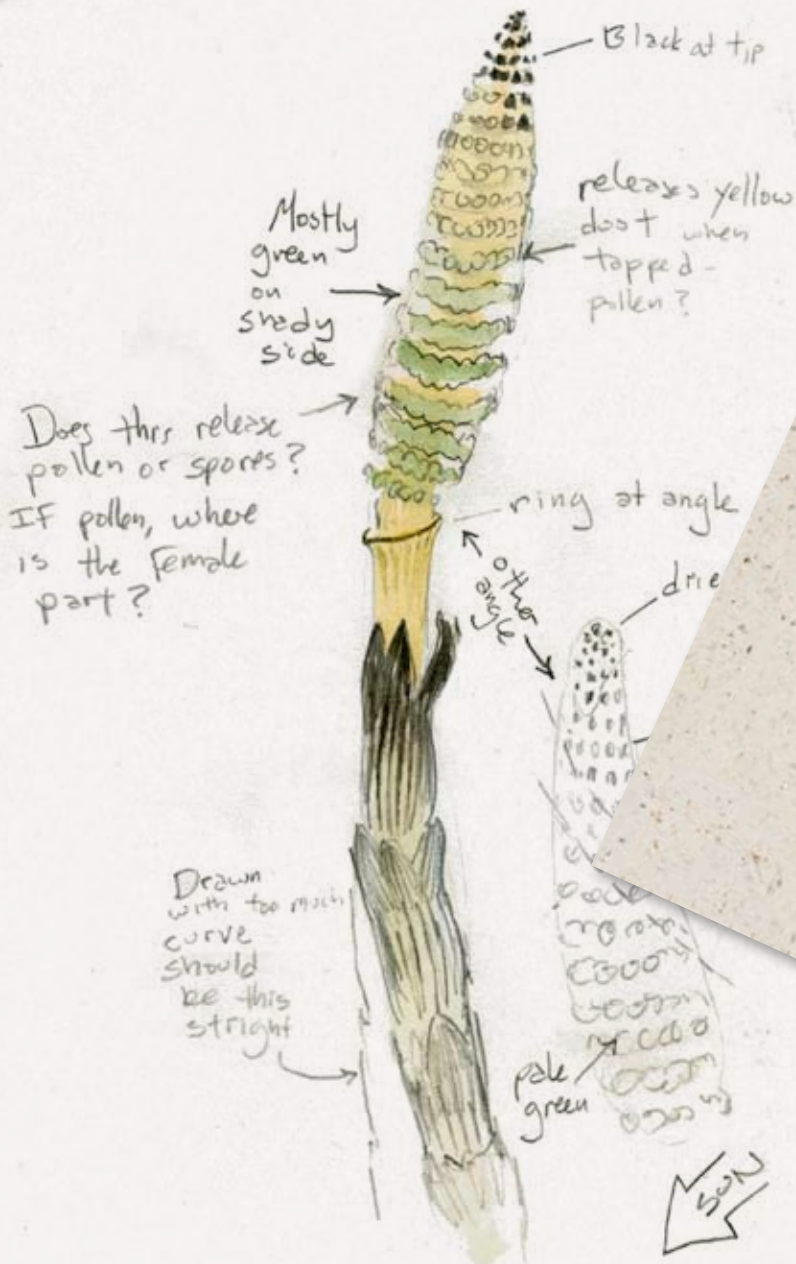


# OPENING THE WORLD THROUGH NATURE JOURNALING

INTEGRATING ART, SCIENCE & LANGUAGE ARTS



**AUTHORS**

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**CURRICULUM DEVELOPED BY**



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# Opening the World Through Nature Journaling

## Introduction

### FOREWORD

Kids need nature—and we, as parents, educators, and caring adults, need to provide it to them! It's a simple statement, but one that has become harder and harder to achieve in the world of standardized tests, electronics, and organized sports.

Our goal in creating this guidebook to nature journaling is to help adults and children discover (and rediscover!) the natural world through a combination of art, writing, and science. For years, John Muir (Jack) Laws has been developing his curriculum of nature journaling activities designed to engage students of all ages in sharpening their observational powers through sketching in the field. He has found that this combination of visual and kinesthetic learning reaches even students who had given up on their artistic abilities long ago.

More recently, the Language Arts component completed the experience. Jack began to work with Emily Breunig, an English and writing instructor, and exercises such as writing haikus, creating narrative stories, and formulating hypotheses came to complement the outdoor observational activities.

This interdisciplinary combination of art, science, writing, and observation exemplifies the California Native Plant Society's goals in creating educational programs: to engage students of all ages in the incredible natural world of California, to inspire them to keen observations of the wild places in their own backyards, and to foster in them a desire to protect these unique habitats.

We are very pleased to present *Opening the World Through Nature Journaling*, and we hope that it will help children and adults throughout California connect with their natural surroundings. In classrooms and parks and vacant lots

around the state, more and more people are taking up their sketchbooks and letting nature journaling guide their appreciation of the outdoors. As Beverly Black, a fourth grade teacher in the San Francisco East Bay Area, reports, "Since I've been sharing nature observation through journaling with my students, I've noticed that they are much more in tune with their surroundings. They're seeing more, asking more questions, and I think appreciating the natural world more. Nature journaling has been rewarding to me personally, and I hope that I can encourage my students to make it a lifelong passion as well."

May these activities bring the same passion to you and the children you love!

### INTRODUCTION

A journal or notebook is an indispensable tool in all branches of scientific investigation. Keeping a science journal sharpens and focuses observational skills and provides reliable documentation of past events. The process of carefully recording observations in a journal forces one to take note of things that otherwise may have been overlooked. A journal is where the researcher records and preserves what has been seen, done, and thought in the course of his or her work. Journaling, as part of a school curriculum, strengthens and refines students' cognitive skills by teaching them to observe, to become aware of what they have observed with all of their senses, and, to exercise their imaginations and critical skills through developing hypotheses to explain what has been observed. Observation is a skill that can be taught and developed.

Many people look casually but do not see the details of what is before them. A scientist must see deeply and recognize subtle differences. Human memory is unreliable. Details of the immediate past slowly slip from mind as they are replaced by more recent events. Memo-

ries of emotionally charged events may remain vivid, but even these are unreliable as records of data. Furthermore, what is only held in memory is lost at the death of an individual. Keeping a science journal not only sharpens and focuses observational skills, but also provides reliable documentation of past events. The process of carefully recording observations in a journal forces one to take note of things that otherwise may be overlooked.

If you introduce your students to taking notes in a field journal at the start of the academic year, the books can become a thread that links the whole year. As the seasons progress, you can record the changes you see in plants and animals around the school. Other notes such as weather and cultural events can also be recorded in your books. The journals can become a place for creative writing, scientific observations and personal reflections. If you encourage students to write personal material in the journals as in a diary, you can give them the option of folding a page over on itself to indicate that the contents underneath are something that they are not yet ready to share. If they later decide that they do want you to look at the page, they can unfold it and let you know.

Field journal projects can extend into larger classroom projects. One particularly successful one is to create a classroom guide to the plants and animals in your community. Students can illustrate, research and write up descriptions and notes about behavior of local species. All the students' work can be combined into one volume and photocopied to make books that can be sent home.

### SKETCHING IN FIELD JOURNALS

Drawing develops the skills that are necessary for good scientific observation. When drawing a subject, one

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looks again and again at the parts of the subject that are least familiar and beyond the gross contours or minimum features needed to identify the object. Counter intuitively, this is often most helpful when we are sketching what we think we already know! We are least likely to carefully observe those things with which we are the most familiar or which are easy to identify. We have all looked at poppies and robins, but how many of us have looked long enough and often enough to really know their structures or to have noticed the ring around the familiar robin's eye? By drawing a poppy or a robin, you force yourself to see it in all its detail. Trouble spots in a drawing may be warnings of a missed or poorly observed detail.

In addition to developing observational and documentation skills, there are many other benefits to keeping field journals that incorporate sketching. The first is simply that it is fun! Students love it, and teachers do too. Many teachers find that their students cannot wait to pick up their science journals and enthusiastically go to work. Because journaling activities are fun, students buy in and focus on their work, which leads to even stronger observational skills. Students will draw biologically significant details, such as leaf position or the angle at which stems leave a branch, features that they did not know were important and could have easily missed in a written account alone. Nature journaling can also help teachers reach students who may otherwise be underserved. Many students have difficulties with written language because of learning disabilities or limited English proficiency, difficulties that disappear when they move to other ways of communicating. Such students may excel in science journaling where they can express their observations non-verbally. Finally, teachers can directly, and easily, assess students' observational skills by looking at their journals. Journal pages record the quantity and quality of

observations. By setting clear expectations for journal entries, teachers can objectively evaluate and grade student work.

However, in order for kids to fully buy in to nature journaling—and in order for journaling to work its observational magic—they need to know that the goal of such drawing is not to make pretty pictures, but instead to accurately observe and record data. If the goal is to make pretty drawings, the pressure for pretty can get in the way of documenting observations. One becomes hesitant to start a sketch as the words of an inner art critic or memories of disparaging comments from a previous teacher ring in one's memory. Children (and many adults) will remember the thoughtless words of a teacher who dismissed their drawings with an offhand comment. For people who have been so discouraged, starting to draw again is intimidating. On the other hand, if the goal is to clearly and accurately observe and record observations without regard to whether it “looks good,” the pressure of producing ART is lifted, and the student's focus shifts to making and recording observations. Any drawing, however crudely executed, is a success if it enables the student to see more clearly or document his or her observations. In this way, students who do not consider themselves artists are liberated to draw without the pressure to produce a “masterpiece.” An interesting side effect of approaching science drawing in this way is that it frees students to draw. As a result, students do draw and their work improves with the practice.

The ability to draw well is not a gift. Drawing, and drawing well, is a skill. Like any other skill, it can be learned and will improve with practice. Keeping a nature journal is a part of the science curriculum in many European countries. There, students maintain regular logs of observations of the comings and goings of natural phenomena, e.g.,

weather, bird migrations, when plants bud, bloom, take seed, or drop leaves. As a result of regular practice, many adults continue to keep such journals into adulthood. Because simple sketching is a part of these journals, adults emerge from such a program un-intimidated by drawing and more likely to consider themselves artists. Were all of these adults somehow born with a “gift” for drawing? Not in the slightest. They honed their skill over time, through constant practice—and this is a skill that is available to anyone who devotes the time to achieving it.

### INTEGRATING LANGUAGE ARTS & FIELD JOURNALS

Language Arts, especially in these days of high stakes testing, is so often taught at the expense of other subjects. And yet, for our students to truly come to understand and feel comfortable with language, they need to encounter it and use it in a variety of situations. Language cannot be taught in a vacuum. Even the STAR test agrees; released tests show that students are asked to read and interpret passages entitled “Seeing in Stereo,” “Sequoias,” “Spotted Cats,” and even “Proper Care and Use of a Microscope!” Students who have never encountered a microscope, no matter how skilled they may be at taking standardized tests, are going to be at a disadvantage when faced with this question. But how can we realistically expect students to be able to handle this test question (much less the microscope itself) when their science time is continually being cut short?

In addition, the students who are missing out on science time are often those who are having the greatest difficulties with language. In California, that often means those who are classified as English Language Learners. However, we have found that the hands-on, visual nature of journaling and science has

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incredible potential to reach these students; they are at no linguistic disadvantage in observational nature journaling. Their powers of observation and insight can be employed just as those of other students. And, once engaged, tying this activity to language provides a relevant place to approach learning English, one in which students are already invested and already feel empowered and capable.

Science teachers often tell us that they feel a little shaky about their own Language Arts skill level—to say nothing of their ability to guide their students through the correct placement of commas, quotation marks, and periods. What we hope to provide here is an engaging and easy-to-implement curriculum that incorporates writing and Language Arts skills while relieving some of the fears that teachers—and students—may have about their writing qualifications. It's true: there is a proper way to use a semicolon. But what's just as true is that language belongs to us all, and, ideally, a child's education should make her more comfortable and confident in its use. In order for this to happen, formal and informal reading, writing, speaking, and listening need to find a place in every subject.

The Language Arts portion of this curriculum is designed to make it easier for you and your students to bring journaling back into the classroom from the field, playground, or garden so that the observational skills that you develop don't stop at the door. Some exercises include writing extensions that ask students to reframe their observations in words, an activity that not only provides writing practice, but one that reinforces the observations that they have already made. Others build off of journaling observations to ask students to question what it is that they have seen what they have learned, to carry the sense of wonder so easily sparked in the field into the lab, and to eventually, through

these questions, create hypotheses of their own (necessitating, of course, even more observation!). And some take that sense of wonder and quiet and encourage students to approach literature, and their own creative writing, with the same kind of attention and appreciation that they learn to exercise through their journaling experiences.

Finally, just as writing that comes naturally from students' own observations, thoughts, and questions is more compelling than that which does not, writing that reaches a larger audience is way more compelling than that which remains in the classroom. Writing about science, observations, and questions goes naturally into writing for a purpose. What do you do when you've realized that your school's garbage policy is affecting a local creek? How do you encourage your local community to participate in a recycling program? If you just learned that experts predict that climate change will have a significant impact on your state, how do you spread this information and encourage others to take positive action? Once students have identified these problems, they can compose letters to local officials, e-mails to news organizations, pamphlets and posters for display at their school and in their local community, and much, much more. Writing is among the most powerful tools of communication that we have, and students need to learn to use it to make the most of their education and their lives!

## USING LOCAL FIELD GUIDES

Children have an innate curiosity about the natural world. Many of us can vividly remember exploring a pond or looking for bugs in the back yard as a child. The open-ended nature of these explorations and the sense of discovery is an important part of what made these experiences so compelling. With the help of a field guide these explorations

can become rich introductions to biodiversity, helping students compare and classify what they have found while building observation skills. These activities tie directly to the 5th Grade State of California science framework content standards 6.a "Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria."

A set of guides in your classroom will enable your students to perform field investigations with the book. While it is a useful reference once back indoors, it is best used outside while observing the species you wish to identify. It is also preferable for students to have their own guide or a guide to share among a small group.

## HOW TO USE THIS BOOK

Field journaling activities are successful with both young students and adults. They have been successfully used in college field studies, adult education programs, and with third graders. When children are very young their artwork is symbolic. They will draw a peak roofed house to represent "my house" even if they live in a square apartment building. Around third grade (about eight years old) they make a transition to representational drawing where they start to draw what they see rather than the symbol. Once students have begun representational drawing, these activities can guide them into deep nature discovery. These activities address the most important science process skills and should be used at all grade levels to reinforce these skills even if they do not address specific standards of your grade level.

The field journaling activities do not need to be done in any particular order but can be selected to fit the teaching environment and objectives. The language arts extensions are paired with field journaling activities and are a good

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follow up. While most of the journaling activities need to be done outdoors, the language arts extension can be done either indoors or out.

Keeping a field journal develops and reinforces the most important science process skills—observation and documentation. All other parts of the process

of science depend on these skills. We assume that we are naturally good observers, but learning to really see what is in front of us is a skill that must be learned, developed, and practiced. Journal activities tie directly to the State of California science framework content standards and the visual and performing arts framework content standards.

Supplementary Language Arts activities are linked directly to the Language Arts standards as well. The full content of the state standards can be found at <http://www.cde.ca.gov/be/st/ss/>.

<b>ACTIVITY</b>	<b>GRADE/ AGE</b>	<b>TIME</b>	<b>SPECIAL CONSIDERATIONS</b>
Secret Plant Scavenger Hunt	3, 4 / 8 years-adult	45 min	outdoors in an area with a variety of plants
Team Observations/Observation Olympics	3, 4 / 8 years-adult	45 min	focused around one plant or natural object that can be observed by the whole class
Comparing and Contrasting	3-5 / 8 years-adult	45 min	follow-up to Team Observations/Observation Olympics”
Comparisons	3-4 / 8 years-adult	45 min	outdoors where you can find two similar species such as two species of pine trees
Writing Persuasive Paragraphs	3-6 / 8 years-adult	45 min	follow up to “Comparisons” activity
Making a Field Guide or Collection	3, 5 / 8 years-adult	45 min	outdoors in an area with a diversity of plants of animals
Who is that?	3-5 / 8 years-adult	45 min	integrating journal workk with field guides
Diversity Inventory	3-5 / 8 years-adult	45 min	integrating journal workk with field guides
Descriptive Paragraphs	3-5 / 8 years-adult	45 min	follow up to “Making a Field Guide or Collection” activity
Plant Time line	3, 6/ 8 years-adult	45 min	outdoors where you can find a variety of life stages of one plant
Plant, this is your life	2-5/ 8 years-adult	45 min	follow up to “Plant, this is your life” activity
Zoom in, Zoom out	3-4, 8 years-adult	45 min	outdoors or indoors with a variety of natural objects for students to observe
Don't miss the forest or the trees	3-5/ 8 years-adult	45 min	follow up to “Zoom in, Zoom out” activity
Nature's Treasure Map	3 / 8 years-adult	45 min	outdoors where students can hike along a section of trail
Writing Short Stories	3-6 / 8 years-adult	45 min	follow up to “Nature's Treasure Map” activity
Mapping	3,4,6,7 / 8 years-adult	45 min	ouddorrs where students can observe an area were some natural feature (creek, hill, etc.) effects plant growth
Cross Section	3,4,5,7 / 8 years-adult	45 min	ouddorrs where students can observe an area were some natural feature (creek, hill, etc.) effects plant growth
Timed Behavioral Observations	3-5 / 8 years-adult	45 min	outdoors where students can observe a group of animals for a long time (flock of birds, ground squirrel colony etc.)
Keep your Questions	4-5 / 8 years-adult	45 min	can be added to any activity
Wildlife Gesture Sketching	8 years-adult	45 min	anytime you discover an animal and want to focus student attention
Nature Comic Book	3,7 / 8 years-adult	45 min	after observing interesting animal behavior
Responding to Poetry	3-5/ 8 years-adult	45 min	after reading poetry together
You're a poet, and you should know it!	1-3/ 6 years-adult	45 min	after making nature observations, ideally using field journals to focus student observation

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#### HOW TO CRITIQUE STUDENT'S SKETCHES

When setting up journaling activities, we make sure to stress to students that it is not about making pretty pictures. Then arrives the moment when a student shows you his or her work. What is your spontaneous response? “Good job! That looks great!” While such a response may be appropriate to an art class, it is deadly in a science classroom. What is wrong with this kind of feedback? It emphasizes and gives positive reinforcement and encouragement to the precise activity that the students told they were not doing. While we told them that we were not interested their work looking pretty, our response demonstrates that that was indeed the actual goal. While students already comfortable with their artistic abilities will be encouraged in their artistic efforts, it sends the message to the other students that your stated expectations were insincere—just another adult trick.

