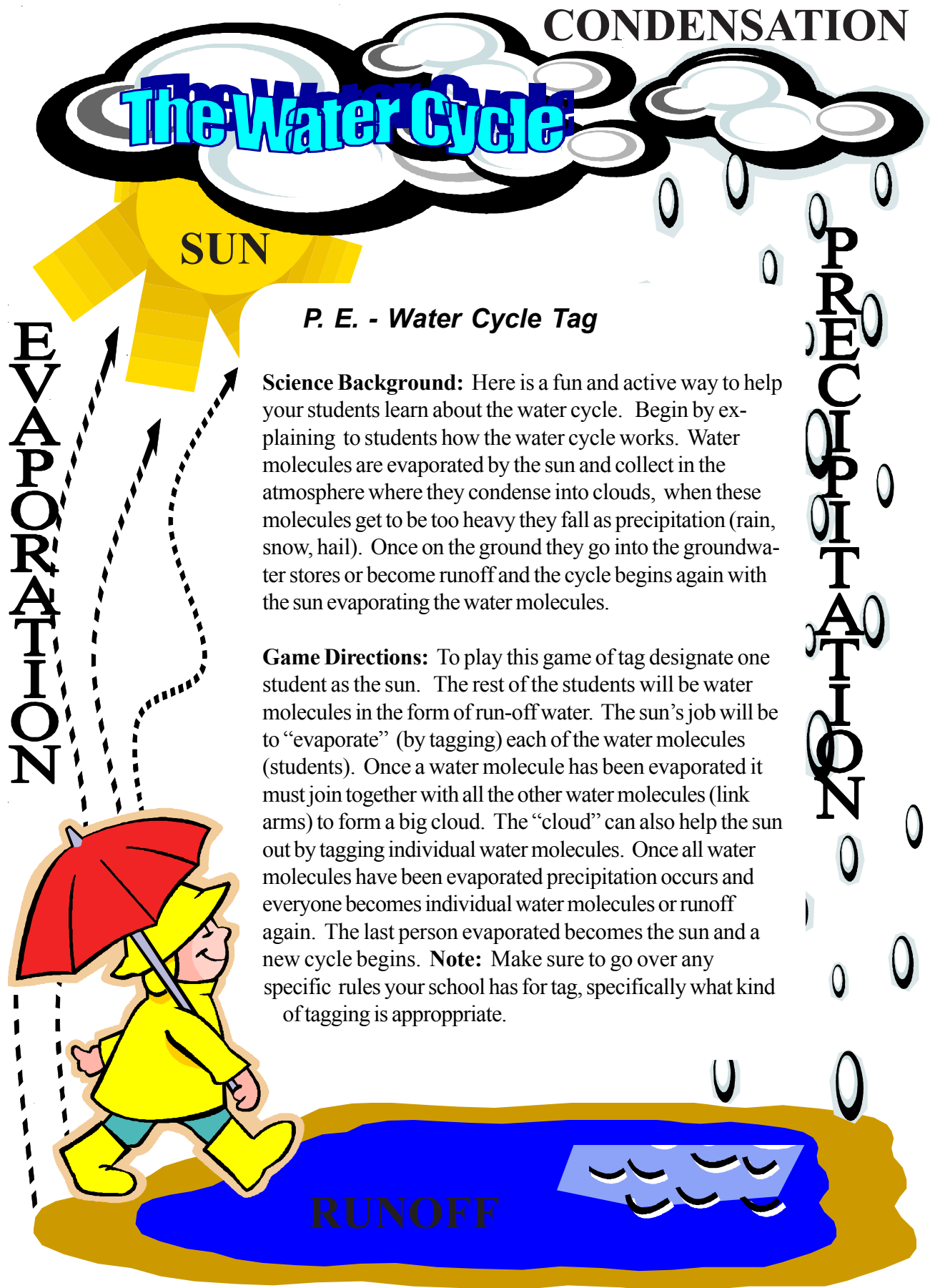


Hold up container so students can clearly see the remaining water. Tell students that this remaining 3% represents earth's freshwater supply. Pour out 2% more announcing that this water is unavailable because it is in frozen ice caps or glaciers. Pour half of the remaining water into a bowl. Explain that this is the amount of water that is groundwater found underneath the earth's surface. Divide up the remaining water into little paper cups according to the number of students you have.

