



4.

Naturalist Notebooks

Description: Students learn how to keep notes on their observations and activities in the bosque.

Objective: Students will develop essential observation and recording skills required of naturalists, scientists, or other nature appreciators.

Materials: naturalist activity pages
pencils
hard surface for writing, such as cardboard, notebook, or a clipboard
thermometer
compass
tape measure
field guides for reference back in the classroom

Background: In this chapter we have provided three examples of focused journaling activities. These activities introduce students to the process of collecting field information and teach them some basic journaling skills. All three activities follow the same format—introduction, general observations and site description, directed observation and/or data collection, and synthesis. This format encourages students to ask questions and continue their learning back in the classroom with field guides and other resources. Also see Activity #44, Naturalist Notebooks: Fire, in Chapter 6.

The **Rio Grande** activity focuses on the river and provides guidance on drawing the landscape. The **Cottonwood** activity involves basic data collection (students measure the diameter of a tree) and encourages students to focus in on one particular part of the tree. The **Birds of the Bosque** activity will help students to observe not just birds but the evidence that birds leave behind.

These journaling activities can stand alone, be used as an introduction to other activities in the guide, or be the beginning of a long-term journaling project. To extend this activity we have included “Guidelines for Keeping a Field Journal” after the following focused journaling pages. We hope this will inspire both you and your students to explore a number of other topics over time.

Extensions: Other journaling topics might include: exotic/invasive species, human impact on the bosque, mammals, decomposers, plants, arthropods, weather, leaves, ecosystems, animal evidence. Also, students could visit the same site several times over the course of the year and record the changes over time.

4. Naturalist Notebooks



Grades: 5–12

Time: 30 minutes to one hour

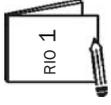
Subjects: science, language arts, visual arts

Terms: cohort, keystone species, diameter at breast height (DBH)



If you were to visit this same area in three months, do you think it will have changed? Why?

What are some questions you have about the river? What else would you like to know about it? Write your questions here.



The Rio Grande

The Rio Grande flows 1,885 miles (3,016 km) from southern Colorado to the Gulf of Mexico, through three states in the U.S. and four states in Mexico. It sustains many plants and animals and is used by people for agriculture, hydropower, manufacturing, recreational, and domestic uses. Today you will make some observations about the river as it appears in your area.

Name _____

Date and time _____

Location description _____

Weather (temperature, wind, cloud cover, precipitation in the last 24 hours) _____

Find a comfortable spot and spend at least five minutes observing the river. Use words to record your observations.

I see _____

I hear _____

I smell _____

I feel _____



RIO 2

- Draw a shape map of the landscape in the box above.
- Begin by drawing a line to represent the top of the trees, or mountains, or whatever meets the sky.
- Next, drop down to the bank on the other side of the river and sketch in where the water meets the land.
- Now sketch in the near bank on your side of the river.
- Using simple images, draw in the trees, seedlings, and sand bars or whatever you see in front of you.
- Label what you draw.

How high do you think the river needs to rise to flood over the banks? How high to flood where you are sitting?