Positive reinforcement can and should be given, but it needs to be given in a way that advances the goal of the

curriculum. You have told the students they are to observe and carefully record what they have seen; give positive reinforcement when you find accurately observed details in their work. “I see you have shown hairs on the stem. Details like that become important to botanists when identifying and studying plants.” Give positive reinforcement to scientifically useful information that students add to their observations such as date, location, time and weather information, size or scale information, color notes, multiple views of the same subject, or behavior or interactions with other species. “You have put a scale next to your drawing. That will really help you remember this plant when you review your notes.”

#### DON'T SAY:

“That is really pretty.”

“What a good drawing.”

“You are a great artist.”

“That looks so realistic.”

“You are really good at shading.”

#### DO SAY:

“The way you use both writing and drawing to describe this flower is really

clear.”

“I see you measured the distance between the branches and added a scale.”

“Oh, you found a spider on top of the flower! Great observation.”

“The insect damage on that leaf you have illustrated really helps me pick out which flower you are looking at.”

All the items in the “don't say” column may find a place in an art class, but there is no place for them in this setting. Here we momentarily put aside our art values to shift the students' focus, and in doing so, free them to draw. One final thought on talking to your class about their work. When reviewing a group of drawings with them, your attention will probably fall first on the most attractive pictures. There is a natural tendency to comment on such work in order of our aesthetic preference, beginning with the one we find most satisfying and ending with one we like the least. Students will quickly pick up on this. Instead, skip around among the drawings, keeping the focus always on the accuracy and completeness of students' pictorial and written recording of their observations.





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**ASSESSMENT**

A teacher can qualitatively assess work in field journals. If students are given clear expectations for a journaling project, you can make an assessment rubric to tally the number of required elements that students included in their work. Of course, some of the most exciting elements of journaling can only be evaluated qualitatively. Use the rubric as a starting point and adapt the idea specifically for your needs.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Check the required items for this journaling project. Add up the total points possible and put this number at the bottom of the page. Then have a classmate score your sketch and you score their sketch. Circle the point or points by the required items your classmate included. Add up the total points received and put the number on the line at the bottom.

**Baseline Data**

- \_\_\_ Date (1 point)
- \_\_\_ Place (1 point)
- \_\_\_ Weather/temperature (1 point)
- \_\_\_ Time (1 point)

**Sketch and Description**

- \_\_\_ Likeness of object (1 point)
- \_\_\_ Notes and descriptions (1 point)
- \_\_\_ Detail of interesting part (1 point)
- \_\_\_ Label parts (1 point or more \_\_\_)
- \_\_\_ Color or notes about color (1 point)



- \_\_\_ Identify object sketched (1 point)
- \_\_\_ Habitat sketch (1 point)

**Measurements**

- \_\_\_ Indicate size of object sketched (1 point)
- \_\_\_ Indicate parts that are life-sized (1 point)
- \_\_\_ If magnified, indicate magnification (1 point)

**Other Things to Include**

- \_\_\_ Connections (1 point)
- \_\_\_ Questions (1 point)
- \_\_\_ Other-specify (1 point or more \_\_\_)

Total points received: \_\_\_\_\_

Total points possible: \_\_\_\_\_

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### DRAWING TECHNIQUE

The purpose of field sketching is not to make pretty pictures, but there are techniques that you can share with your students that will help them to more accurately render what they see.

### SHAPE BEFORE DETAILS

When you start drawing, ignore the details and go for shape and proportions. Once you have sketched these in, turn your attention to detail. Start a drawing with fast ghost lines.” Sketch the whole form loosely and lightly. Accent the shapes that you like as they begin to emerge. Focus on trying to capture the basic shape, posture, and proportions at the start instead of focusing on details. Check your proportions early on. If you wait until you have added details, you cannot make changes without erasing significant amounts of work. The quick lines also help students get over the fear of putting the first mark on blank paper. Once you have the basic form, draw over the ghost lines to add detail. For example, When drawing a leaf start by getting the basic shape and proportions (length vs. width) and then add toothed edges over the shape. Draw the leaf veins last going from the mid rib to the tip of each tooth. Use a regular graphite pencil and draw lightly or use an erasable non-photo blue pencil such as Col-Erase” to make your initial ghost drawing.

### SKETCH VS. PORTRAIT

Students typically draw a single picture then continue working to improve. Instead, encourage them to make several sketches of the same subject each next to the other on the same page. They are not obliged to finish every sketch. Rough sketches can contain important information. Their impressions can be used for reference to make a more finished drawing later if they wish, but that is not the objective. The object is to focus on seeing accurately and recording what was seen. Their field sketches will not be perfect. Nor is there a need for them to correct their sketches by comparison to a field guide. Let their field notes stand for themselves as their best impression of what they saw on the spot. Altering the notes at a later date risks replacing observation with less reliable memory.

### ERASING

Discourage erasures. When students erase a picture, cross it out, or tear it from their notebook, they are destroying information that they have collected. If part of the sketch is inaccurate, they can instead add written notes or draw another detail of that part.

### MOVING SUBJECTS

When drawing a moving animal, work on one drawing until the animal moves to a different position, then start another drawing on the same page. If it

moves again, start another drawing. If it returns to a position you have already started to draw, go back to that drawing. The drawing on which you get the furthest along will probably capture the animal’s most characteristic posture.

### SIZE

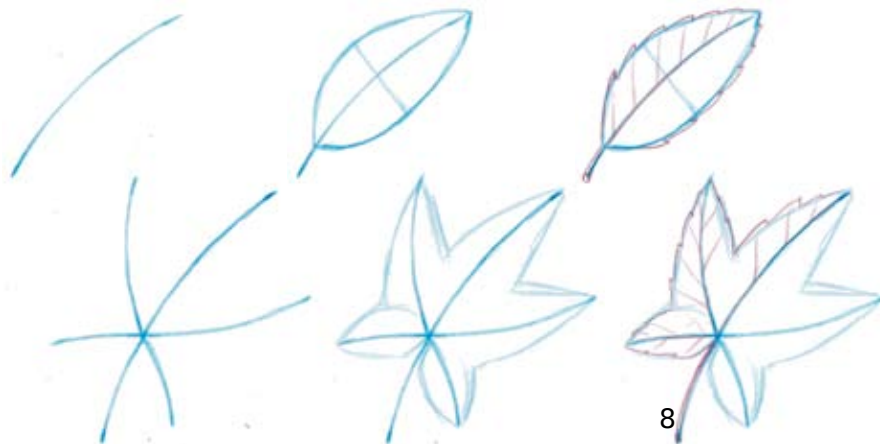
Many students will draw very small pictures. It is difficult to see or add detail to these cramped drawings. Encourage them to work larger, perhaps making enlargements of the objects that they are drawing. You may have to specify, I want the flower or bird drawn at least as large as your fist.” In contrast, students will often undertake too large a landscape drawing. Halfway through the project they tire of drawing trees. They will find smaller “thumbnail” landscapes perhaps 1”x 2” or 2”x 3” to be much more manageable.

### WRITING AND DRAWING

Sketching is an important tool to focus observations. If a drawing helps the student see something new or remember it later, then it is a success. The more that students draw, the more they will see. However, students who are more comfortable drawing should include writing in their notes as well, while students who prefer writing should include sketches and diagrams with their writing. Combining writing and drawing gives the pages less of the feel an art project and more of a place where information is collected. Spelling should not count either. Worry about spelling or punctuation in field notes only impedes the flow of data recording.

### SET AN EXAMPLE

Keep your own field journal and sketch while the students do. You can help them see sketching as a part of what a scientist does instead of just an assignment. Many adults are afraid to draw. If your journals are free of pretty pictures, your work reinforces what you have told the students; that the project is not



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about art. Nonetheless, as you continue to keep a field journal, you will discover that your drawing will rapidly improve and that the more you sketch, the faster that improvement will occur. Drawing is a skill developed by practice. Journaling is that practice. You can and need to do it.

### CONNECTING WITH ART LESSONS

If you are interested in developing art lessons to supplement science journaling, get a copy of *Nature Drawing: a Tool for Learning* by Clare Walker Leslie. The book contains a series of lessons and drawing projects that you can do alone or with your class. The basic drawing exercises at the start make an excellent beginning for any art class and the separate chapters on drawing birds, flowers, trees and more are very helpful.

### EQUIPMENT

Field journaling requires no special equipment. While fancy paper and drawing pencils can make students feel that they need to create art instead of record science, but some field supplies are useful. The most important is a good journal. If you can afford them, bound hardcover notebooks that students can use throughout the year and will stand up to field use lend dignity to the process of taking notes. You can also make your own journals as part of a class project. A journal should feel like something that one will continue to use. A clipboard of loose-leaf paper does not feel like part of a permanent record but if that is all you have, use it.

### OTHER EQUIPMENT

#2 pencils

Hand-held pencil sharpeners

Optional

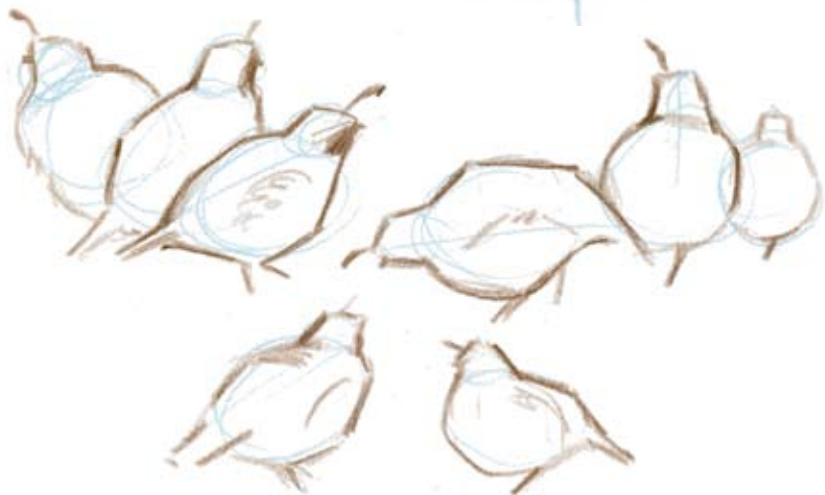
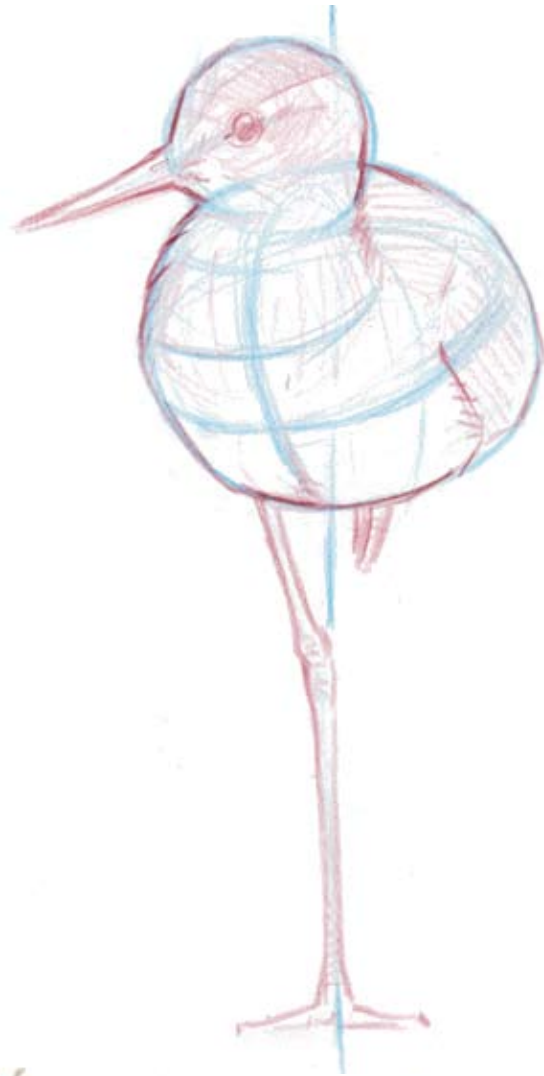
Colored pencils

Erasable non-photo blue pencil

Magnifying lens

### NON-PHOTO BLUE PENCIL

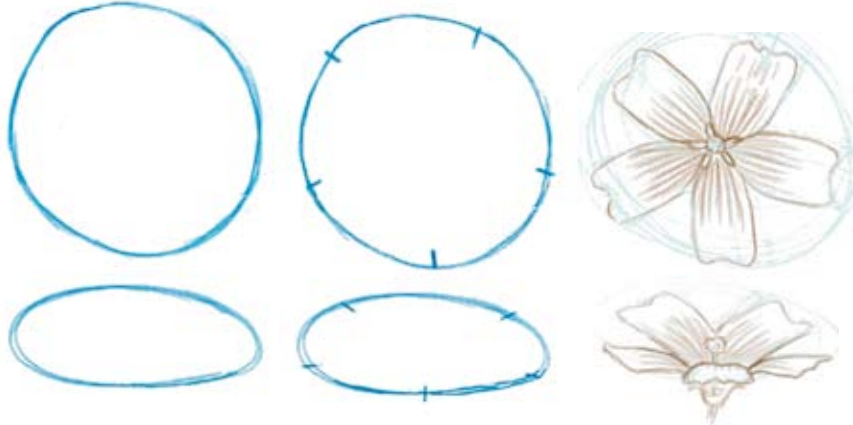
Make your starting lines, circles, and ellipses very light so you can draw over the guidelines without them showing up too much in your final drawing. A great trick is to make all these starting lines with an erasable non-photo blue pencil. It makes such light lines you will not need to erase them.



## DRAWING FLOWERS

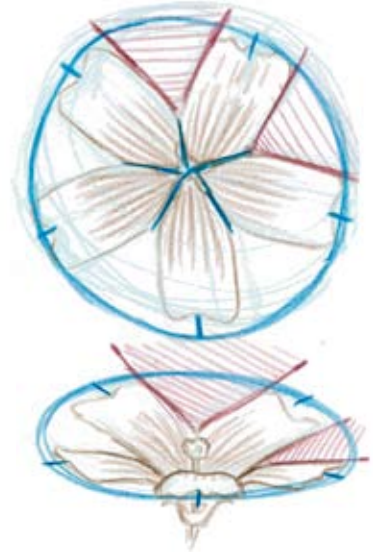
### START WITH A CIRCLE

Any part of a flower that you can simplify to a circle will help you get started in your drawing. Put tick marks around the outside of the circle to help you locate where the petals will come out. To draw a foreshortened flower, start with an ellipse instead of a circle.



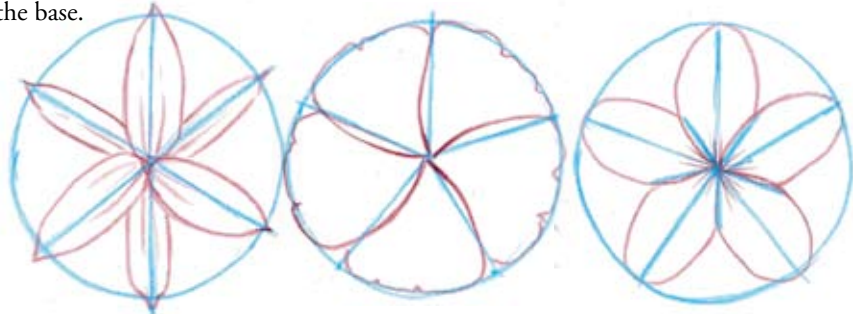
### NEGATIVE SPACES

To help you get the shape right, look for the shapes between the petals. Sometimes these angles are easier to see. Use them to get the shapes right and to double check you have the petals in the right positions and angles.



### GUIDES FOR PETAL TIPS OR EDGES

If the flower's petals are narrow, use lines from the middle of the circle to locate the petal tips. If the petals are broad, the same lines can be used to form petal edges. Use both center lines and edge lines for medium sized petals that overlap only at the base.



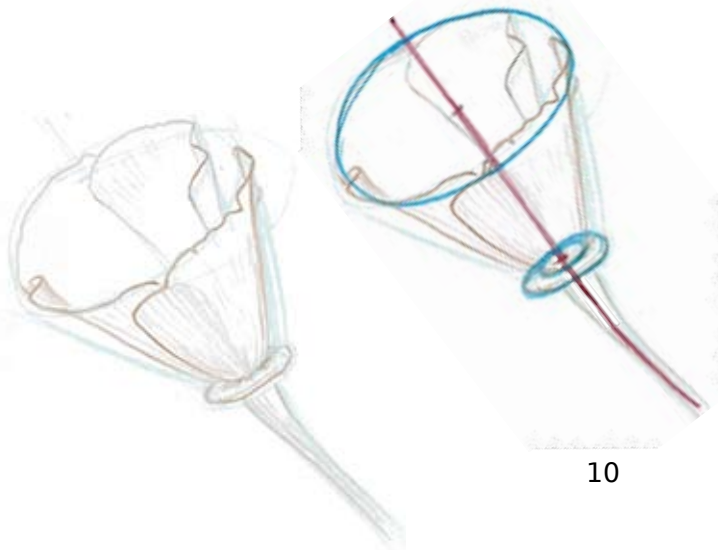
### MULTIPLE FLOWER SHAPES

A cluster of flowers will all be seen at different angles. Vary the shape and angle of the ellipses.



### CONE SHAPED FLOWERS

Many flowers are cone shaped. Use the circle and ellipse to draw them but notice that the center of the flower drops below the mouth of the petal tube when you look at a foreshortened angle. Keep track of the center line of the flower when you draw it from an unusual angle.