Explain that available water and access to the earth's freshwater supply varies from place to place on our planet. On some land masses people may have as little as one gallon of water to use per day, while in other places they may have more than 150 gallons. Divide students up into six groups. Assign each group one of the following continents or countries. Illustrate this point by dividing a gallon of water up into appropriately sized containers, according to the following measurements

Africa	5 oz
North and Central America	23 oz
South America	5 oz
Asia	55 oz
Europe	28 oz
Former Soviet Union	12 oz

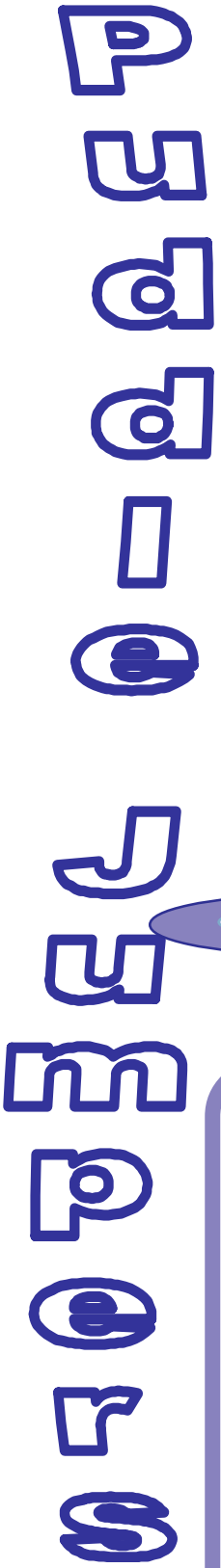




P. E. - Water Cycle Tag

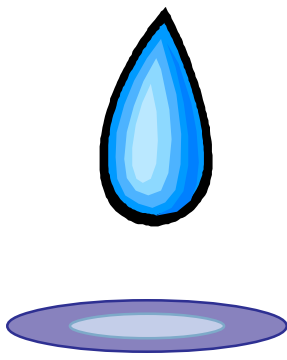
Science Background: Here is a fun and active way to help your students learn about the water cycle. Begin by explaining to students how the water cycle works. Water molecules are evaporated by the sun and collect in the atmosphere where they condense into clouds, when these molecules get to be too heavy they fall as precipitation (rain, snow, hail). Once on the ground they go into the groundwater stores or become runoff and the cycle begins again with the sun evaporating the water molecules.

Game Directions: To play this game of tag designate one student as the sun. The rest of the students will be water molecules in the form of run-off water. The sun's job will be to "evaporate" (by tagging) each of the water molecules (students). Once a water molecule has been evaporated it must join together with all the other water molecules (link arms) to form a big cloud. The "cloud" can also help the sun out by tagging individual water molecules. Once all water molecules have been evaporated precipitation occurs and everyone becomes individual water molecules or runoff again. The last person evaporated becomes the sun and a new cycle begins. **Note:** Make sure to go over any specific rules your school has for tag, specifically what kind of tagging is appropriate.



Puddle Evaporation

Use an eye dropper to make a small puddle of water on a sidewalk or tarred surface. Use chalk to draw an outline around this tiny puddle. Then keep track of how much time it takes for the puddle to evaporate.



Properties of Water

Set up exploration stations where students can discover the properties of water.

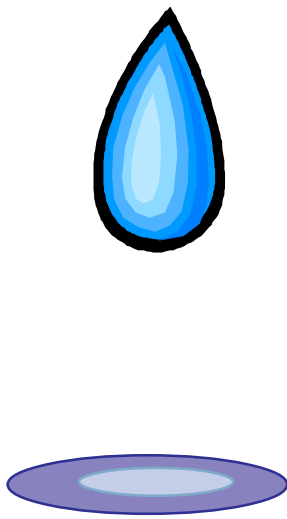
- solid, liquid, gas - water is the only liquid that can exist naturally in three states- have students place an ice cube in a cup and watch the transformation.
- solutions and suspensions - provide a variety of substances that students can stir into water. Have them observe how it dissolves.



Puddle Poetry

Have students write a four line poem using the formula below. Have students choose a word for each category. Once they have created their poem, have them write it on the *Water Drop Poem* activity page.