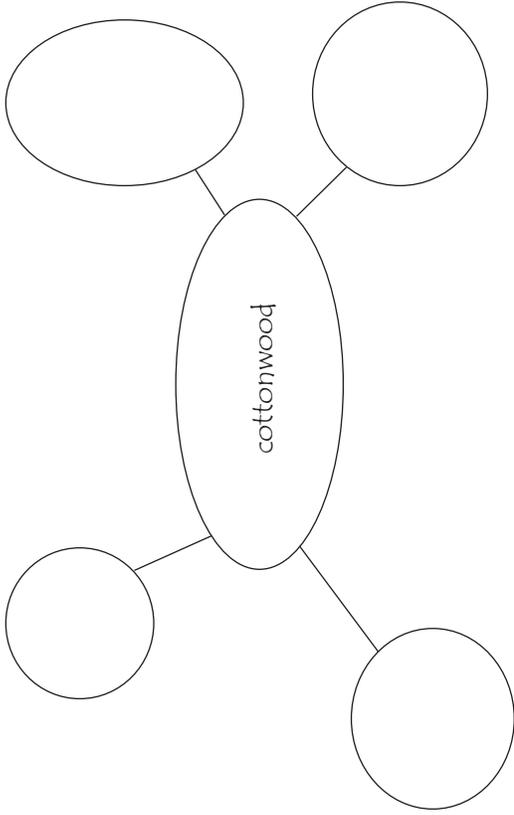
RIO 3

If the river is not bank-full, take a walk along the river bed to see the exposed gravel, sand bars, clay and/or silt (collectively called sediment!). Add these features to your landscape drawing. Make sure you also indicate the direction the river is flowing.

The size of particles along a stream can tell you about the flow of the river. Faster water can carry larger items including gravel; the water must be very still to create clay deposits. Describe the sediment in this area. Based on the size of particles you observe, does the river run relatively fast or relatively slow along your stretch?



As a keystone species, the Rio Grande cottonwood is connected to many elements of the bosque. Using the web below as a starting point, fill in the elements that are connected. You may add more elements or connections.



What are some questions you have about this tree? Anything you might want to know more about?

Rio Grande Cottonwood



The Rio Grande cottonwood is a keystone species in the bosque. The word "keystone" literally refers to the piece of a stone arch that locks the other pieces in place. Without a keystone, the arch would collapse. Without the cottonwoods, the bosque would cease to exist as we know it. Many animals use it for shelter or food. The health of the cottonwood forest is also a good indicator of the overall health of the bosque. Today you will take a close-up look at a cottonwood.

Name _____

Date and time _____

Location description _____

Weather _____

(temperature, wind, cloud cover, precipitation in the last 24 hours)



Find a cottonwood in the bosque. You will recognize it by its large size and triangular-shaped quaking leaves. Look at it very carefully for at least a few minutes. Make a contour drawing by drawing the whole tree without looking at your paper and without lifting your pencil from the paper.



Using words, make some observations about the tree. What does it look like? Feel like? Sound like? Does it remind you of anything? What other organisms do you see on or near the tree?

A cohort is a group of trees that are all the same age—they germinate during the same event—but they may not be the same size. Some trees may grow bigger because they have more space, get more nutrients, or have a genetic tendency to grow faster.

Wrapping your hands or arms (or one or more classmates' arms depending on the size of the tree) around the trunk, compare the different sizes of trees near your tree. This called "diamater at breast height," a way to compare sizes of trees. Do you think they are part of the same cohort?

Tree #	Size
1	_____
2	_____
3	_____
4	_____
5	_____
6	_____
7	_____

Pick one part of the tree to examine closely. It could be a leaf, a branch, or anything else that catches your interest. Sketch it or describe it with words.





Reflection

Based on your observations, why are the birds here? Give three possible reasons.

Empty rounded rectangular box for reflection.

Write a riddle about one of the birds you have seen today. See if your friends and classmates can figure out from the riddle what bird you are describing. In writing your riddle think about the bird's behavior, where it lives, what it eats—do not just write a description.

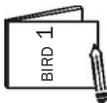
Empty rounded rectangular box for riddle writing.

Now that you have observed the birds and their behavior, what else do you want to know? Write down two questions you would like answered.

Empty rounded rectangular box for questions.

Birds of the Bosque

There are many different species of birds that live in the bosque. Some of the species are year-round residents; others spend only the summer or winter here. Still others only pass through as they migrate in the spring and fall. The goals today are to find as many species of birds as you can and to discover what they are doing and why they might be here. Remember, some of the birds are very secretive. You have the best chance of seeing birds if you are quiet.



Name

Date and time

Location description

Weather

(temperature, wind, cloud cover, precipitation in last 24 hours)

Before you begin, answer the following questions:

1. What birds do you expect to see?
2. What do you think the birds will be doing?

Large rounded rectangular box for field notes and questions.



We are going to examine some of the different habitats in the bosque. Ornithologists (scientists who study birds) spend many hours sitting quietly, watching and listening to birds. Go to each area and sit quietly for at least five minutes. Look and listen not just for the birds themselves but also for evidence of the birds.