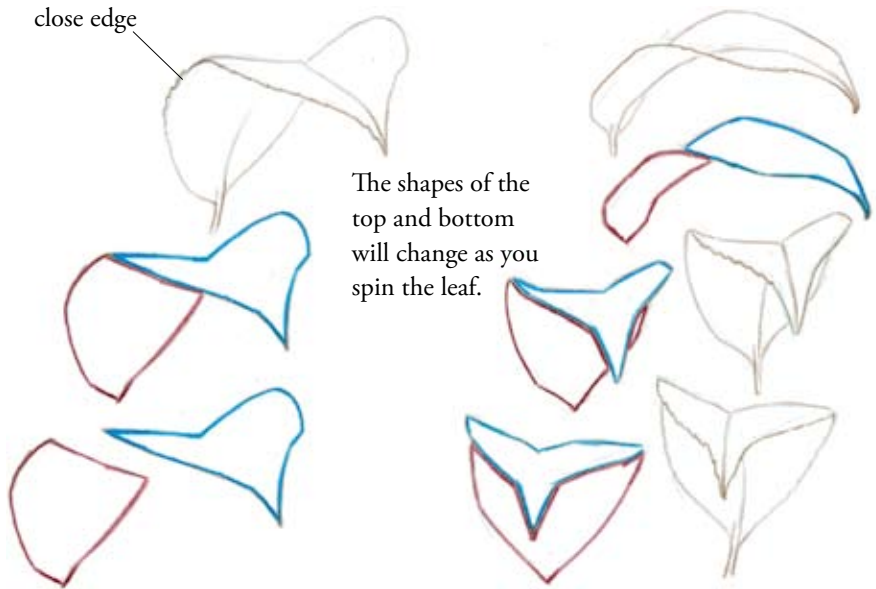


# Opening the World Through Nature Journaling

## Introduction

### FORESHORTENING LEAVES

To draw a complex foreshortened leaf, close one eye (to disrupt your 3D vision) and look at the leaf as two flat shapes that are placed next to each other. Then draw the close edge that unites the two shapes as one continuous line. Make draw several practice leaves as an exercise.

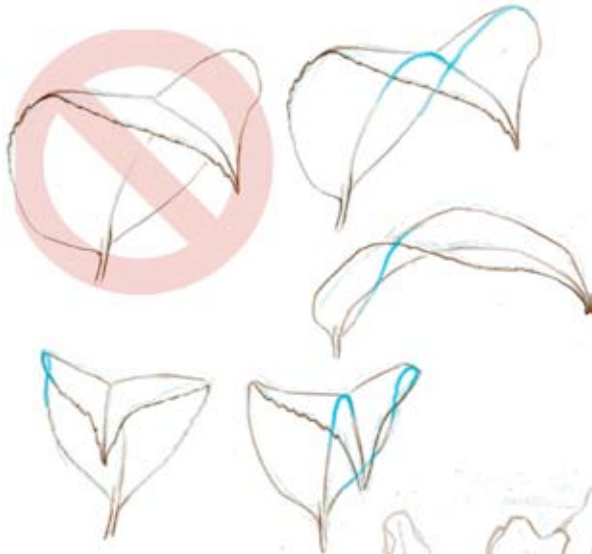


The shapes of the top and bottom will change as you spin the leaf.



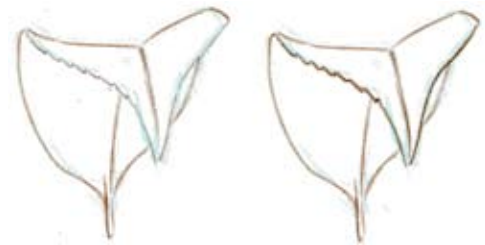
### SEE THROUGH THE LEAF

To make sure your mid-vein and the far side of the leaf emerge at the right spot, imagine what the curves of those lines do when they are blocked from your sight.



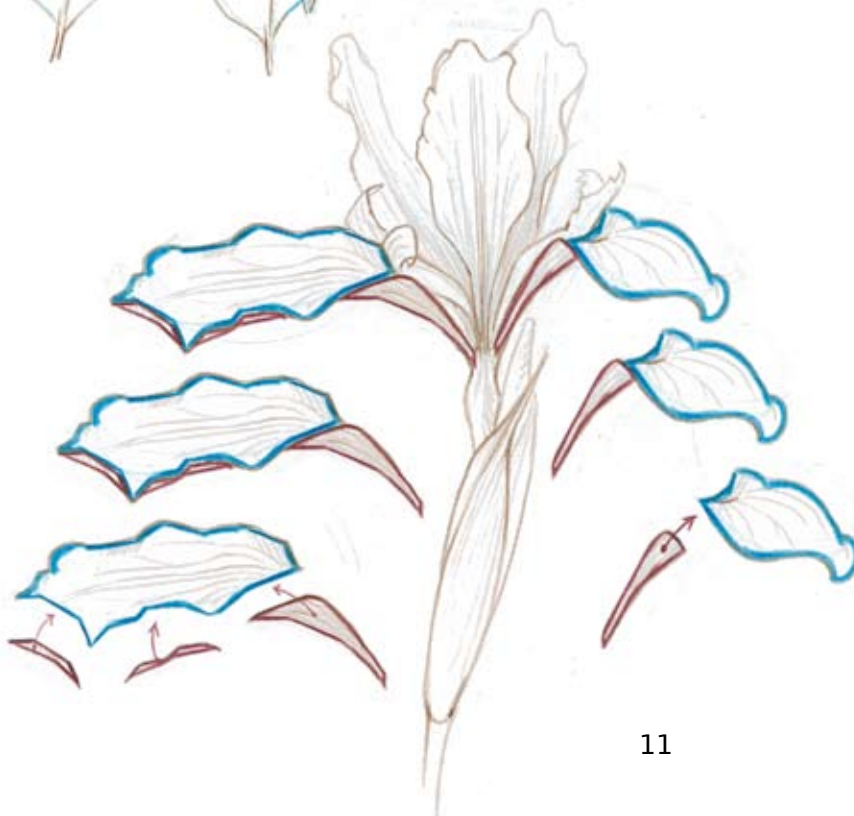
### 3D LEAVES

If your leaf or flower looks flat, try strengthening the edge that is coming toward you. This will make it pop out from the lines in the back.



### CURLING AND OVERLAPPING PETALS

Petals or leaves that curl and twist are challenging to draw. Try this approach: close one eye to flatten the three dimensional image to two. Think of the top surface a flat shape and draw it's edges. Draw the undersides in the same way, using the flattened shape next to that of the top. Train yourself to let go your thoughts about how the petal should look and record the shape as you really see it. These shapes will not look like petals on their own but put them together and a petal appears.



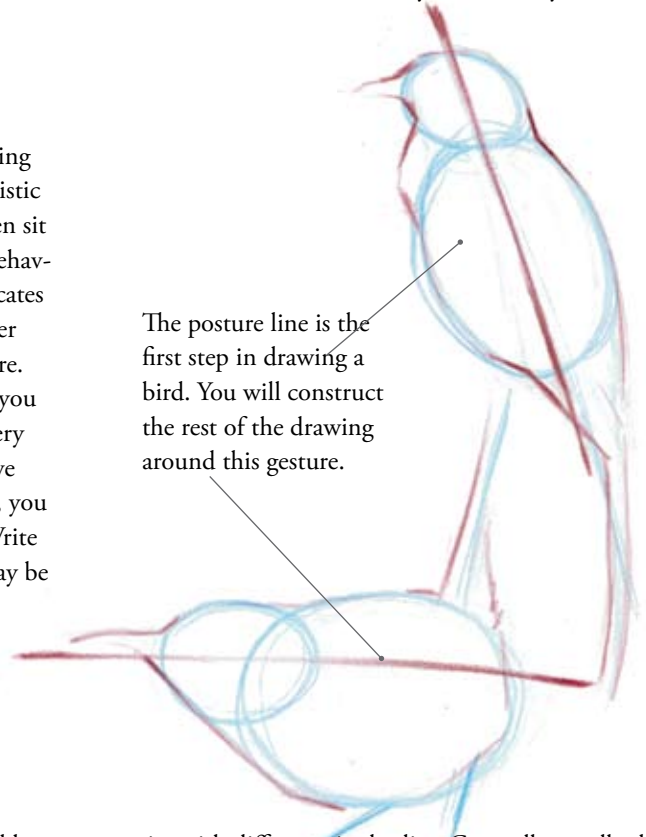
# DRAWING BIRDS

## SIMPLIFY A COMPLEX SUBJECT

Start a bird drawing by capturing the posture, proportions and angles. This initial drawing gives you the skeleton over which you draw details and your final lines. Instead of starting with details, begin your drawing by capturing the basic shape of the bird with as few lines as possible. Keep your first lines light and loose. You are not committed to these early marks. They are your guides.

## POSTURE- THE FIRST LINE

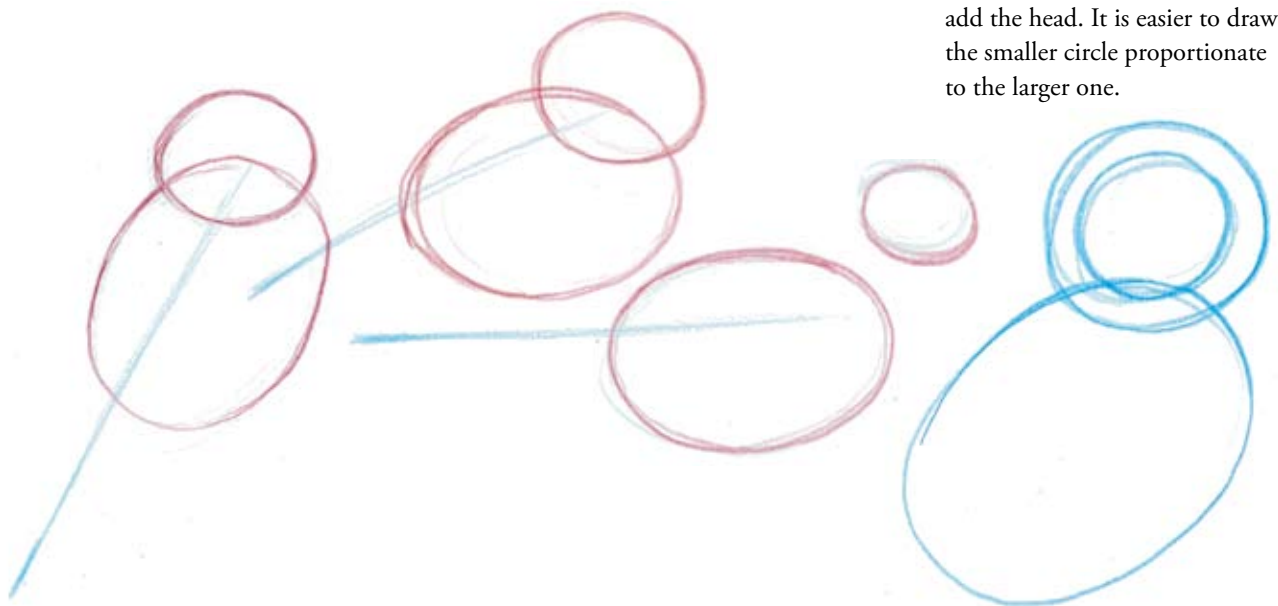
Your bird drawing starts to fly from the first line. Start your drawing by capturing the angle of the body. Posture Birds rest at characteristic angles: Scrub Jays sit vertically while a shrike or kingbird will often sit at a 40 degree angle. Postures change as birds perform different behaviors or face into the wind. Begin by drawing a faint line that indicates the angle of the head and body. You will build the drawing up over this line. If your drawing starts from a proper indication of posture. Your completed bird will also hold its body at the right angle. If you just start by drawing a beak and work your way to the tail. It is very unlikely that your resulting bird will convey the attitude of the live bird. If your subject flies away after you have drawn this first line, you already have conveyed something important about the subject. Write "jay posture at rest" or a similar note in your sketchbook. This may be useful to you some other day.



The posture line is the first step in drawing a bird. You will construct the rest of the drawing around this gesture.

## PROPORTION

Proportions can change within a species as it fluffs its feathers and between species with different size bodies. Generally, smaller birds will have larger heads. Relative proportions of a shrike, chickadee and magpie. If body size is held constant, the relative head sizes are different.



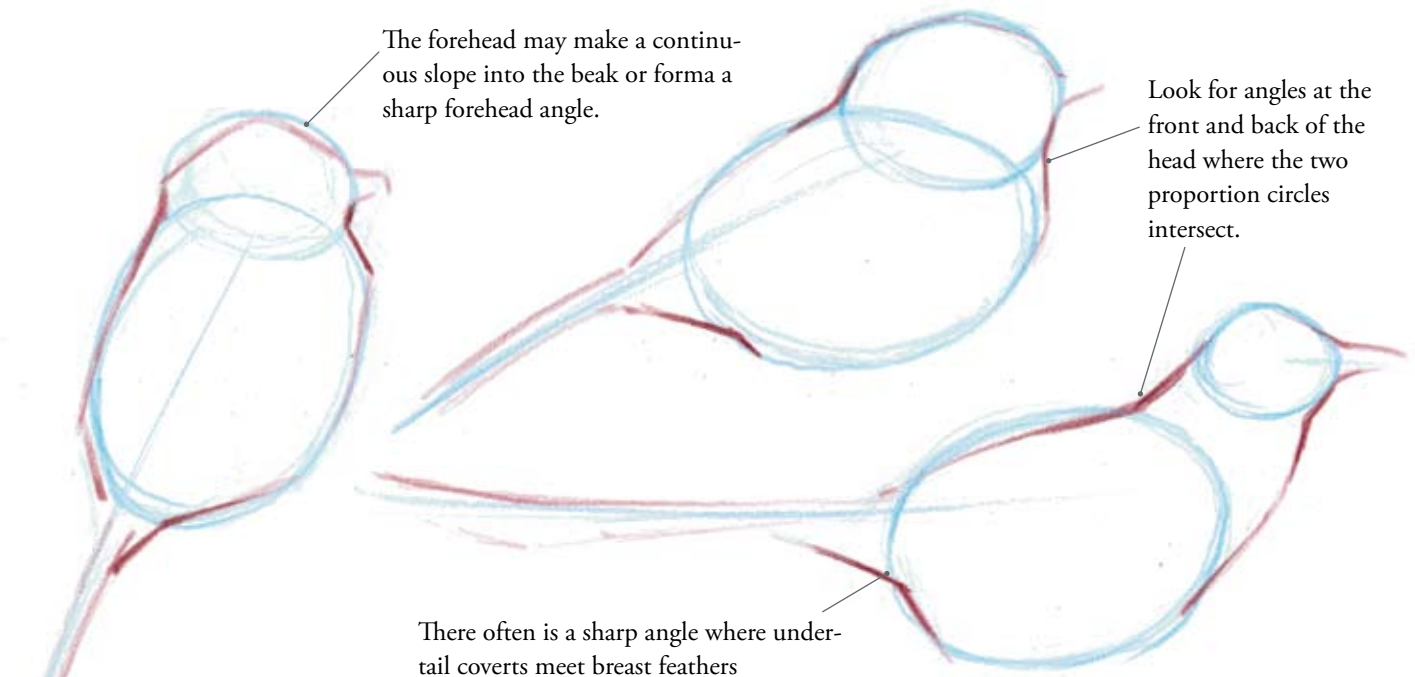
Draw the body first and then add the head. It is easier to draw the smaller circle proportionate to the larger one.

# Opening the World Through Nature Journaling

## Introduction

### ANGLES

Because you have built the body up with circles, it is easy to “over round” your bird. Look for angles where the head meets the body and the tail meets the body. Carve these into your proportion circles with straight lines. This is the point where your drawing will start to look like the real bird.

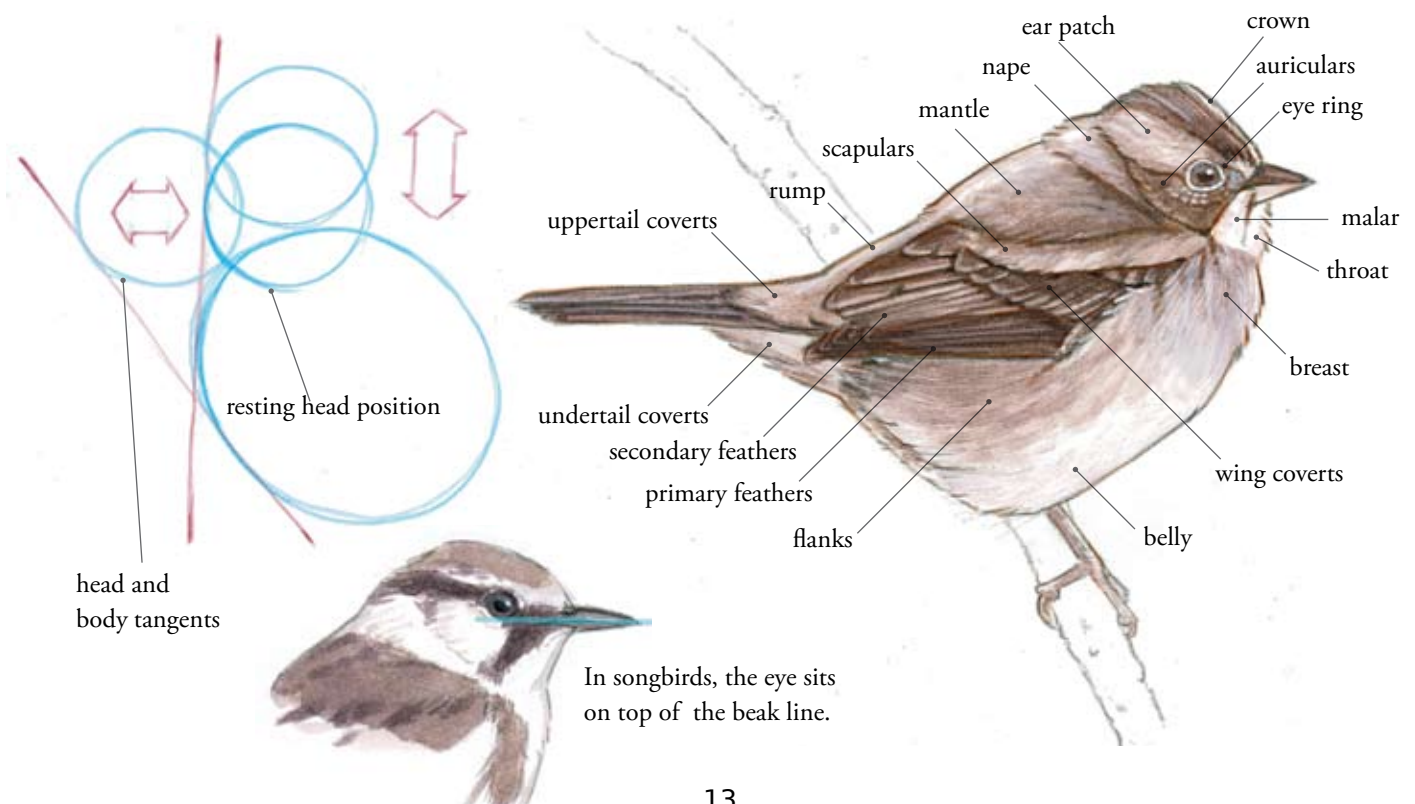


### HEAD POSITION

The head and the body are relatively fixed skeletal structures but the neck connecting them is extremely flexible. Head position will dramatically change the shape of the bird. Place the head with care.