<u>Formula</u>	<u>Example</u>
see	waves
taste/ hear	splash
feel	wet
uses for	swimming



Bible - Watery Charades

Directions: Students can have fun reviewing Bible stories which all involve water. Make a copy of the charade cards below. Cut the cards apart and put in a hat. Have students take turns drawing a card and acting out the scene for their classmates to guess. Give students a chance to look up the accompanying Bible text if they are unfamiliar with the story.

Noah and the Flood Genesis 6-7	Baby Moses in Floating Basket Exodus 2:1-3
Gideon and the Fleece Judges 6:36-40	Moses Strikes Rock for Water Numbers 20: 8-12
An Axehead Floats 1 Kings 6:1-7	Jesus baptized by John the Baptist Matthew 3: 16-17
Peter Walks on the Water Matthew 14: 28- 32	Jesus Turns Water to Wine John 2: 7--9
The Woman at the Well John 4:1-15	Jesus Heals Man at Pool John 5:1-9
Red Sea Parts for Israelites Exodus 14:21-22	Naaman Washes in River 2 Kings 5:10-14

WANTED

Puddle Profile

Name: _____

Length: _____

Width: _____

Circumference: _____

Depth: _____

Basic Shape: _____

Water Color: _____

Distinguishing features or marks: _____

Name _____

SINK OR FLOAT

What happens when you put an object in your puddle? Record your observations and data in the spaces below. Draw and label a picture of the test object. Next write whether you think it will sink or float. Place the object in the puddle and observe for several minutes. Write down what happened during that time. Indicate whether the test results show your object sinks or floats.

OBJECT	GUESS	WHAT I SAW	S	F

Name _____

How Much Water Was Used ?

Matt estimated that his family of five flushed the toilet 20 times a day. How much water was used?

Dawn takes one shower per day. How much water did she use taking showers in the month of January?

Evelyn has four kids who dirty a lot of clothes. She does about 10 loads of laundry every week. About how much water is used?

Mom gives the twin baby girls a bath together every night. How much water is saved in one week by doubling up the babies' bath time?

Anne's family runs the dishwasher twice a day. How much water do they use in a week?

Bonus:
If Anne's family decides to handwash one load of dishes each day, how much water would they save?

