

# FIELD INVESTIGATIONS AND ACTIVITIES

**Science learning experiences occur in the classroom, in the laboratory and in the field. In these experiences, students discover facts, concepts and laws of science for themselves, much as scientists do in their professional lives. Classroom experiences require hands-on-materials and procedures in order for students to experience various facets of the natural world. Experiences that extend from the classroom into the field allow students to explore, observe, and investigate things in the natural world that cannot be brought into the classroom learning environment.**

**Laboratory-based experiences enable students to inquire, explore, and observe things in the natural world that are brought into the classroom to facilitate student investigations. The Texas Essential Knowledge and Skills for Science require teachers at all grade levels to be provided with a wide range of materials and instruments for facilitating student investigations. They also require the students, at every grade level and in every high school course, have field experience and do field work.**

**Field work, field trips or field investigations provide first hand experience to a well-designed inquiry-based science program for students. Direct observations in a field setting provide a more stimulating and rewarding experience for the students and the teacher. Safety guidelines must be maintained to ensure a productive experience for all participants.**

## **What is a Field Investigation?**

**The Texas Essential Knowledge and Skills for Science require students in Kindergarten-Grade 2 to conduct science investigations in the classroom and in the field. At the grade levels of Kindergarten-Grade 2, “the field” means science investigations of natural phenomenon that occur on the school grounds or in informal science settings such as arboretums, zoos, wildlife habitats, parks, and museums.**

**Students in Grades 3-8 are to conduct science investigations in the field and in a laboratory. At these grade levels, “the field” means science investigations of natural phenomenon that occur on the school grounds or in informal science settings such as arboretums, zoos, wildlife habitats, parks and museums.**

*Taken from Texas Safety Standards*

*K-12*

*January, 2000*

# A CHECKLIST FOR FIELD INVESTIGATIONS

## (✓) General Preparations

- Has the representative from the site granted permission?
- Is the site accessible for physically challenged students?
- Has a date been established?
- Has an alternate date been established?
- Have sponsors been selected?
- Has the sponsor/student ratio been established?
- Have students been checked for eligibility and discipline record?
- Are there other requirements that the site requests?
- Are admission fees required?
- Are there bathrooms and an area to eat meals at the site?
- Is it necessary for students to bring their own food?
- Will copies of the Permission Forms and a student list be left with an administrator?
- Will the Emergency Medical Forms be taken with the teacher?
- Is there a portable phone for emergency use?
- Are emergency procedures in place for handling an injured student or sponsor?
- Has the school district approval been received?
- Is it necessary to have a meeting with parents?

## (✓) Purpose of the Investigation

- Have objectives (TEKS) for the investigation been determined?
- Does the field investigation integrate with other subjects?
- Do students have sufficient background knowledge to be successful?
- Are activities planned so students will be actively engaged in learning?
- If students miss other classes, have their teachers been notified?

## (✓) Transportation Requirements

- Will school district or public transportation be used?
- Is it necessary to raise money to pay for transportation?
- Has transportation information been given to parents?
- Are transportation permission field trip forms required by the school district?
- Is additional insurance required by the school district for field trips?
- Have arrangements been made if a vehicle breaks down?

## (✓) Student Preparations

- Have students been notified of the type of clothing and shoes to wear?
- Has an information letter been sent to parents?
- Have medical forms, parental consent forms, etc. been given to students?
- Are deadlines for returning forms been set?
- Have student behavior expectations been established?

**Please ensure that you check the weather forecast for the day. Salado and Panther Springs Creeks are both subject to flash flooding.**

## **OUTDOOR SAFETY – – FIELD STUDIES**

### **Success Through Good Planning and Sound Procedures**

Taking students on field studies can be a valuable, positive addition to the science program, especially for younger children and/or in an environmental curriculum. An effective field study is most valuable when educational objectives are clearly identified and the activities are constructed or designed to achieve those objectives. When the study is well planned and organized, the possibility of accidents occurring is greatly reduced. Thorough preparation can ensure safety for all participants.

#### **FIELD STUDIES ARE VALUABLE EDUCATIONAL EXPERIENCES WHEN TEACHERS . . .**

- keep student safety in mind.
- establish and enforce rules for safe student conduct.
- plan field studies by visiting the site, establishing emergency procedures, and obtaining parental permission.
- ensure that specimen collections are legal and serve valid educational purposes.

### **A. Preparation**

#### **1. Permissions and Notifications**

- Obtain the principal's approval and inform other staff of the date and destination of the trip.
- Obtain parents' permission for their children to participate in studies off the school grounds. Have students take a written description of the trip home to their parents. Include in the information the types of clothing to be worn, safety precautions to be taken, and a parental permission form.
- On the day of the field study, post on the classroom/laboratory door or other conspicuous location a sign indicating the destination of the class trip and departure and return times.

#### **2. Participation**

- Determine the appropriateness of the field study for all students based on any physical disabilities, allergies, or other conditions that could impair or limit their participation.
- Compile a list of all students participating in the trip and provide a copy to the school office.

#### **3. Arrangements**

- Make appropriate arrangements with the special education staff, school nurse, and/or parents for students with special needs.
- Arrange for transportation to the site using transportation approved by the local school system.
- When planning a trip to a facility such as a factory or laboratory, arrange for an experienced facility representative to conduct the tour. The visit should be well supervised.
- Arrange for parents or other responsible adults to assist with supervision as appropriate.