### FEATHERS COME IN GROUPS

Feathers emerge in distinct masses or feather groups. The boundaries between these groups are often marked by subtle creases or color changes.







# FIELD JOURNAL ACTIVITIES: FOCUSED OBSERVATION

Sketching activities in a science curriculum are more effective and easier for students to handle in a structured format with well-defined objectives. If you just tell students to make a drawing of a plant, those who are comfortable with art will treat it like an art project but may not push their observation skills, and those who do not like art will shut down. Instead, students should be given explicit goals for a journaling activity that stresses looking at details and recording the data they observe. Field sketching activities take concentration and focus. If you work the students through several activities in a row, they may get exhausted and burn out. Instead, intersperse focused journal activities with hikes and other nature exploration. Once a walk up a hill tires them, the students may be more ready to sit down and focus again. Pay attention to weather conditions. If it is excessively hot, cold, or windy, students will be less capable of focusing on journaling activities. Use your own comfort level to gauge how they feel. Children are more susceptible to the effects of temperature. Be mindful that if you are hot, they may be verging on heatstroke. If you are cold, they may be in the early stages of hypothermia.

There are many ways to introduce journaling activities to your students. What follows are only suggestions of how journaling activity might be explained to a class. They should be modified and adapted to your own style. Start with activities that train students to accurately and intensely observe what they see. Observation is the most fundamental science process skill.

# SECRET PLANT SCAVENGER HUNT

## OVERVIEW

Students record detailed observations of a plant and challenge a partner to find the plant they drew.

## OBJECTIVE

This activity will get students to concentrate on details and drawing a real plant instead of simply reproducing a mental image of how a plant should look. Because the activity is presented as a game, it is a non-threatening introduction that gets everyone drawing and focused on natural details.

## PROCEDURE

Give Suggested Group Instructions. As students disperse, look for those who are spending too much time wandering around trying to choose a plant. They may need help. Pick a plant and say, “This one is good. Look, it has a bug bite on this leaf.” At the end of the time period, tell the students to find a partner. Important: if some students are still working on their observations and drawings, let them continue. They may be so absorbed in that part of the exercise that they want to continue. This is more important than finding the plant with a partner. Remind partnered pairs to show their partner the general area that their plant is in. The area will be smaller for a smaller plant, perhaps as small as a square foot. They can further narrow the search area if their partner has trouble. Once the partner finds the plant, the partner should point out what details were most helpful in finding the plant. When students return, ask the partners what details were most helpful to them. Students are often pleasantly surprised at their success.

## SUGGESTED GROUP INSTRUCTIONS

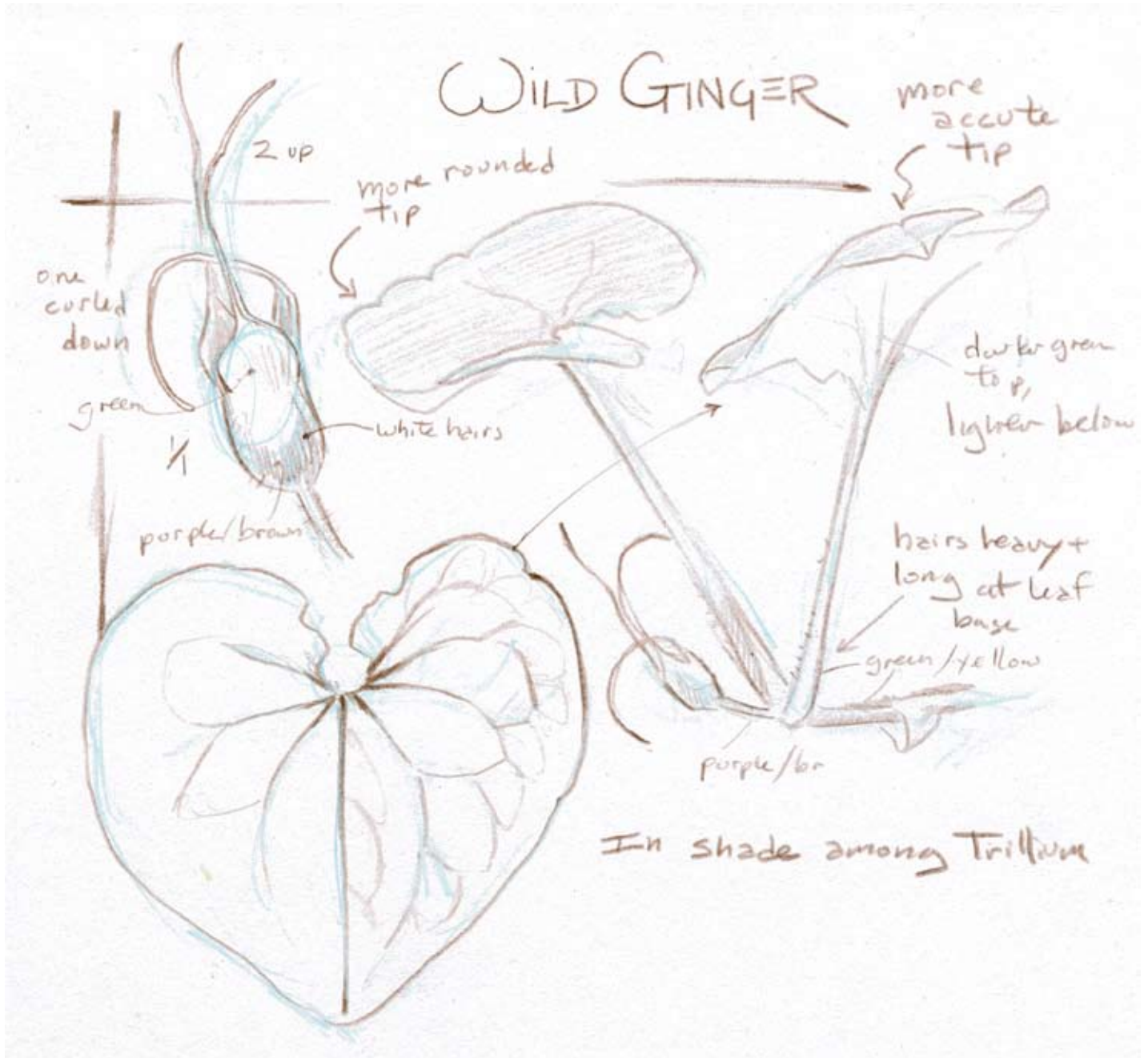
In the following instructions, as in those below, suggested times are given for completion. Those times are suggestions only and should be adjusted to suit the needs of the students and environmental conditions. “We are going to play a nature observation game. When I give the signal we are going to spread out and each of you will find a different plant to study. You will have fifteen minutes to record as much information about your plant in your journal using both writing and drawing. You want to be very thorough because at the end of the time period I am going to call you back to this spot. You will then select a partner, take your partner to the area you were journaling, and see if your partner can pick out the specific plant and not just the species that you were looking at just by comparing plants with your journal entries. Show your partner the general area that your plant is located in. Narrow down the area if your partner is having trouble locating your plant. Remember, the goal of this activity is to make drawings and notes that will make it as easy as possible for your partner to find the plant that you drew. Here are the boundaries for this activity.” Define boundaries so students will not wander too far. “If you would like to have a partner, make sure that the two of you are not sitting near each other while you are taking your notes. If you finish before the time limit is up, remain sitting and try to add a few more details. What might some of those details be?” Get suggestions from students: color and detailed notes, bent leaves, insect bites or discolored spots. “Any questions? Ready, set, go!”

## SCIENCE CONTENT STANDARDS

3rd Grade 5.b, 5.e

4th Grade 6.a

Opening the World Through Nature Journaling  
**Focused Observation—Field Journal Activity**



# TEAM OBSERVATIONS OR THE OBSERVATION OLYMPICS

## OVERVIEW

Students cooperate or compete to make as many unique observations as they can of the same species or individual plant.

## OBJECTIVES

Students explore the great variety and depth of observations that can be made of a single subject. Students also learn how other students looked at the same subject and how the focus of one person's observations differs from another's.

## PROCEDURE

Find a common object, such as an abundant species of flower, or one that all the students can observe at the same time, such as a tree. Give the Suggested Group Instructions. After ten minutes, assemble them away from the object they have been observing. For the cooperative data collection exercise, let each student report on what feature or features he or she found most interesting. For the competitive version, ask if anyone thinks they have an observation that no one else made. If so, what is it? Check to see if anyone else recorded, not just saw, the same thing. Ask who thinks they have the most observations. Let students read out their numbers. Ask if anyone has an observation that no one else has recorded.

## SUGGESTED GROUP INSTRUCTIONS (COOPERATIVE)

"You are a part of a science research team. We have discovered a new species of tree, flower, etc.. We need to record as much information about this species as we can, but we only have ten minutes to do so. All the observations we make must be entered in our journals, or they will not count. If we are all looking at the same features, those features will be covered very well, but other aspects of the tree will be missed. We want to record as much information as we can. If you wish, I will give you a moment to divide the work among yourselves. When you are ready we will start the clock."

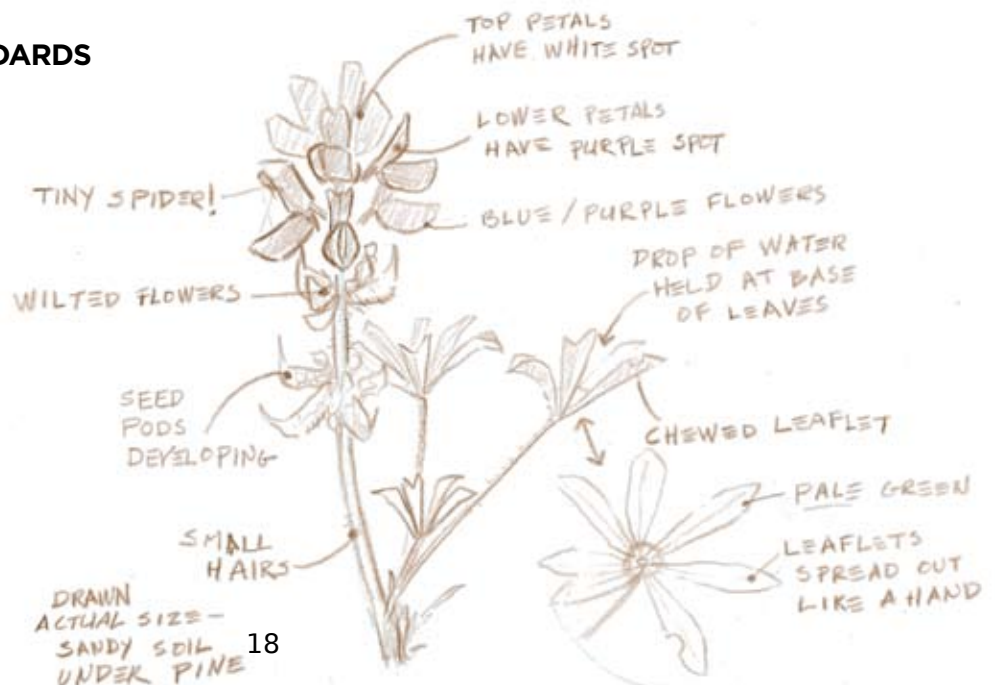
## SUGGESTED GROUP INSTRUCTIONS (COMPETITIVE)

"Welcome to the Observation Olympics! At the blast of my whistle, you, the nature Olympians will compete to see who can see what no one else sees. Here are the rules. Record as many observations of this Buckeye tree, species of wildflower etc., in your journals. You want to make as many unique observations as you can, observations that no one but you will make. Avoid observations such as 'this leaf has two spots on it' but look for features that have some general applicability such as 'leaves have brown spots surrounded by a pale yellow ring'. You win if you can make at least one observation that no one else recorded. Remember. If it is not recorded in your journal with a picture or in writing, it will not count. Any questions? On your mark, get set, tweeeeeeet!"

## SCIENCE CONTENT STANDARDS

3rd Grade 5.b, 5.e

4th Grade 6a



# COMPARING AND CONTRASTING

## OBJECTIVES

As a follow-up to the Team Observations/Observation Olympics” journaling activity, this exercise will help students further analyze their observations in comparison with those of a partner. Students will take a closer look at what they saw, what they missed, and the incredible variety of things to observe in any given exercise.

## BACKGROUND

While completing the Team Observations/Observation Olympics” journaling activity, students will be working to be the best observers they can possibly be. However, even though all students are engaged in the same tasks, they are very unlikely to all notice the same exact set of details. This can be a wonderful opportunity to practice compare/contrast writing, as well as a chance to focus on each student’s individual observation strengths. This activity is best done outdoors in the field, where the possible observations are effectively unlimited, but it can also be done in a more controlled classroom setting with designated material for observation, such as plant or rock samples, microscope slides, classroom animals, etc..

## MATERIALS

Writing materials

Journal entries from Team Observation/Observation Olympics” activity

Similarities and Differences Graphic Organizer (student pages) or a Venn diagram

Compare/Contrast Writing Scaffold (student pages)

## PREPARATION

Complete the Team Observations/The Observation Olympics” activity. Have a form of graphic organizer prepared that is appropriate to the setting in which students will be doing this activity. This writing activity can be done in the field immediately after the corresponding journaling exercise, while continuing to observe the subject, or it can be done in the classroom with the journal entries as a foundation.

## PROCEDURES

Explain to students that now that they have completed this journaling activity, they are going to use writing to compare their observations to those of their team members. Form small student groups (pairs are ideal) and hand out one graphic organizer per pair. Have students first look for observations that they had in common and write these down in the similarities area of the graphic organizer.

Next, have students identify observations that they did NOT have in common. Designate one side of each chart for each student and have them record their unique observations. In pairs, have students write three basic paragraphs about what they have recorded; one each about their individual observations, and one about the observations they had in common. The focus here will be on making generalizations: were they both focused on big things? Small things? Was one student looking lower on a tree, while the other was focused on the top? Give evidence for the generalizations that they are making. Younger students may instead write one paragraph that can contain all of this: what did each student see, and what did they both see?

## EXTENSIONS

Have students answer the following: given the similarities and differences, if you had another observation task, what specific jobs would you give to each member of the team, and why? Use evidence from your notes to back up these job assignments.

## ENGLISH, LANGUAGE ARTS STANDARDS

3rd Grade Writing 1.1, 2.2

4th Grade: Writing 1.1, 1.2, 1.3

5th Grade Writing 1.2

## SCIENCE CONTENT STANDARDS

3rd Grade 5 a, c

4th Grade 6 a

# COMPARISONS

## OVERVIEW

Students find two specimens of the same species, branches, mushrooms, flowers, grasses, etc., and draw them side-by-side, noting differences between them.

## OBJECTIVES

By comparing two similar objects, students find differences between objects and see variability within a single species. By looking for differences within species, students are forced to observe more closely and are introduced to the concept of environmental and genetic variation.

## PROCEDURE

This activity is best done in a location where you have access to many individuals of the same species, such as a patch of buttercups. Give Suggested Group Instructions. Set boundaries and time limits as needed. Depending on the level of focus of the students allow twenty to forty-five minutes. Regather the students to discuss the subtle differences that they have found. Discuss differences in appearance due to environmental and genetic factors.

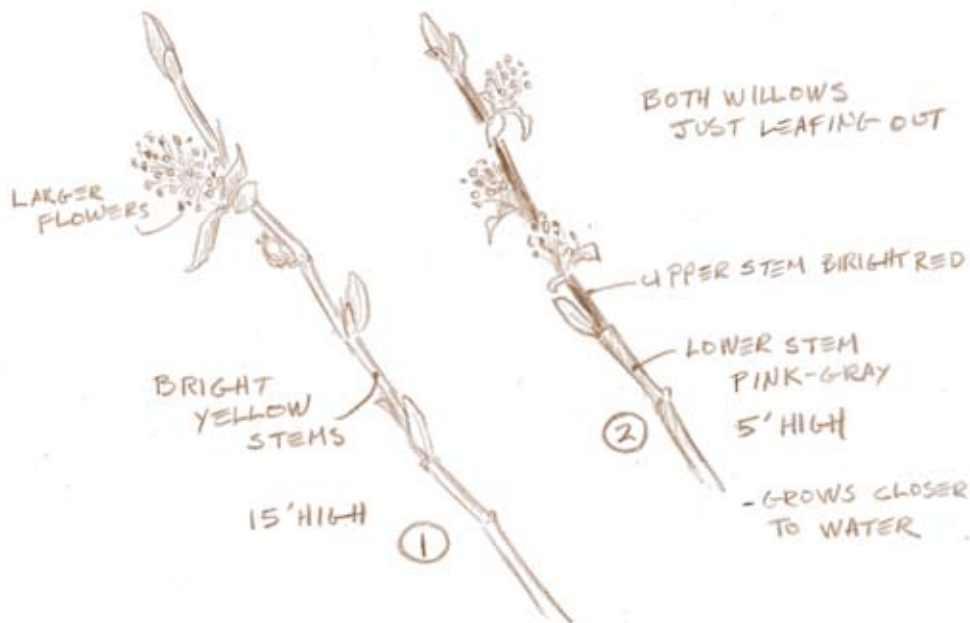
## SUGGESTED GROUP INSTRUCTIONS

“We are used to seeing differences between individual humans. None of us look alike. There are differences between individuals of other species as well, but we have to train our eyes to see them. No two flowers in a meadow, mushrooms on a hill, or leaves on a tree look exactly alike. Here’s your challenge. Find two similar appearing flowers, leaves, mushrooms, grasses, etc., of the same species. Make a careful diagram in your journal of each side-by-side. If they are small, you may want to draw them larger than life size. Look for as many differences between them as you can find and point them out in your drawings or written notes. You are going to have to look very carefully because the differences will be very small. If you are drawing a live plant, do not pick it but make your drawing while it is still rooted in the ground.

## SCIENCE CONTENT STANDARDS

3rd Grade 5.b, 5.e

4th Grade 6a



# WRITING PERSUASIVE PARAGRAPHS

## OBJECTIVES

After completing the nature journaling “Comparisons” activity, students will use their notes to write a persuasive paragraph or short essay about why individual members of the same species are not identical.

## BACKGROUND

Often, students spend a lot of time identifying plant and animal species based on stylized images or single photographs rather than real life examples. While this builds a base of knowledge that can be brought to the field, it tends to de-emphasize the huge amount of variation that exists between members of the same species. This writing exercise is designed to be completed following the nature journaling “Comparisons” activity. Students will create arguments based on their own observations and scientific illustrations.