Water Use Table

One flush of toilet
5 gallons

One 10 minute shower
60 gallons

One bath
27 gallons

One washing machine load
30 gallons

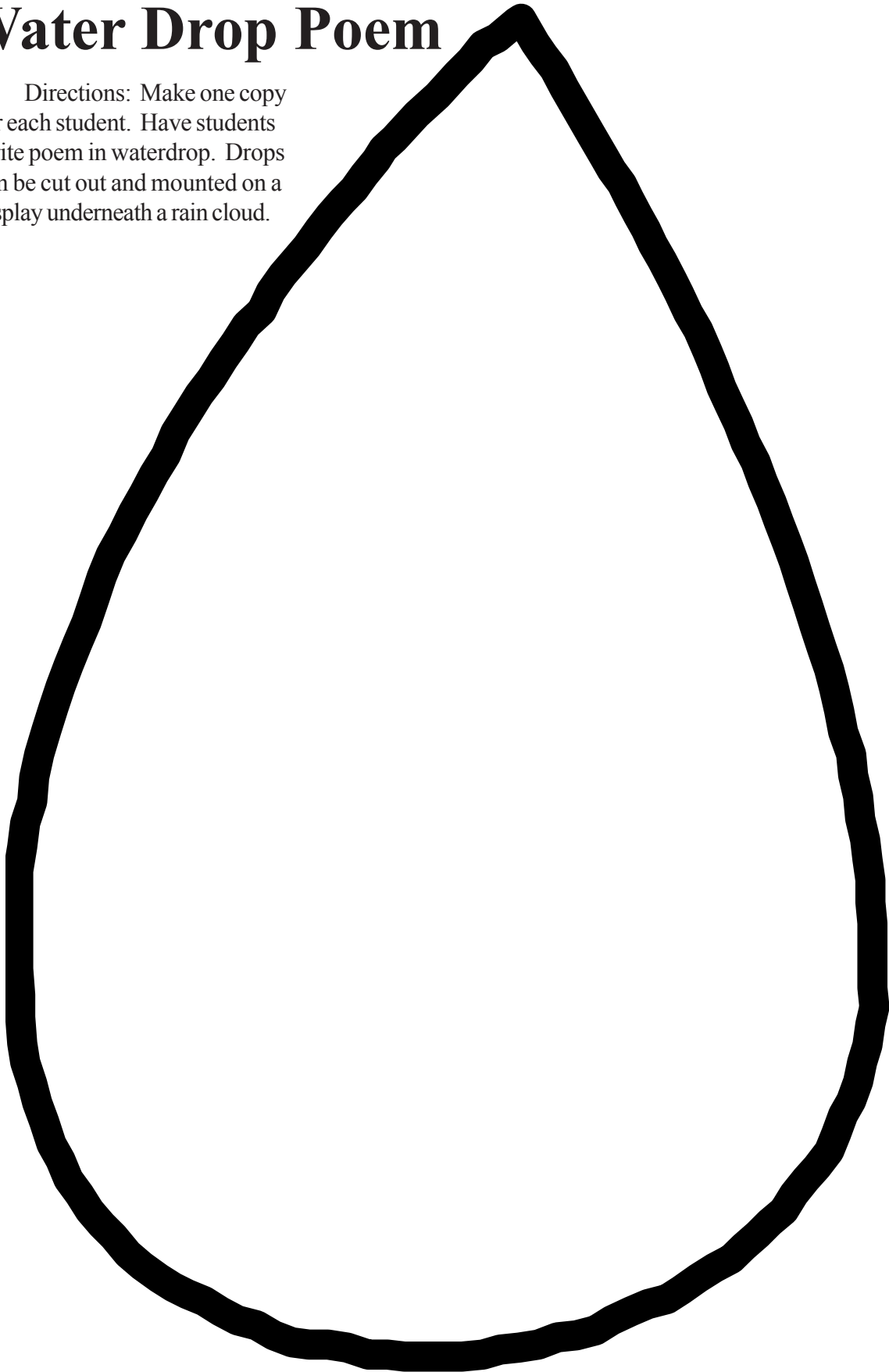
One dishwasher load
10 gallons

One load of handwashed dishes
7 gallons

Answer Key: Matt-100 gal.; Dawn-1,860 gal.; Evelyn-300 gal.; Mom-189 gal.; Anne-140 gal.; Bonus-21 gal.

Water Drop Poem

Directions: Make one copy for each student. Have students write poem in waterdrop. Drops can be cut out and mounted on a display underneath a rain cloud.



Exploring Nature With Children

If you enjoyed these units and are considering further nature explorations with your students, here are some useful instructional strategies to guide you in your explorations. Happy Trails!



The Art of Questioning

It is helpful to think of your role as that of coach as you assist your students in guided discovery. Help them use their senses to collect data, develop ideas and test them through the scientific method, and make their own discoveries. It is important that the emphasis be placed on the process of investigating and working out their ideas, rather than memorizing a specific set of facts.

One important instructional strategy to use during nature explorations is the art of questioning. The description of the following six types of questions have been adapted from *Open-Ended Questioning* by Robin Freedman (1994).

- *Description questions* encourage students to use their senses (e.g., What does it feel like? What does it smell like?)
- *Comparison questions* encourage students to compare and contrast different things (e.g., What is the difference between...? What do you see that is the same between...?)
- *Analysis questions* encourage students to describe what something is and isn't (e.g., Can you tell me about what you found? What didn't you find that you thought you might?)
- *Problem-solving questions* provide opportunities to describe a problem, propose a solution, and convince a group that it is reasonable and feasible (e.g., What if...? What is the problem? How might you solve it? Why do you feel your hypothesis would work?)
- *Fiction questions* ask students to synthesize information in an imaginary context (e.g., If you were.. What would you do?)
- *Evaluation questions* focus on supporting evidence, facts, expert opinion, or research (e.g., How do you know...? What evidence do you have that supports your hypothesis?)

If these strategies are used on a regular basis, students will spend more time on their own investigating, researching, solving problems, and drawing their own conclusions. With practice these questions will become second nature, and the difference they can make to students will amaze you.



The important skills in nature education are those physical actions necessary to successfully carry out the process of discovery and investigation, evaluation and problem identification and problem solving.