Along the River

In the Trees

Draw in detail one bird that you see in the area.

Describe what the bird is doing.

Draw in detail one bird that you see in the area.

Describe what the bird is doing.

Where do you hear the birds in relation to you? Put marks in the box below to represent the birds. (You might want to use different marks to represent whether the birds are up high or at your level.)

you

Evidence of Birds: Scientists often look for bird evidence as much as for birds themselves. Write or draw the evidence you have found:

- Food
- nests
- feather
- droppings
- tracks
- calls
- holes



Field Journal Guidelines



Naturalists keep field journals to record their observations and track their thinking about experiences in the outdoors. There are many ways to keep a field journal; methods vary depending on one's purposes. Here is one set of guidelines for keeping field notes in a "class" environment where notes will be turned in for grading and review.

Your assignment is to keep a field journal throughout our project. You are expected to maintain the index and to take notes in the field, during labs, on pertinent conversations, in class, and any other time you are working with things related to your field experience. The notes may be important to yourself or others many years down the line. You are expected to write your notes in the field or during the actual lab. Although you should try to be neat, field notes should not be perfect but rather reflect the conditions under which they were written.

Maintaining the Index

To help find information quickly in the future, it is important to dedicate the first few pages of your journal to indexing. (You may want to save the first page for a title page.) Make sure the journal has page numbers; if not, number the pages in the upper outside corner of each page. Each time you participate in an activity related to your study, make an entry in the index, which includes:

- page number(s) where you write your comments (drawings, etc.)
- your name or initials
- the date
- location (if applicable)
- a short description of what you were doing

Example: Page 32 mcs 9/17/99 Santa Ana BEMP Site, Bernalillo, NM, BEMP monthly collection

Taking Field Notes

Every time you go to the field, write notes. These notes should include:

- the date and day of the week
- your name and the names of your companions
- a brief description of the weather including the temperature (if you have no thermometer, use words like "chilly," "mild" or "hot"), cloud cover, any precipitation (rain, snow, hail, etc.), amount of wind
- a brief description of the location including the name of where you are and, if reasonable, travel directions so someone can find the site again
- notes about observations you have made (wildlife sighted, changes to the site, phenology of plants—such as cottonwood leaves are turning yellow on 25% of trees—etc.)
- notes about your work; explain what you are doing and why



You may also want to include:

- a sketch of something you have observed that you found interesting
- at least one question that you have thought of relating to your work in the bosque or relating to your understanding of the program
- natural history samples such as flat things like plant leaves or seeds which you tape into your notebook to aid with identification
- a map of where you are and what you are seeing

Taking Lab Notes

When you are no longer in the field, but working with materials collected in the field, such as water samples, or other kinds of data, this is considered lab work. Write notes while doing lab work to help:

- record pertinent data
- keep track of questions you have that you need to find answers to
- document any unusual observations
- record what day you are doing the work, what work you are doing, and who is working with you.
- include printouts of tables and graphs you generate from your data

Other Things to Include

Remember that other people will examine your field journal. Naturalists' field journals can be considered legal documents and have occasionally been used in legal cases. We hope this inspires you to do a good job of keeping notes, but remember we are all human and nobody keeps perfect field notes. Do the best job you can when you are in the field or the lab, and *do not wait to make your notebook entries* as a homework assignment to catch up on later—do them in the field or the lab.

Remember, your field journal is a written record. It documents the effort you put into a course of study and observation. From a legal perspective: if it is not recorded, it wasn't done. From a practical perspective: if you don't record something, you may forget about it later.

Be Sure to Include

all field notes with data
lab notes to document
samples worked on,
dates, problems, data,
etc.
pertinent information
from phone calls or
conversations related to
your field work
drawings and diagrams
to help illustrate your
observations
unlisted phone numbers

Do NOT Include

unprofessional remarks
about other people
any other inappropriate
information
class notes

Optional

thoughts and personal
insights on readings,
class discussions,
conversations with
others
notes on related lectures
and programs
newspaper clippings and
other information that
relates to your field work
natural history notes, plant
pieces, drawings, etc.