## MATERIALS

Writing materials

Journal Entries from “Comparisons” activity

Original plants for further observation (optional)

Similarities and Differences Graphic Organizer (student pages) or Venn diagram

## PREPARATION

Complete the “Comparisons” activity in the field or in the classroom using two or more members of the same species. This writing activity can be done in the field immediately after the corresponding journaling exercise, while continuing to observe the plants, or it can be done in the classroom with the journal entries as a foundation.

## PROCEDURES

Explain to students that they are going to use their illustrations and notes from the “Comparisons” journaling activity to help others understand the wide variety of differences that can exist between members of the same species. Have students organize their observed similarities and differences into an appropriate chart. Using this chart, tell students that their job is going to be to write a persuasive essay or paragraph to explain to other students why individuals of the same species are not the same, even though we might think that they are. (Possible out-of-class audiences here might be a younger class, another grade-level classroom, a school newspaper, etc.) Encourage students to cite their own observations as evidence (i.e., “On June 24th, I observed two daisies in Mariposa Grove, and they had different numbers of petals”).

Extensions

Ask the students: “If these individuals are so different, what’s the point of learning about species in the first place? What does that do for us as scientists and observers?”

Ask the students (shifting the focus to similarities): “Why are these individuals, despite their differences, members of the same species? Make a checklist or a description of what they have in common that might help someone identify another unique individual as a member of that same species.”

Have students consider familiar species, such as dogs, cats, or even humans. “Do we make the mistake of thinking that all members of these species are the same? Why not? And what are the characteristics that all dogs, for example, share that help to categorize them all as members of *Canis lupus familiaris*?”

Have the students make a verbal argument or presentation about why individual members of one species are not identical. Again, use observations as evidence, and instruct students to cite their own observations (i.e., “On June 24th, I observed two daisies in Mariposa Grove, and they had different numbers of petals.”)

## ENGLISH, LANGUAGE ARTS STANDARDS

3rd Grade Writing 1.1, 2.2

4th Grade Writing 1.1, 1.2, 1.3

5th Grade Writing 1.2, 2.4

6th Grade Writing 2.2, 2.5

# MAKING A FIELD GUIDE OR COLLECTION

## OVERVIEW

Students make a field guide or an illustrated collection of common natural objects, e.g., flowers, tracks, etc., highlighting differences between species.

## OBJECTIVES

Students record a small part of local biodiversity and develop the basic skills to distinguish between species.

## PROCEDURE

Show the students a field guide. Note how simple, clear text and drawings show distinguishing characteristics. Give the Suggested Group Instructions and set boundaries and a time limit as needed. Forty-five minutes is a good average time.

Students already collect things; model planes, marbles, etc. This activity taps into that aspect of their interests. It is open-ended and can be done in areas, National Parks etc., where you cannot physically collect specimens. Students can instead make illustrated collections of what they find. They are not restricted to the obvious plants and flowers. They might include tracks, insects seen in a particular patch of flowers, things that are red, patterns in sand or snow, things with a strong smell, insect galls, cloud shapes, or insects under rocks.

This activity can be a continuous one and does not have to be done all at one time or in one place. If some students finish long before others, suggest that they try to include another plant or add more detail to the notes that they have already taken. Students may begin entries at the start of a hike and add to them throughout the day or continue adding to them on subsequent days. Once students start a collection, they may feel compelled to enlarge it. Encourage that energy.

A collection becomes a field guide if you can identify and label the species in the collection. After students have completed their work, regroup, review their work, and identify the species that they have drawn. Depending on the age of the students, you may want to introduce common versus scientific names. There will be much greater interest in identification after students have drawn their plants.

## SUGGESTED GROUP INSTRUCTIONS FOR DIRECTED FIELD GUIDE

“Each of us is now going to make a field guide to wildflowers (grasses, lichen, trees, tracks, etc.). You do not need to know their names, but you do need to look closely enough to see the differences between different species of flowers. A field guide compares kinds of flowers, not individual flowers. Your drawings should show the differences between each species of flower, not differences between individual flowers of the same species. To get started, try to include at least four to six flowers. Are there any questions? Let’s begin.”

## SUGGESTED GROUP INSTRUCTIONS FOR OPEN ENDED FIELD GUIDE

“Each of us is now going to make a field guide. You can choose whatever topic you want like, wildflowers, grasses, lichen, or trees. You do not need to know the names of whatever you draw. We’ll get to that later, but you do need to look closely enough to see the differences between species. You can also choose creative topics such as things that are red, animal tracks, things with a strong smell, or types of spider webs, etc. First you need to pick a topic. Let’s take two minutes to look around the area for each of you to decide what you are going to put in your field guide. When we come back we will each say our topic. Let’s go look.” Reassemble. “OK, let’s share our field guide topics.” Students give topics. Make sure the topics are ones in which the students will be able to find enough material. “Remember that a field guide compares kinds of things, such as different kinds of plants, not individual plants. Your drawings should show the differences between each kind of plant, not differences between individual plants of the same species. If you are studying spider webs, for example, look for ones made by one kind of spider and compare those with webs made by other kinds of spiders. To get started, try to include at least four to six subjects in your guide. Are there any questions? Let’s begin.”



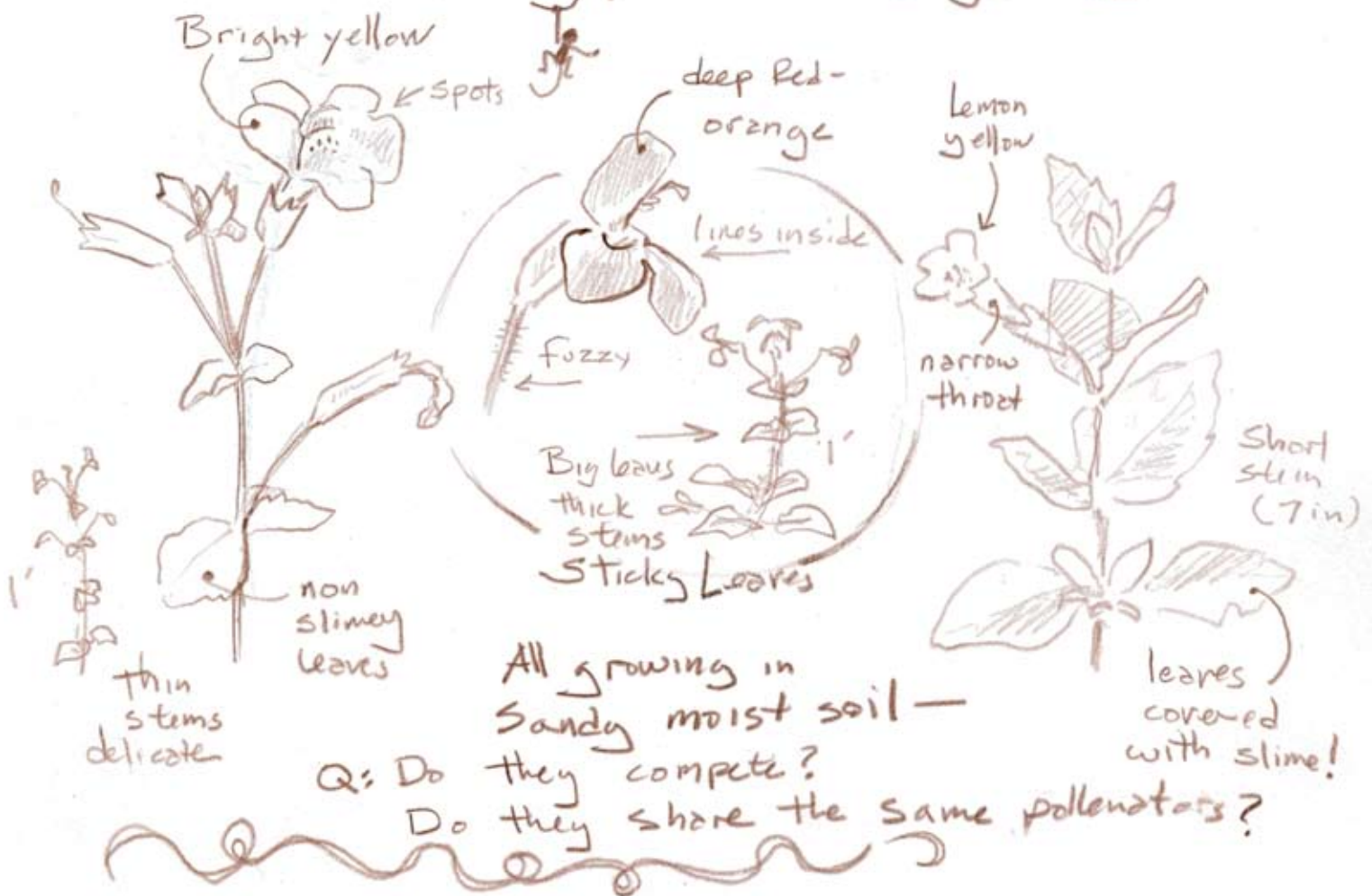
Opening the World Through Nature Journaling  
Focused Observation—Field Journal Activity

SCIENCE CONTENT STANDARDS

3rd Grade 5.c

5th Grade 6.a

# Monkey Flowers of Big Creek



# WHO IS THAT?

## OVERVIEW

Students record detailed observations of a plant or animal while in the field, then use a field guide to identify the species they drew using the data they recorded.

## OBJECTIVE

Students explore biodiversity and develop identification skills. If students cannot identify species based on their field notes, they learn what sort of information to collect in the future to facilitate identification.

## EQUIPMENT

field guides, student journals

## PROCEDURE

This activity can be done any time an unknown plant or animal is seen that captures a student’s curiosity. Students record their observations in their journals and compare their field notes with field guides to try to identify what they see. If they cannot identify what they have seen from their notes, they should consider and make notes of what they should look for and record the next time to clinch the identification. Students can give an unidentified species a “working title” or name for use until it is identified.

A second variation of this activity is to define boundaries for students (depending on the group, this can be as simple as “within earshot” or a more clearly defined area if students may tend to wander) and give them a sufficient period of time to record observations of an unidentified species in order to identify it later using a field guide. In this case, each student records information about any species within the physical boundaries that catch their interest.

## SUGGESTED GROUP INSTRUCTIONS

Students will ask: “What is that?” Respond with: “Let’s find out! Get out your field journals and record as much information as you can. We will use all our notes later to find it in our field guides. Use both writing and drawing to record information about it. Remember, you may notice some detail or behavior that no one else sees, so put down everything that you think might help us identify it.”

## SCIENCE CONTENT STANDARDS

3rd Grade 3.b, 5.e

4th Grade 6.a

5th Grade 6.a



# DIVERSITY INVENTORY

## OVERVIEW

Students inventory plants and animal diversity in two areas and compare the number of species and the abundance of individuals within a species.

## OBJECTIVE

Students evaluate biodiversity by measuring both the number of species (species richness) and the relative numbers of individuals within each species (evenness).

## EQUIPMENT

Enough copies of a field guide for student teams of two to three persons. Field notebooks.

## PROCEDURE

Divide the class into teams of three to four students. Define activity boundaries and set a time limit (20 minutes to an hour). Students will use field guides to identify as many species of plants, fungi, and animals as they can and estimate the number of individuals within the boundary you have set. Unidentified species should also be tallied as “unidentified tree #2” or “unidentified bird #5.” Repeat the activity with an area that is the same size in a different ecosystem. Discuss which ecosystem had the greatest number of species. This characteristic of an ecosystem is called “diversity.” Also note if one habitat was dominated by a few species such as one species of tree, or if there were more equal numbers of several species. This characteristic of an ecosystem is called “evenness.”

## SUGGESTED GROUP INSTRUCTIONS

“We are now going to test our nature identification skills by doing a scientific study of this forest. We will start by making a list of as many species as we find. Instead of trying to identify everything, choose a few groups like trees, shrubs, birds, or wildflowers. Within those groups make as comprehensive a list of all the species you see within the boundaries of the study area. Once you have finished your list, count (preferred) or estimate the number of individuals within each species. Once you complete one group, start a second group. Your team can decide what groups you want to do and in what order.”

Mathematical Extension Diversity can be measured and described in several ways. Both species richness and evenness can be calculated mathematically. Species richness is easy. Just count the total number of species (not individuals) observed. Calculating evenness is much more complicated and involves familiarity with logarithms. Calculating evenness may be appropriate for some high school classrooms. Consult statistical manuals or do a web search for instructions to calculate evenness.

## SCIENCE CONTENT STANDARDS

3rd Grade 3.b, 5.a, 5.b, 5.c, 5.e

4th Grade 6.a

5th Grade 6.a

# DESCRIPTIVE PARAGRAPHS: PART I

## OBJECTIVES

Students will use their field guide illustrations and notes from “Making a Field Guide or Collection” to create written descriptions for a complete field guide. Through this exercise, they will practice writing descriptive paragraphs containing information about the organism, such as where it can be found, what it looks like, how you might identify it, etc.

## BACKGROUND

In the “Making a Field Guide or Collection” activity, students practice using their observational skills to identify members of different species. In this exercise, they will turn their visual observations into written descriptions intended to accompany their illustrations in a field guide. As in a field guide, these descriptions will consist of verbal descriptions of the species, as well as extra important information, such as details about its life cycle, habitat, predator/prey relationship, etc. Students may also make field guides to non-living aspects of the environment, such as minerals and rocks, streams, soils, etc.

## MATERIALS

Writing Materials

Journal entries from “Making a Field Guide or Collection” activity

Field guide written descriptions for examples (optional)

## PREPARATIONS

Complete the “Making a Field Guide or Collection Activity” in the field.

This writing activity can be done in the field immediately after the corresponding journaling exercise, or it can be done in the classroom with the journal entries as a foundation.

## PROCEDURES

Ask students what sorts of information they might want to find in a field guide. Suggestions here to get them started might include details about life cycles, seasonal habitats, migration, germination, formation, what a species looks/tastes/smells/feels/sounds like, or other species likely to be seen nearby.

If available, show students several examples of different field guides.

Direct their attention to the field guides that they have started in the “Making a Field Guide or Collection” activity. Explain to students that they are going to be writing a description for each species to complete their field guide. The description will have two paragraphs: one that includes a physical description and other identifying details (such as smell, feel, etc), and another that includes any additional information that a reader might find interesting as they use this guide to explore their surroundings (where it can be found, seasonal variation, behaviors, etc.).

To prepare for each paragraph, have students use graphic organizers as they brainstorm important details. They can use their journals and the observations and sketches that they have made, along with any physical examples that might be in use. If desired, this can easily be done in pairs, small groups, or even as an entire class.

Once they have a brainstormed list for the first paragraph, have students begin putting these details into sentences. Depending on their literacy level, other scaffolding may be needed. One possible scaffold is to ask students to write one sentence per sense about how they perceive the species/object to create a five-sentence paragraph. An introductory sentence can be added for greater complexity.

Repeat this process for the second paragraph. If additional scaffolding is needed, have students pick a specific number of extra details (where the organism can be found, other species nearby, etc.) and write one sentence per detail. Again, an additional introductory sentence can be added if desired.

## Opening the World Through Nature Journaling

### **Focused Observation—Language Arts Extension**

Have students read each other's paragraphs and follow any other revision process that you use in your classroom. Have them type or write the final draft neatly to go with the corresponding illustration in their field guide or collection.

#### **EXTENSIONS**

This activity is designed so that students only need their journals and personal observations to write about each organism. Try extending it to include a research portion in which students spend some time learning about their organism from different resources, and then add more information to their second paragraph.

Be collaborative! Have each student contribute one description and illustration to create a classroom-created field guide.

#### **ENGLISH, LANGUAGE ARTS STANDARDS**

3rd Grade Reading: Word Analysis, Fluency, and Systematic Vocabulary Development: 1.0, 1.5

Writing Strategies: 1.1, 1.2, 1.4, Writing Applications: 2.2, Writing Applications: 2.2

4th Grade: Writing: 1.1, 1.4, 1.10, and 2.3, Written and Oral English Language Conventions: 1.1, 1.2, 1.4, 1.6, 1.7

5th Grade Writing Strategies: 1.6, Written and Oral English Language Conventions: 1.1, 1.4, 1.5

# DESCRIPTIVE PARAGRAPHS: PART 2

## OBJECTIVES

Students will use their field guide descriptive paragraphs as instructions for another student's illustration. The goal is to create a paragraph that describes the drawing—and allows for reproduction—as accurately as possible, thereby practicing writing and observational skills.

## BACKGROUND

Accurate scientific writing is an important skill, and this activity is designed to help students develop that skill. They will generate writing that corresponds to their own journal sketches for the “Making a Field Guide or Collection” activity and, in order to make this writing as descriptive as possible, use it as instructions for a fellow-student's own illustration. Students often find that this kind of “test” of their written descriptions shows them many ways in which they can make their own writing more scientifically accurate and specific.

## MATERIALS

Writing materials

Journal entries from “Making a Field Guide or Collection” activity

Blank paper for student partner to create the second illustration

## PREPARATIONS

Complete the Making a Field Guide or Collection activity in the field.

## PROCEDURES #1—DESCRIPTIVE PARAGRAPH

Tell students that they are going to write a descriptive paragraph about their illustrations for their field guide, and that it is very important that they make this writing as descriptive and accurate as possible. (For best effect, don't tell students beforehand that their paragraphs will be used as illustration instructions.) Ask class to come up with some characteristics of a good, scientific description. Characteristics might include measurements, good detail words, description of sense impressions (what an organism looks/smells/feels/tastes/smells like), use of color, etc.

Give students ample time to choose one of their field guide/collection illustrations to describe.

Have students write a descriptive paragraph on a separate piece of lined paper, encouraging them to use as many good details to describe their illustration as possible.

After the paragraphs are completed, collect them and distribute them to a second student. (It is most effective if students are paired with those who do not sit nearby!) Hand out sheets of blank paper, or have students use another page of their journals. Tell students that they are going to use the description that they have received to make an illustration. Instruct them to follow the description as closely as possible and not to add anything extra.

Have pairs meet and see how well their paragraphs helped their partner to recreate their illustration. Where was the description accurate? Where was it misleading? What did it include? What did it leave out? Praise students for details that were accurately conveyed and ask them if they see a way to make their descriptions more accurate.

An optional next step is to have students rewrite their paragraph and switch again to see if they can help another partner to be more accurate in his or her illustration than the first partner.

## PROCEDURE #2—WRITING DETAILED INSTRUCTIONS

In this variation, students will create a step-by-step list, based on their journal sketches, to help a partner reproduce their drawings.