In 1908 naturalist Anna Bosford Comstock wrote: “Nature-study is, despite all discussions and perversions, a study of nature; it consists of simple, truthful observations that may, like beads on a string, finally be threaded upon the understanding and thus held together as a logical and harmonious whole. Therefore, the object of the nature-study teacher should be to cultivate in the children powers of accurate observation and to build up within them, understanding” (as cited in Link, 1981, p.10). Simply put, students should be taught how to study nature like a naturalist.

Nature educator L. Conrad (1972) specifies the following steps to outdoor learning as observation, reflection and investigation.

Observation. First one must learn to see what is going on around them. The key to this process is alertness, the discipline of noticing everything. This includes what can be seen, smelled, felt, heard and even tasted. This practice puts students in direct contact with things to be learned and fills their minds with an array of rich impressions on which to think. This noticing naturally leads the student to the second step, reflection.

Reflection. Conrad (1972, p.18) explains, reflection involves “thinking about what you have seen and heard; wondering about it; turning it over and over in your mind; bringing to bear upon it all that you have previously known and thought about that thing and about other things parallel with it.” This kind of reflection usually gives rise to questions that bear investigation.

Investigation. Some may call this step the research process. In outdoor education this process begins by looking at the object in question in the environment and within the context with which it is found. It means one makes and revises guesses and looks for clues that might support each guess. It involves talking with other people who have seen the same things, looking in books and written materials, and persistently asking the question, “why?”

Unlocking nature’s mysteries. With these three tools students can delve into unlocking the innumerable mysteries of the natural world, experiencing the thrill of discovery and the satisfaction that comes from a patient and vigilant pursuit of understanding. Then, teachers, freed from the fear of not knowing it all, can participate with their students in the quest. As the Swiss philosopher, Amiel aptly stated, “The highest function of the teacher consists not so much in imparting knowledge as in stimulating the pupil in its love and pursuit. To know how to suggest is the art of teaching” (as cited in Link, 1981, p.9).

Conrad, L. (1972). Lloyd B. Sharp’s philosophy of education. In G. Donaldson & O. Goering (Eds.). Perspectives on outdoor education...Readings. (pp.16-20). Dubuque, IA: WM. C. Brown Company.

Link, M. (1981). Outdoor education: A manual for teaching in nature’s classroom. Englewood Cliffs, NJ: Prentice-Hall, Inc.



Teaching Strategies



Outdoor education necessitates the use of teaching methods that encourage learning by exploration, problem solving and direct experience. Joseph Cornell (1998), a naturalist and nature educator, believes the most stimulating classroom is the outdoor environment. “This classroom is equipped with expandable walls that extend as far as the learner’s legs want to carry him, and a floor that varies from locale to locale—sometimes rocks, or water, sometimes forest floor. Its ceiling, too, is varied with ever changing cloud shapes, or at night with a myriad of star patterns waiting to be explored. No schoolroom ever had the books or maps or charts to rival the vividness of the real world” (p. 2). The whole idea of having a nature studies program involves a shift not only in the location of the learning environment, but also in the strategies and methods of teaching. The following are a few simple guidelines that nature educators have found to be effective in helping kids explore nature.

- 1. Teach less, and share more.** We are told that telling is not teaching yet we insist on drowning the learner in a sea of words. There needs to be a focus on the experience, drawing children’s attention to many new things in their world and interesting them in nature, rather than expecting them to memorize long lists of trees and plants. That kind of learning is more meaningful when it emerges out of direct experience stimulated by the child’s own curiosity. The outdoor educator must be alert to the child’s interests and reactions, adapting lessons to capitalize on these interests. The philosophy being that you can plan what activities a child will do, but you cannot always plan what a child will learn from the experience. This is not to say that one should not have an overall goal in mind; but the idea of exploring nature should focus on discovery through investigation and inquiry.
- 2. Be receptive.** Listen and be aware both to the moods and feelings of the children and to what is happening in nature around you. Share with students your own sense of wonder and awe at what you observe. When we share with students our own ideas and feelings it encourages them to explore their own feelings, and perceptions, thus creating between student and teacher a mutual trust and friendship.
- 3. Focus the child’s attention without delay.** The instructor or facilitator must set the tone of the outing, making it a point to include everyone by asking questions and pointing out things of interest. Hammerman and Hammerman (1973) point out how children are naturally curious and for the inquiring mind of a child the quest for the what, the how, and the why of the world’s mysteries can be an exciting adventure in learning. A teacher doesn’t have to know all the answers: they just need to know how to use children’s questions to help them look more carefully. The teacher learns in cooperation with the student, and together they look for explanations to the mysteries found in nature. This method of exploratory learning is ideally suited for nature studies. Its basic premise is to involve the learners in finding out for themselves by asking their own questions and seeking their own answers.