Instruct the student that they will be creating a set of instructions to help a classmate across the room reproduce their favorite sketch. Tell them that it is extremely important to pay attention to the details that they include. Have them brainstorm impor-

## Opening the World Through Nature Journaling

### Focused Observation—Language Arts Extension

tant details that they might want to put in their step-by-step descriptions.

Allow students to write their step-by-step procedures for reproducing their drawing.

Have them switch with a partner who isn't sitting nearby and make a sketch in their journals from their list of instructions. Remind students that they are only to do what they are instructed to do, even if they recognize the species that is being described.

Allow students to meet with their partners and see what turned out accurately and what did not.

As a class, discuss what successful instructions looked like. What kinds of details were most helpful? Were there any surprises? What kinds of details didn't actually explain much?

If desired, have students make a second procedure list and exchange with a different partner to see if they can improve accuracy.

### **ENGLISH, LANGUAGE ARTS STANDARDS**

3rd Grade Writing Strategies: 1.2, Writing Applications (Genres and their Characteristics): 2.2, Written and Oral English Language Conventions: 1.1, 1.2

4th Grade Writing Strategies: 1.1, 1.4, 1.10, Written and Oral English Language Conventions: 1.1, 1.2

5th Grade Written and Oral English Language Conventions: 1.1



# PLANT TIME LINE

## OVERVIEW

Students follow the process of budding through fruit development by looking at plants in different states of growth.

## OBJECTIVES

By comparing plants in different states of flower to fruit development, students can construct models of plant development. This activity helps students focus on the function of plant parts and change through time.

## PROCEDURE

This activity is best done in a field of wildflowers of the same species. Give the Suggested Group Instructions for the first part of the exercise and set boundaries and a time limit. Students will draw one flower in the peak of its bloom. Regroup and discuss the function of flowers (attracting insects for pollination). Now give the second part of the Suggested Group Instructions. Students will try to find buds, blossoms, and developing fruit to make a complete chronology of flower-fruit development.

If you have access to one plant over weeks or months in the spring you can construct a time line for that individual. This can be done with plants in the schoolyard or potted plants in the classroom. When the plant is in bud, draw it in detail, date the drawing, and record the weather. Leave room for more drawings and notes on a two-page notebook spread. Visit the plant over a series of days, weeks, or months. What changes are noticed from one visit to next? Record changes as the plant comes into bud, leaf, flower, or fruit. Are there also changes in the rate at which change occurs?

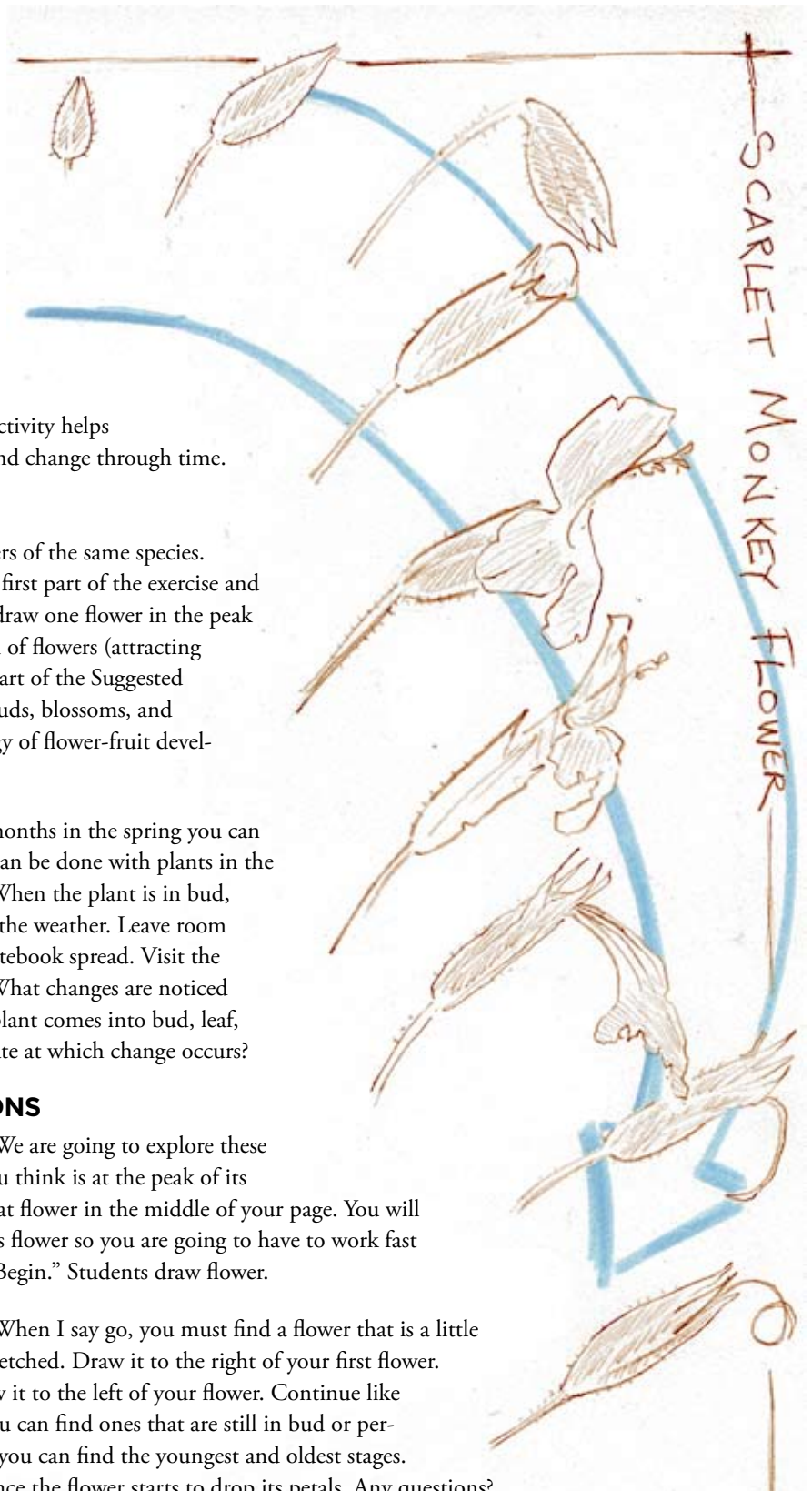
## SUGGESTED GROUP INSTRUCTIONS

“What a beautiful field of California Poppies! We are going to explore these with our nature journals. Find a flower that you think is at the peak of its bloom. Make a careful diagram or sketch of that flower in the middle of your page. You will only have seven minutes to find and sketch this flower so you are going to have to work fast and accurately. Get out your journals. Ready? Begin.” Students draw flower.

“Now we are going to take this a step further. When I say go, you must find a flower that is a little further developed or older than the one you sketched. Draw it to the right of your first flower. Then find one that is a little less open and draw it to the left of your first flower. Continue like this, adding flowers on either side and see if you can find ones that are still in bud or perhaps even producing a fruit. We want to see if you can find the youngest and oldest stages. You will need to look carefully; it gets tough once the flower starts to drop its petals. Any questions? You have fifteen minutes (or more) to see how far you can take it in both directions. Ready? Go.”

## SCIENCE CONTENT STANDARDS

3rd Grade 3.a, 5.e  
6th Grade 7.g, 7.h





# PLANT, THIS IS YOUR LIFE!

## OBJECTIVES

Students will use the observations and journal entries made in the activity “Focused Observation Secret Plant Scavenger Hunt” in order to write the life story of a plant.

## BACKGROUND

As students will find in the corresponding journaling activity, plants go through dramatic changes as they pass through their life cycle. These changes can be observed by watching one plant over time or by finding plants at various stages of the life cycle in one location. Students can use these observations to construct a story around the life of a plant.

## MATERIALS

Writing materials

Journal entries from “Focused Observation Secret Plant Scavenger Hunt”

Secret plant for further observation (optional)

## PREPARATION

Complete the “Secret Plant Scavenger Hunt,” in the field. This activity can be done in the field, immediately after the corresponding journaling exercise, while continuing to observe the plants, or it can be done in the classroom with the journal entries as a foundation.

## PROCEDURES

As a group, write out the major events in a plant’s life cycle (e.g., seed being buried, watered, and then sprouting; emerging from the ground; growing leaves and shoots; flowering or producing cones; dropping seeds; wilting; dormancy. You can also include the idea of decomposition and what happens during this period. As necessary, brainstorm or list the major stages for younger students to be sure they include all of them.

Next, think about other kinds of significant events that might happen in a plant’s lifetime. Could a plant have an encounter with an insect or animal? What kinds? What might they do to the plant? What about other plants in the same area? What else can students think of that might be important to them if they were plants

Have students make a list of the unique features of their secret plant, based either on observing the plant in combination with the journal entry, or based on the journal entry.

Ask them to think about what they think may have caused these unique features to exist. In the example of a bug bite, what kind of bug do they think bit the leaf, and why? If a stem is crooked, could that be related to water or to the sun? When in the plant’s life cycle do they think that these features may have appeared?

Now, using their scientific journals and observations, have students write their plant’s life story. Remember to use both facts and imagination. For example, does their plant have a name? Any nearby friends? Students may choose to write this story in the first person, from the plant’s point of view, or in the third person, as a separate narrator.

This exercise can be tailored to various types of writing. For example, if students are practicing scientific writing, you may choose to have them write a detailed story with focus on observation and hypotheses, leaving out any personification inherent in writing a more imaginative story. Should students be working on improving their narrative writing, however, the focus may change again, and characterization, etc. may be emphasized.

## ENGLISH, LANGUAGE ARTS STANDARDS

3rd Grade Writing: 2.1 (Write narratives) a, b, c

4th Grade Writing 2.1 (Write narratives) a, b, c, d

5th Grade Writing 1.1 (Create multiple-paragraph narrative compositions) a, b, c

## SCIENCE CONTENT STANDARDS

2nd Grade 2c, d, e

3rd Grade 3 a, c

4th Grade 2b, c; 3a

# ZOOM IN, ZOOM OUT

## OVERVIEW

Students investigate and draw an object in three scales and observe how features move into and out of focus at each scale.

## OBJECTIVES

By focusing at three levels of magnification, students will make different types of observations. We can easily get stuck at one level of focus in our observations and drawings. Some people are more apt to zoom in on details while others typically get the big picture. This activity teaches students to move across levels of focus, e.g., from small details to habitat and the range of observations shifts at each level of focus.

A hand lens, loop, or magnifying glass is useful but not essential. Having a magnifier for the first time is sometimes distracting.

## PROCEDURE

Stand at a distance from a plant where you can see it in its habitat. Ask students to offer the range of observations possible at that distance. Walk up to the plant. Ask students to offer their observations from close up. Compare the changing range of observations taken at different distances. Give the Suggested Group Instructions and set boundaries and a time limit as needed. At the conclusion of the activity, discuss why it is important to change the level of focus. How might the students apply this to other activities?

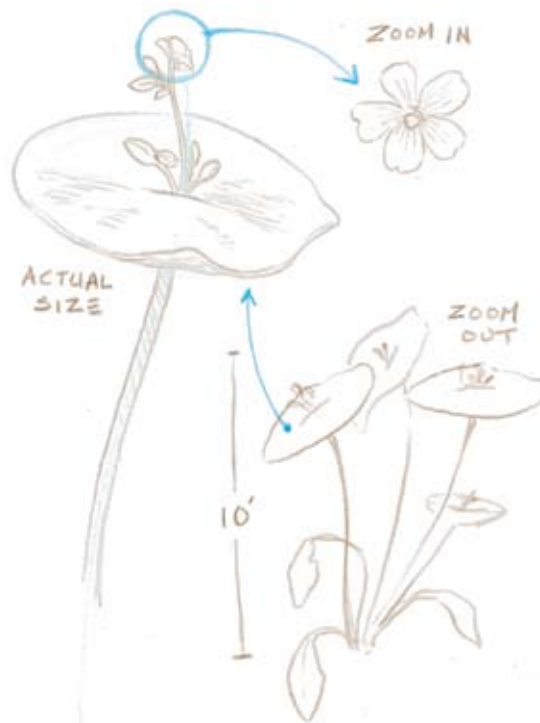
## SUGGESTED GROUP INSTRUCTIONS

“In the middle of your page draw a view of your subject that is exactly life size. If the object is larger than your page, only draw part of it. Add some written notes. Then choose some part of the subject that you find interesting and draw a little circle around that part of your drawing. At the side of the paper, draw a larger circle and draw a magnified view of that same area showing details that are too small to be shown in the life size picture. Include written notes. Finally, take a few steps back from the plant and make a final sketch, this time zoomed out to take in the whole plant, and some of its environment. Use both writing and drawing. We are looking from three levels of focus, life size, a magnified view, and a more distant view, all on the same page. Now let’s see what you observe by changing your level of focus.”

## SCIENCE CONTENT STANDARDS

3rd Grade. 5.b, 5.e

4th Grade, 6.a



# DON'T MISS THE FOREST OR THE TREES!

## **OBJECTIVES**

The “Zoom In, Zoom Out” journaling activity is intended to push kids outside of the usual scale they use to make drawings, and, in doing so, heighten their observational skills. In this activity, they will reflect on what they’ve observed while zooming in and out and consider situations in which this new technique would be useful.

## **BACKGROUND**

Many students tend to work on the same scale all the time when they draw, and when doing observational nature journaling, this can limit their observations. “Zoom In, Zoom Out” is intended to encourage kids to work in different scales, first by drawing what they are observing at its actual size, then by zooming in and out to examine it from close up and further away. By doing this, students often find that they notice details that they would usually miss.

In this accompanying writing exercise, students will reflect on what they noticed as they zoomed in and out. Were there details of a flower or leaf that they never before noticed? When they zoomed out, did they observe something new as they examined their natural feature as part of the larger landscape?

Going a step further, this activity will help students think about situations in which they might want to zoom in and get up close to make their observations, and, in contrast, other situations in which getting too close will lead to missing the forest for the trees.

## **MATERIALS**

Writing materials

Journal entries from “Zoom In, Zoom Out” activity

## **PREPARATION**

Have students complete the “Zoom In, Zoom Out” nature journaling exercise.

## **PROCEDURES**

To begin, ask if students have heard the phrase “miss the forest for the trees.” Have students discuss or brainstorm meanings, or simply provide a definition, as is appropriate to the group. Explain that sometimes, by observing something in the wrong scale, people can miss important details.

Have students examine their journals and “Zoom In, Zoom Out” notes and drawings and write down the details that they noticed by zooming in and out. One way of organizing these details is to have students make a T-chart and putting zoom in details on one side and zoom out details on the other.

Using these notes, have students write several sentences to a paragraph about what they noticed zooming in and zooming out and why they think that they noticed so many new things. Depending on the age and writing proficiency, the length of the finished product will vary.

Instruct students to think about what sorts of things it might be helpful to examine on a small or large scale. For example, would looking at a brown bear up close tell us anything about how big the bear is in its environment or the way that it walks? Would looking at the bear from far away tell us anything about how its hair grows or whether it has toenails? When would students want to zoom in? When would they want to zoom out? When would it be a good idea to do both? What sorts of things could they learn by using each technique? What kinds of questions could they answer?

Based on the answers generated in step four, have students write a recommendation for other student scientists and observers. What are some general rules about when you might want to zoom in and out?

## **ENGLISH, LANGUAGE ARTS STANDARDS**

3rd Grade Writing: 1.1, 2.2

4th Grade Writing: 1.1, 1.2, 1.3, 2.3

5th Grade Writing: 1.2

# NATURE'S TREASURE MAP

## OVERVIEW

Students construct a map of treasures found along a trail as they hike, making quick sketches and creating place names for the sites of their sketches.

## OBJECTIVES

Students use their journals to document a nature walk, creating a map of their discoveries as they hike with thumbnail sketches to capture quick notes.

## PROCEDURE

Unlike other activities that are done in one spot, the treasure map is made along the trail while hiking. Give the Suggested Group Instructions. Move slowly along the trail, looking for interesting nature discoveries that students can map as they go. Include quick sketches and invent place names along the way. If you are making a loop hike, consider which side or corner of the page would be the most appropriate to start the map to leave room for the full loop on the page. Review the hike by standing in a circle and have students display their maps and discuss their observations.

## SUGGESTED GROUP INSTRUCTIONS

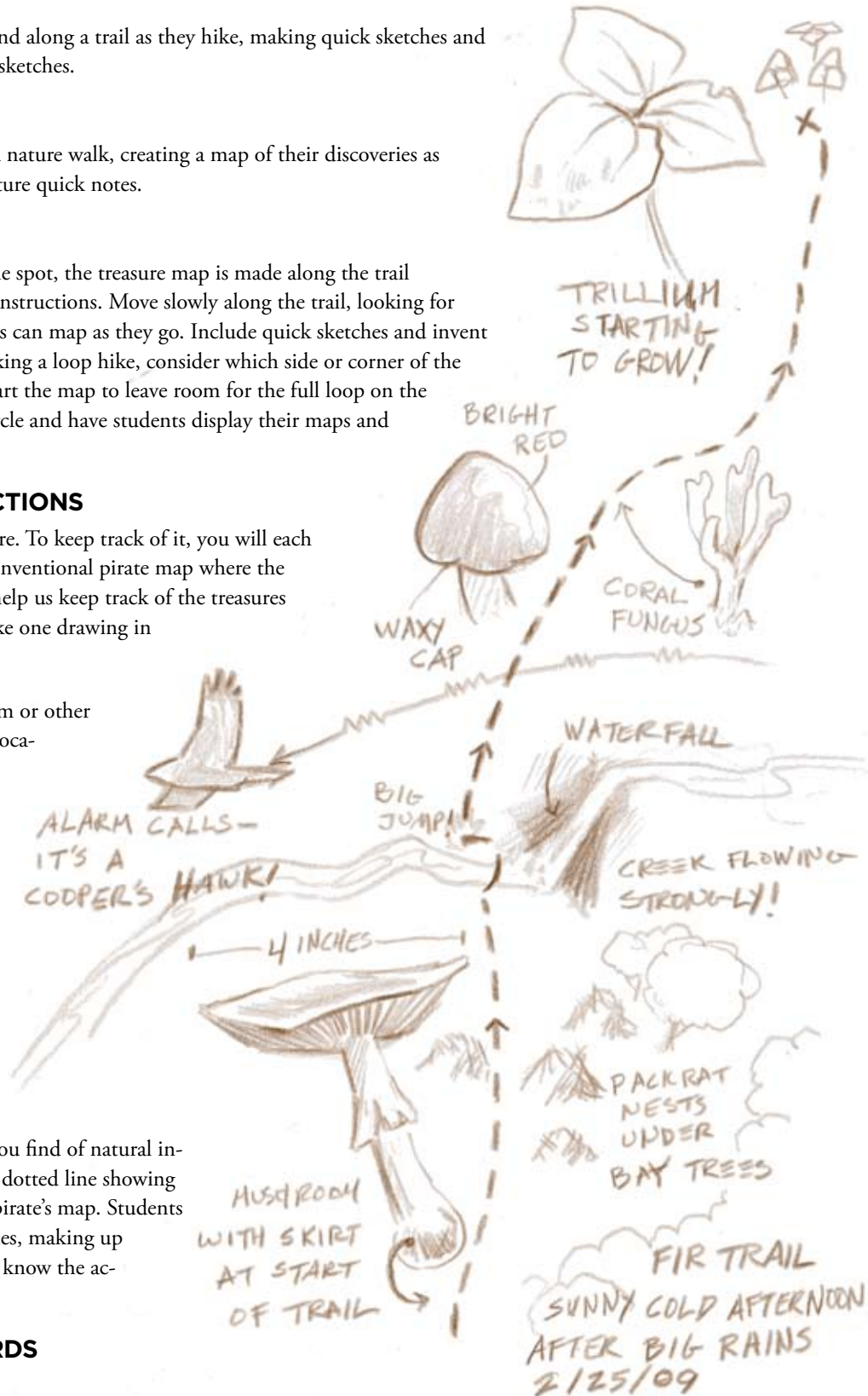
“We are going to search for hidden treasure. To keep track of it, you will each make your own treasure map. Unlike a conventional pirate map where the treasure is only at the end, this map will help us keep track of the treasures we find along the way. To get started, make one drawing in this corner of your journal page.”

Instruct students to draw a plant, landform or other feature that can be easily seen from your location. “Then start the dashed line that will show the hike route. It will grow as the hike progresses. The first treasure along our way is right ahead. Keep your eyes open and see if you can spot it.”

Stop at the next interesting natural feature you find or one that a student points out. Make a one-minute sketch and move on. Add quick sketches of hawks flying over and of their trajectories, landmarks, tracks, galls, opening flowers and whatever else you find of natural interest. Connect these discoveries with the dotted line showing the route. The end result will resemble a pirate's map. Students can be playful with species and place names, making up evocative fanciful ones where they do not know the accepted names.

## SCIENCE CONTENT STANDARDS

3rd Grade 5.e



# WRITING SHORT STORIES

## OBJECTIVES

Using the treasure map they have made in the “Nature’s Treasure Map” journaling activity, students will write a story based on that map and what they observed. For students who do not have a lot of experience in writing stories or have a hard time getting started, a little bit of scaffolding can help get the creative juices flowing!

## MATERIALS

Writing materials

Journal entries from “Nature’s Treasure Map” activity.

## PREPARATION

Have students complete the “Nature’s Treasure Map” journaling activity.

## PROCEDURES

Have students open their journals to the treasure map they created during the “Nature’s Treasure Map” activity

Ask them what they know about treasure maps and the people who might have them. Where did those people get their maps, and why are they going to follow them? What kind of treasure might be found using the maps? Can they think of stories they know where characters have a treasure map?

Tell them that they are going to be writing a story about their own treasure map. The characters in the story might be following the map, they might find the map, they might be guarding the map; the only rule is that the treasure map, and the path that it shows, should be in the story. What kind of treasure does it lead to? Who might have made it? Who might find it? What kinds of things might happen to them as they follow the path?

If you choose to use the student pages, have students fill out the character planning sheets as they decide who will be in their story. Remember to have them refer to their treasure map for ideas.

If desired, review the elements of a story: setting, plot (including conflict and resolution), characters, etc. Give students time to think or talk about what these elements might look like in their own treasure map story. Remind students that a good story has lots of sensory details (the five senses) to help describe the setting. What words could they use to describe what they sensed while they were making their map?

Let students write! Remind them to use their treasure map for ideas and details about the setting and the plot.

Share stories! Have students share their stories and the maps that go along with them in pairs or groups.

## EXTENSIONS:

Have students write non-fiction accounts of their treasure map’s path.

Have students present their stories orally to the class.

In pairs or small groups, students can use all of their maps to create a more detailed story.

## ENGLISH, LANGUAGE ARTS STANDARDS

2nd Grade Writing Strategies: 1.1, 1.2, Writing Applications (Genres and their Characteristics): 2.1, Listening and Speaking: 1.0, 1.8, 2.0, 2.1

3rd Grade Writing Applications (Genres and their Characteristics): 2.1 a, b, c; 2.2. Listening and Speaking: 2.1 a, b, c; 2.2; 2.3

4th Grade Writing Applications (Genres and their Characteristics): 2.1 a, b, c, d, Listening and Speaking: 2.1 a, b, c

5th Grade Writing Applications (Genres and their Characteristics): 2.1 a, b

6th Grade Writing Applications (Genres and their Characteristics): 2.1 a, b, c, Listening and Speaking: 2.1 a, b, c



# FIELD JOURNAL ACTIVITIES: INQUIRY INVESTIGATIONS

Field journal activities are also useful to focus students on patterns in the landscape. These activities take more focus and concentration but open students to broader patterns that they would not notice on their own.

Opening the World Through Nature Journaling  
**Inquiry Investigations—Field Journal Activity**

# MAPPING

## OVERVIEW

Students define and map vegetation zones.

## OBJECTIVES

By creating maps of plant distributions, students focus on patterns made by species growing in a variety of environmental conditions such as soil moisture, light, or disturbance. Students learn that plants are not randomly distributed but form patterns on the landscape in response to growing conditions.

## OPTIONAL EQUIPMENT

Aerial photos showing local vegetation patterns can be found on Google Maps.

## PROCEDURE

Find a small area with distinct boundaries between vegetation such as zonation in a meadow, marsh, or pond edge. Note how clear boundaries of vegetation patterns are visible from aerial photographs. Look across the landscape and correlate patterns you see on the photo with changes in vegetation with conditions found on the ground. Explain how those patterns show the differing growing conditions required by different species of plants.

Explain to the students that they will create a map of an area spanning several vegetation zones. Help them make a key to significant plants or vegetation zones. Clearly define the scale, e.g., 1 inch= 10 paces. Help them understand scale by drawing themselves on the map at the center and pacing off the distance to a nearby landmark. You can also use a pile of backpacks or other equipment and locate it on student maps to get them started, essentially a “you are here” sign. Set boundaries and a time limit as needed.

## EXTENSION

Once the map has been completed, choose two points and have the students draw a cross section of the route between them. See the following activity below. Discuss patterns in the landscape and how biotic and abiotic factors affect where species of plants occur. What do you think are the most important natural forces in the mapped area?

## SUGGESTED GROUP INSTRUCTIONS

“Plants are not randomly scattered across the landscape. We are going to map plants at the edge of this marsh to see what patterns of growth we can find. To do that, we must do several things. Let’s first look around and see if we can pick out four major plant types in this area.” Students point out plant types. “Now let’s make a simple key to those types of plants for use on our map.” Develop a key with the students. “Now we need a scale for our map. On this map one inch will represent ten steps” or other scale as appropriate.” Draw scale on page. “While we are working on this project, we can leave our backpacks here. Let’s start by putting ourselves on this map.” Mark backpack pile. Demonstrate how to map using the key. “If you find any interesting landmarks or evidence of animals, put them on the map. Any questions? You have twenty minutes to complete this map. Return to this spot when you hear my whistle.”

## EXTENSION

Use compasses, light meters, soil thermometers, or moisture gages to test student’s theories about forces that determine plant distributions. It is helpful to indicate which way is north. It is fun to explore and test the accuracy of ways of finding north without a compass and then check your guess.

## SCIENCE CONTENT STANDARDS

3rd Grade 3.b, 5.e

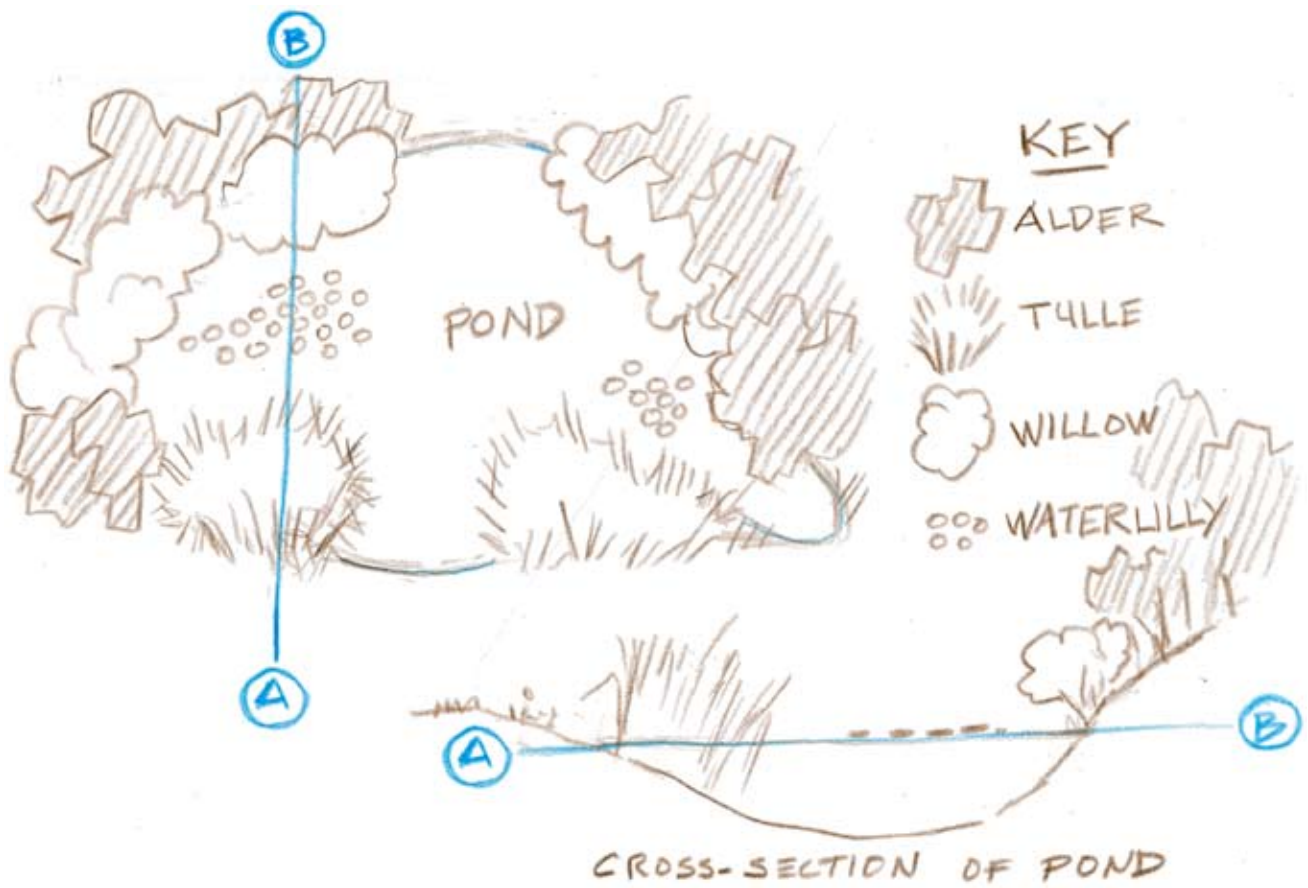
4th Grade 6.b5th Grade 6.a, 6.b, 6.c, 6.d, 6.e, 6.f, 6.g, 6.h

6th Grade 7.f

7th Grade 7.d



Opening the World Through Nature Journaling  
**Inquiry Investigations—Field Journal Activity**



# CROSS SECTION

## OVERVIEW

Students diagram a cross section of an area that shows a transition of plant types.

## OBJECTIVES

Students will create a transect highlighting vegetation changes. This study helps them understand how plant growth is affected by environmental conditions. Students map the change in plant types across an area that shows strong vertical zonation such as an intertidal area, shore to pond, across a riparian corridor, or other plant transitions, such as a ridge with north-south facing slope differences.

## PROCEDURE

Explain to the students that they will be creating a side view diagram of an area. Help them draw the ground profile across their paper showing changes in elevation. Instruct students to draw themselves standing on the ground to set the scale. You may also help them make a key to species (like the example on the previous page) before they begin. Walk slowly across the transect sketching the distribution of plants or animals. Discuss patterns in the landscape and why species occur and where they do, e.g. north/south slopes, or zonation near water due to soil moisture etc.

## SUGGESTED GROUP INSTRUCTIONS

“One way that scientists study an area is by making a transect. This means walking in a straight line through an area and noting changes in plants or animals. We are going to make a side view chart of a short walk. We are going to add symbols for the plants and animals we discover along the way. The trees and other symbols can be simple cartoons, but their locations must be accurate. We are going to hike straight over this ridge and a little way down the other side. I am going to draw the shape of the hill on my paper and I want you to copy the line I draw as closely as you can.” Draw hill profile. “Now we are going to make a simple key to a few of the most common trees and plants we will see. I will show you a few important plants and we will make symbols for them along the left side of our page. We may add a few more as we make our way over the hill. Lets start with this one over here. This is a Douglas-fir. Let’s look closely at its needles and cones so we can pick it out later. Here is an example of a simple symbol we can use for these trees on our cross section key. Now I need you to pick out another type of tree and come up with a symbol for it as well.” Students add plants to their key; more will probably be added as they make their way over the hill. “Now lets start our way up, adding trees and other plants to our diagram. The top of the hill is about two city blocks away so leave room on your chart for the changes near the top. I will tell you when we reach the halfway point.”

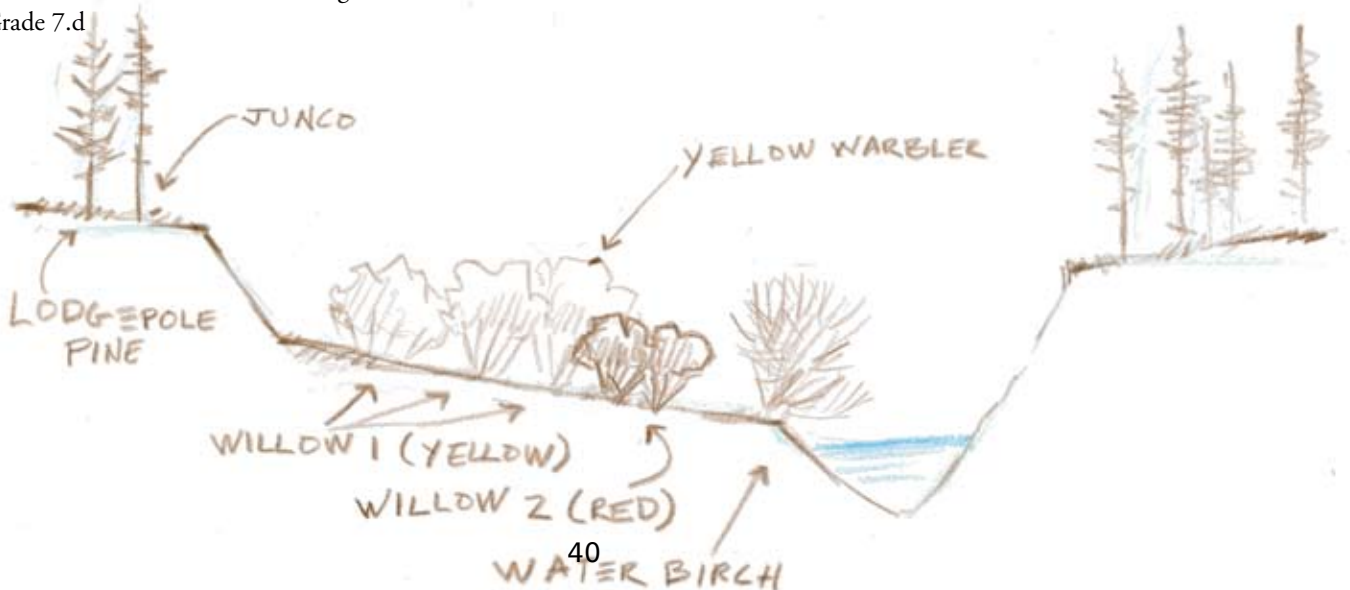
## SCIENCE CONTENT STANDARDS

3rd Grade 3.b 5.e

4th Grade 6.b

5th Grade 6.a, 6.b, 6.c, 6.d, 6.e, 6.f, 6.g, 6.h

7th Grade 7.d



# TIMED BEHAVIORAL OBSERVATIONS

## OVERVIEW

Students watch and sketch wild animal behavior, graphing the amount of time spent by the animals in several categories of behavior.

## OBJECTIVES

Students explore animal behavior first with a subjective approach that helps them see different types of behavior. Students then objectively quantify the time that the animals spend in each behavior and speculate about why they allocate their time in this way.

## PROCEDURE

If you find a stationary but active animal or group of animals, such as a colony of ground squirrels, Robins on a lawn, or flock of ducks, instruct students to pick one animal and quickly sketch what it is doing. Sketch the basic behaviors or postures of the animal. Help students divide the sketches into categories of behavior that you observe, e.g., feeding, alert/watching, walking to search for food, walking away from danger or disturbance, running, resting, courtship, etc.

Once students have entered those categories into their notebooks, begin the timed interval study. Give students a signal every twenty seconds for five to ten minutes depending on the group's attention span. Students will each watch one animal, and, at the signal, put a tally mark under the symbol or sketch that corresponds to the observed behavior at that instant. Students should be alert to add and record new behavioral categories as they are observed.

Note how we see different things if we are studying behavior qualitatively as when sketching, or quantitatively, as when counting behaviors. Both are important. Compare data between different students' observations. What do the animals spend most of their time doing? Why? Do you think the time allocation would change if we repeated the activity at different times of the day? How might this change if predators were more common in the area?

## SUGGESTED GROUP INSTRUCTIONS

"We are about to perform an animal behavior study. To get started we are going to make a series of sketches to represent the basic postures or behaviors that we see these animals engaged in. These can be simple cartoons but should capture the basics of the posture. Does it have its head up or down? Does it have a feeding position or characteristic postures for other activities? See if you can capture the major poses that these animals take. We are going to do this for ten minutes and then compare the behaviors we have each recorded. Are there any questions? All right, let's begin."

Now review and categorize the students' behavior observations. Help the students develop category groups. Possibilities include feeding, alert/watching, walking to search for food, walking away from danger or disturbance, running, resting, and courtship.