Continued on next page.

4. Look and experience first: talk later. The order of these activities is important, often we spend a lot of time talking and explaining the activities so that little time is left to do the activity. The act of teaching in nature necessitates involving students in solving the mysteries of the natural world through exploration which involves all of the senses. Reflection on these experiences is essential and helps to make the outdoor experience richer and more meaningful, but it must come after the experience. It is difficult to reflect on what we have not seen or experienced; neither can we fully appreciate nor understand what we have seen without reflecting on it. Students derive greater meaning, substance and growth from their experiences when they spend time actively reflecting upon them.

5. A sense of joy should permeate the experience. Outdoor educators need to help students discover the joy and fun that can be had in the outdoors, the possibilities for imagination, the exhilaration and mental sharpness that comes from physical exertion and the fresh air. Experiences should not be so structured as to stifle student's ability to explore, but skillfully guided so as to open up new possibilities and discoveries which otherwise might go unnoticed.

6. Use questions to engage the learner. At the heart of an inquiry-based approach to outdoor education is the art of questioning. Good questions keep students engaged and involved in putting the pieces of the puzzle together. They involve both the student and the teacher in the learning process together as partners. The use of questions by the teacher helps the student accumulate evidence to be analyzed, sifted, and refined into basic concepts which lead to further broad generalizations. Through skillful questioning the student is lead to see, to think about what has been observed, to integrate and synthesize the important elements derived from the observations until a reasonable conclusion as to what happened can be formulated.

Engage the Learner with Questions



The following dialogue between a student and teacher helps to illustrate how the perplexity of a learner and the skillful questioning of a teacher can help put the pieces of a puzzle together in an interesting and exciting way.

Pupil: Wow, Mr. C., look what I've found! What is it?

Mr.C: Well, I don't know for sure. Let's take a closer look at it. (Mr. C. knows, he just isn't saying.) Here, look at it under this magnifying glass. What do you see?

Pupil: Well, I see a shell. It looks like a clam shell.

Mr. C: Look again. Is it actually a shell?

Pupil: Wow! There's no shell material. It's just an imprint on this rock. I wonder how it got there.

Mr.C: What else do you see?

Pupil: I see a lot of small grains.

Mr.C: What do they look like to you?

Pupil: It looks like cement, or sand maybe.

Mr.C: Here, let's scrape a little off with my knife. Now feel this. What does it feel like?

Pupil: It feels like sand. Yes, it's sand all right. This must be sandstone. I still wonder, though, how the shell imprint got in the stone. It must have taken tremendous pressure.

Mr.C: Yes, you're right. Let's pursue this a little bit further to see if I can help you figure out the rest of the puzzle. Where do you ordinarily find shells?

Pupil: Oh, along the beach. We go to Wildwood, New Jersey, each summer, and I've found loads of shells. In fact some of them even look like this one.

Mr.C: All right, now give this careful thought. See if you can use all the evidence we have thus far to solve this mystery. There once was a shell and now it is gone, but we have a clue in this fossil. What happened here?

Pupil (after considerable head scratching and brow wrinkling):

Well, here's what I think happened. Shells are found by the shore, and the waves wash them back and forth. Sometimes they're washed up on the shore, and some shells are washed back out to sea. I've watched the sand wash over the shells at the beach. I've seen some shells sort of burrow down into the sand, too. After a while more sand would settle to the bottom and cover the shells, and over time the sand and anything in it would gradually turn into stone.

Mr.C: You're doing fine so far, but what happened to the shell itself?

Pupil (who by now is completely caught up in the process of trying to solve the mystery):

Well, some of the shell would wear away from the sand rubbing against it. This would be like rough sandpaper wearing it down. I think, too, that the shell might be composed of something that dissolves in sea water.

Material presented in the guidelines was adapted from :

Cornell, J. (1998). Sharing nature with children. Nevada City, CA: Dawn Publications.

Hammerman, D. & Hammerman, W. (1973). Teaching in the outdoors. Minneapolis, MN: Burgess Publishing Company.