"Now stop your drawing and reassemble here. Let's compare the basic behaviors we have seen so far. We need to put the behaviors into categories and name them. What is one type of behavior we have seen?" Student suggests eating. "Good. Let's label one of our sketches eating. Pick your sketch that best represents eating. What is another?"

"We are now going to do a scientific study of how much time these animals spend doing these different behaviors. I am going to give you a signal at twenty-second intervals. At each, you will note which behavior this animal is performing at that instant and put a tally mark under your labeled sketch." If you are looking at more than one animal, you can assign different animals to different groups of students.

## SCIENCE CONTENT STANDARDS

3rd Grade 5.a, 5.b, 5.c, 5.d, 5.e

4th Grade 6.a, 6.e

5th Grade 6.b, 6.c, 6.d, 6.f, 6.g, 6.h

# KEEP YOUR QUESTIONS!

(AN ADD ON TO OTHER ACTIVITIES)

## OVERVIEW

Students record their questions while making careful observations.

## OBJECTIVES

Students learn to generate and record questions that occur to them as a result of their observations.

## PROCEDURE

Being able to ask good questions is an important science skill. Students are sometimes afraid of asking questions for fear that it may be seen as evidence that they have not studied hard enough or a reason for them to be made to work harder. This addition to other journaling activities encourages students to actively think about what they are seeing as they work.

## SUGGESTED GROUP INSTRUCTIONS

“Scientists will ask many more questions than they can answer. There are always things that we do not know. Every new discovery may generate a whole list of new questions and open the door to new discoveries. Before you start this next exercise, make a column on the side of your paper titled ‘I wonder what, where, when, why, and how.’ As you work, question what you are seeing and sketching, and list your questions. When you are done, review your list and put a star next to your most interesting question.”

## SCIENCE CONTENT STANDARDS

4th Grade 6.a

5th Grade 6.b



### My QUESTIONS

- Why is the color lighter around petal spots?
- Some flowers have yellow anthers/pollen others brown-orange-Why?
- Lilly visited by hummingbird - any other pollinators?

Opening the World Through Nature Journaling  
**Inquiry Investigations—Field Journal Activity**





# FIELD JOURNAL ACTIVITIES: TEACHABLE MOMENTS

You never know when critters will show up. Mammals hide and birds may fly away. If you are lucky and the animals ignore you and stay in the open, or you witness an interesting interaction between species, take advantage of the situation. Get out your journal and start taking notes. It helps students to focus if these note taking activities are structured. From these field observations, the experience can be written up or further illustrated later.

# WILDLIFE GESTURE SKETCHING

## OVERVIEW

Students make quick sketches of animals on the move.

## OBJECTIVES

Students engage in careful observation and develop note-taking skills without pressure to make a piece of art. Fast sketching helps students look more accurately and deeply.

## PROCEDURE

If you find observable wildlife on a hike, take advantage of the moment with quick sketching. Encourage the students to make lots of quick sketches instead of one finished drawing.

## SUGGESTED GROUP INSTRUCTIONS

“Look, there is a deer! Get out your journals quickly. While we can still see the deer, make some fast sketches of its shape.” As students start to sketch “ Don’t worry about details or about finishing one drawing. If it moves to another position, just start a new sketch on the same page. It is now looking at us. Make a quick sketch of the head from this angle. Try moving the pencil quickly, loosely, and lightly to help get down the basic shape. Do not erase what you have drawn but go over the lines, accenting the ones you like. You do not have to finish these drawings. They are only quick impressions of what you have seen. Try working a little larger. Make the drawing as big as your hand, not just little postage stamp drawings.”





# NATURE COMIC BOOK

## OVERVIEW

Students record an observed natural event by constructing sequential comic book–like entries.

## OBJECTIVES

Students record sequences of animal behaviors incorporating the familiar graphic style of a comic book. Making a comic is playful and creative. By integrating the comic into recording a real nature event, students push themselves further to record their data.

## PROCEDURE

If you witness interesting animal activity or behavior, make a serial comic or storyboard of what you witnessed. Gesture sketches (see activity above) make an excellent reference. Lay out several panels and fill them in, showing the flow of the action complete with sound effects. You can accurately document what you saw and still have a lot of creative freedom in creating the comic. Students can add sound effects, interesting points of view or other touches.

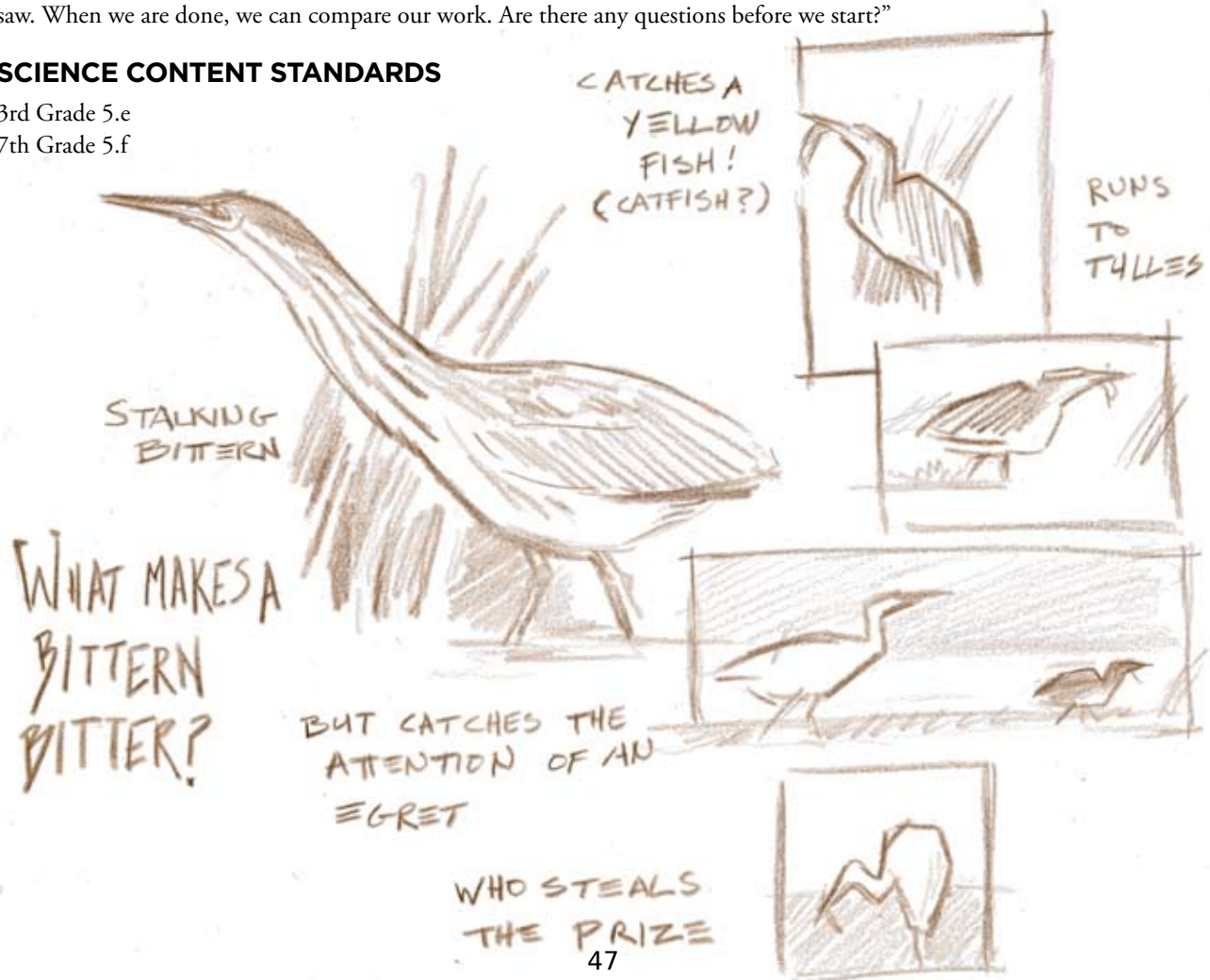
## SUGGESTED GROUP INSTRUCTIONS

“Wow, we were so lucky to see that hawk catch a snake! Quickly now before we start to forget the details, let’s review what we saw, what happened in what order and what details can you remember?” Students respond. “That is quite a story! We are now going to document this event in our journals by making a true-life nature comic. In your journal, make a series of panels that show the full sequence of events with as many details as you can include. You can have fun with interesting angles (like the snake’s or hawk’s eye view), long or tall panels, sound effects, and action symbols as in other comics, but we must accurately represent what we saw. There are a lot of ways to do it, so let’s take the next fifteen minutes while we still remember what we saw. When we are done, we can compare our work. Are there any questions before we start?”

## SCIENCE CONTENT STANDARDS

3rd Grade 5.e

7th Grade 5.f



# RESPONDING TO POETRY

## OBJECTIVES

The objective of this lesson is for students to emotionally connect to poetry using both images and words.

## BACKGROUND

Just as many children, after a certain age, are no longer comfortable drawing because they aren't "good artists," others can find themselves drifting from literature, thinking that they are "bad readers" or "bad writers." As their educations progress, the emphasis may be placed on literary interpretation, and the power of an emotional response to poetry or literature can become lost in the shuffle. Ironically, it's this emotional connection that can lead to the most insightful and vibrant interpretation!

This exercise aims to help students respond to nature poetry as they have been responding to nature: through close observation and with wonder. By incorporating the visual and physical aspects of nature sketching, students can approach and engage with poetry in a way that is physical, mental, and visual.

## MATERIALS

Writing materials

Selected poetry for reading to students

Copies of poems for students (optional)

## PREPARATION

Ideally, this activity will take place in a relatively quiet outdoor space. If such a place is possible, scout it out in advance and be aware of its ability to hold the group comfortably. If an outdoor location is not available, a quiet indoor location with minimal distractions (and an open window!) can substitute.

Choose a poem that reflects, to some extent, on the natural world. If this can be aligned with your particular outdoor setting in any way, that is ideal. Poems that mix visual descriptions with feelings and emotions are best. Be aware of the linguistic abilities of the group; some challenging diction and vocabulary can be a positive, but keep in mind that in most cases, students won't be looking at a copy of the text themselves. The emphasis on this activity is hearing the poetry and responding to it, rather than reading or analysis, and thus the grammar/diction/vocabulary needs to be almost immediately accessible. Possibilities include: Mary Oliver, Emily Dickenson and Walt Whitman.

## PROCEDURES

Bring the group to the previously selected location for this activity. Students should have their nature journals and any required drawing implements. Have them settle into individual spaces and quiet down.

Tell students that they will be listening to a poem about the natural world around them. If they are in an outdoor location, prior to reading the selected poem, have them first take a few moments to notice and observe the world around them. Tell them to record in their journal, using pictures, words, or a combination of both, anything they see that catches their interest, whether it's a small plant nearby or an insect or a stream. Encourage students to use all five senses and see what inspires them.

Tell students that for the first time they hear the poem, they should just listen. Have students close their journals and put their pens down. Recommending that they close their eyes can also be helpful!

Read the poem, clearly and slowly. (If helpful, read it through as many times as needed!) Let students remain seated, eyes closed. Give pause after each reading.

Have students pick up their journals again. Tell them that this time, they will be sketching the images or thoughts that come into their minds when they hear this poem.

Opening the World Through Nature Journaling  
**Focused Observation—Language Arts Extension**

Read the poem through once more.

Give students ample time to journal their responses.

After this is completed, have students share, either as partners, small groups, or as a large group, some of what they heard in the poem and their responses to it.

**POSSIBLE GUIDED GROUP DISCUSSION POINTS:**

What did you picture in your mind as you heard this poem? Was it images or colors? Did you picture anything at all, or did you think of other sense perceptions, like smells or sounds or feelings?

What sounds did you hear in the poem's words? Did they remind you of anything?

What was your favorite word in the poem? Why did you like it so much?

Did this poem remind you of anything?

Do you see anything around you that makes you think of this poem?

What color would this poem be if you drew a picture of it? How come?

How did this poem make you feel?

Do you wonder anything about this poem or the poet?

**ENGLISH, LANGUAGE ARTS STANDARDS**

3rd Grade Literary Response and Analysis: 3.1, 3.5

4th Grade Literary Response and Analysis: 3.5, Writing: 2.2

5th Grade Literary Response and Analysis: 3.1, 3.4, 3.7, Writing: 2.2



# YOU'RE A POET— AND YOU SHOULD KNOW IT!

## OBJECTIVES

Student will use guided writing techniques to create poetry of their own that is inspired by the observations that they have been making in their journal.

## MATERIALS

Writing materials  
Journal entries

## PREPARATION

Gather examples of poetry, either from other student or adult poets. These examples can either be printed on regular sheets of paper, on larger poster boards, or written on the board at the front of the classroom. Make sure students begin the activity with ample lined paper or room in their journal in which to write.

## PROCEDURES

Ask students what they know about poetry. Explain that poetry is simply arranging words and sentences in a way that helps the reader feel or see what the poet is feeling or seeing.

Tell students that they are going to write some poetry of their own. Remind them that it does not matter if they have never done this before!

Then, introduce the poetry form or forms. Students will respond to some forms and not to others. If one does not work for you, try the next. If the counting and structure of Haiku is a turnoff for a student, perhaps they will respond to five senses poetry or nature rap. Once they have been exposed to options, let them go with what works best for that individual. Maybe some of them would like to write a song and sing it to the class. You never know, Why not be surprised?

## HAIKU

Haiku is a traditional form of Japanese nature poetry that has been adapted to fit the English language, and it is one of the best forms of poetry to use with children. Unlike many other forms of poetry that educators often use, like acrostics, haiku have the advantage of immediately looking and feeling like real, grown-up poems, no matter how infrequently a student may have done creative writing.

Haiku in English follow a very simple format based on counting syllables:

Line one: 5 syllables

Line two: 7 syllables

Line three: 5 syllables

As in Japanese haiku, English haiku often center around nature observation, frequently mentioning the season or weather, local plants and animals, rivers and streams, etc. And all a student has to do to create her own haiku is count her syllables!

Counting syllables can be tricky, however: we recommend teaching children a very physical method to keep track of their syllables. Instruct students to hold one hand flat, just underneath their chin, but without touching it. As they speak, every time that their chins hit their hands counts as one syllable. Thus, the word “nature” has two syllables; “hummingbird” has three; “girl” and “boy,” even though we often draw them out as we say them, only have one each.

In order to help students get the hang of counting syllables, practice counting for various familiar words. Creating a large-group haiku to begin with can also help to illustrate proper counting technique.

Some examples:

In the morning fog  
I watch a deer cross the road.  
I see her white tail.

Acorns fall from oaks.  
Dry grass shakes in the wind.  
Winter is coming.

If I sit outside  
Nature sneaks around me  
Until I am wild.

## **FIVE SENSES POETRY**

Five senses poetry uses students observations to create short, non-rhyming poems about a specific moment or place.

For children just beginning to write poetry (or just beginning to write at all!), the most basic form of five senses poetry is to record what they perceive with each sense, using the first person pronoun to begin each line:

By the Pond

I see the water shining  
I hear the geese honking  
I feel the breeze on my cheeks  
I taste a green piece of grass  
I smell the mud by my feet

Kids can begin to write this form of poetry by writing the start of each line in their journal, or on a piece of paper, and then taking it out to the field to observe.

More advanced students can write one line per sense, but do not need to stick to the “I feel, I smell, I taste” format that younger students may need. For example:

By the Pond

The water is shining, and I can see fish coming up to the top.  
The geese behind me honk back and forth.  
The cool, dry breeze touches my cheek.  
I chew a piece of grass, and it tastes sweet.  
When I move my feet, the mud smells like plants and water.

As with haiku, this type of poetry does not require rhyming, nor does it require more than structuring observations that students are already learning to make. Encourage students, as they write five senses poems, to consider which details are the most essential to describing a scene. They may see many things, for example, but which would they most like to share with a friend who is not with them? What would they most like to remember? As with journal entries, these types of poems can be praised for their attention to detail and their success within the form—NOT simply for being “good” writing.

## **SIMPLE RHYMING POETRY**

Many students are familiar with rhyming poetry, and as they become more comfortable writing their own poems, it can be fun to encourage them to rhyme.

Rhyming poems follow a rhyming pattern. Here are some of the more common forms:

- (A) The einsy-weensy spider
- (B) Went up the water spout.
- (C) Down came the rain
- (B) And washed the spider out!

- (A) Twinkle, twinkle little star
- (A) How I wonder what you are!
- (B) Up above the world so high
- (B) Like a diamond in the sky.

As you can see, many familiar children's songs can be great places to begin when helping students create rhyming poems. Not only are they familiar (and great examples of rhymes), but the rhythm of these familiar lines is so ingrained for most students that if they take songs as their models, they will approximate regular line length without even realizing it. This will help poetry sound better—and be easier for the student to remember when he's done!

Rhyming poetry can be more challenging than other types, as students not only need to think about what they'd like to describe, but they must find words that rhyme to do so. Looking for rhymes can be an engaging game for some students, but for others, it will simply increase frustration and result in an abandoned task. Thus, in order to help students feel successful in writing this type of poetry, it's a good idea to create a word bank of rhyming words and have it available while students are composing their own poems.

If you are using familiar songs to help model rhyming poetry, celebrate success by singing the poems that students have created!

## **NATURE RAP**

If students are interested in rap forms they may be more motivated to create their own. One way to start is with a short observational phrase. "Frogs are jumping at my feet." Then pick focus on a word or words in the phrase that you need to want to connect with rhyme. These will often be words at the end or the rhyme. Think "what rhymes with feet," and go from there. Rhyming couplets do not have to be perfect rhymes such as flower/power. "Slant" rhymes are words that almost rhyme and open up more possibilities and creativity in the rap such as flower and devour. Students can play with different beats for their rap, basing the beat off a familiar song or inventing one of their own. Encourage student to try to use multi-syllable rhymes where more than one syllable in a phrase rhymes with those in another line. For example: sky bird/my word. The rap does not need to rhyme or even make sense all the time. If you stay with a beat and know where you are going, it often works out. Have fun with it.

## **EXTENSIONS:**

Have students share their poetry with another class or group of students

Encourage students to memorize their poetry and recite it without the help of their journals

Read published nature poetry and use these as models for students to create their own, original works. Encourage students to memorize classic poetry as well.

## **ENGLISH, LANGUAGE ARTS STANDARDS**

1st Grade Writing Applications: 2.2; Speaking Applications: 2.1 (recite poetry)

2nd Grade Literary Response and Analysis: 3.4

3rd Grade Writing Applications: 2.2; Listening and Speaking: 1.9