#### **4. Rules**

- a. Follow the rules your school or school system has established relating to trips outside the school. Make sure students know whether or not regular school rules apply during the field study off campus. Inform students of any specific school rules that apply to field trips.
- b. Before each trip, establish rules for safe student conduct and explain the rules to all participating students and adult supervisors.

#### **5. Site Survey**

Visit the site prior to the trip and conduct a survey of the area. The survey should include identification of any of the following conditions or potential dangers that need to be addressed in planning the trip:

- a. Conditions that could cause students to fall, such as steep terrain, slippery or unstable rocks, or animal burrows or holes
- b. Unstable objects overhead that may fall
- c. Foot bridges or other crossings which may collapse under student weight
- d. Deep water or currents strong enough to sweep students off balance
- e. Animals capable of injuring students, including poisonous or venomous animals, ticks, or mites
- f. Potentially allergic substances or poisonous plants
- g. Vehicle traffic
- h. Seasonal hunting areas
- i. Electrical hazards
- j. Threatened and endangered species
- k. Areas that have been sprayed with herbicides or pesticides

#### **6. Precautions and Emergencies**

Before the field study, some precautionary measures should be taken to ensure a safe trip. These measures include the following:

- a. Based on the pre-trip survey, map the safest passage through the area.
- b. Instruct the students in:
  - safe methods of movement through the study area, with special caution given to the transport of equipment
  - recognition and avoidance of poisonous plants and animals.
  - the need for and use of appropriate shoes and other clothing.
  - safe methods for working on or near bodies of water (including the appropriate use of the buddy system and life jackets). *Note:* Basic water safety rules may be found in first-aid, Scouting, and Red Cross publications.
  - the proper use of equipment, including the use of chemical splash safety goggles (or other eye protective devices).
  - proper use and handling of chemicals used for water and soil testing.

c. Prepare for emergencies in the following ways:

- Determine a method for contacting the school office in the case of an emergency.
- Be prepared to follow the school or school system's emergency procedures in the event of an accident.
- Maintain up-to-date medical information and emergency telephone numbers for each student.
- Be aware of any medications students are currently taking and determine if the medications will need to be taken while on the trip.
- Be sure that first-aid kits are readily available and check the kits to make sure they contain the essential items.
- Identify procedures for the immediate, on-site treatment for insect or animal bites, accidental ingestion of poisonous plant matter, or other medical emergencies until professional medical treatment is obtained.
- Be prepared to provide appropriate means for transporting an injured student to receive treatment.

## **B. At the Site**

1. Monitor students to ensure that they are adhering to the precautions and rules developed in planning the trip.

2. Specific considerations for safety at the site include the following:

### a. Goggles

(1) Require students to wear chemical splash safety goggles whenever they use laboratory reagents or liquids. Students should wear impact goggles when using sharp objects such as chipping hammers or picks. All persons in close proximity to such activities must also wear goggles.

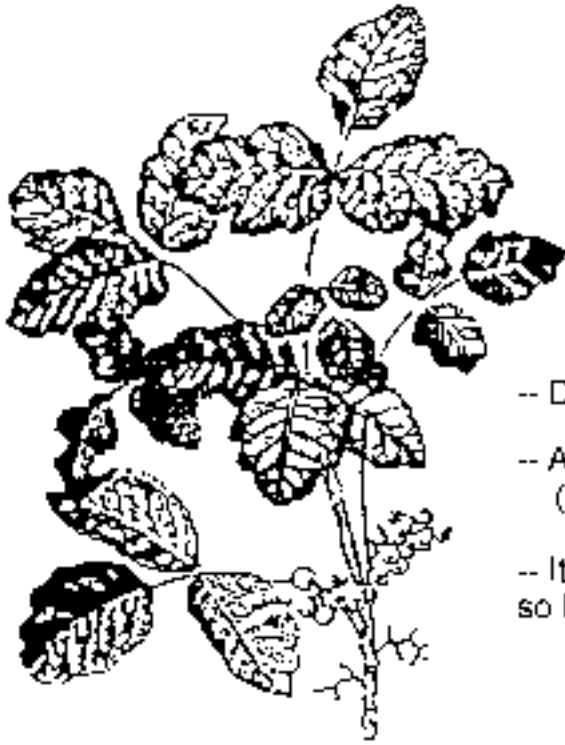
(2) If students share goggles, the goggles must be cleaned and disinfected after each use.

### b. Collecting Organisms

Field study should not include the collection of organisms unless a valid educational purpose is served by the collection and adequate research has been done to ensure both the safety and legality of the collection.

### c. Containers

Use plastic, paper, or cloth containers to prevent cuts and loss of specimens due to breakage. Avoid glass collection jars or containers where possible.



## Poison Ivy

- Distinguishable by "Three leaflet" form
- Abundant around trees and other structures (stumps, fences, etc ) in the form of a vine
- It can be hard to detect as plain shrubbery so be aware of the "Three Leaflet" characteristic.

## Poison Oak

- More common as a ground shrub
- Upright stems
- Also possesses the "Three-Leaflet" characteristic



<http://www.sanaturalareas.org/eisenhower/>

# Dwight D. Eisenhower Natural Area Park



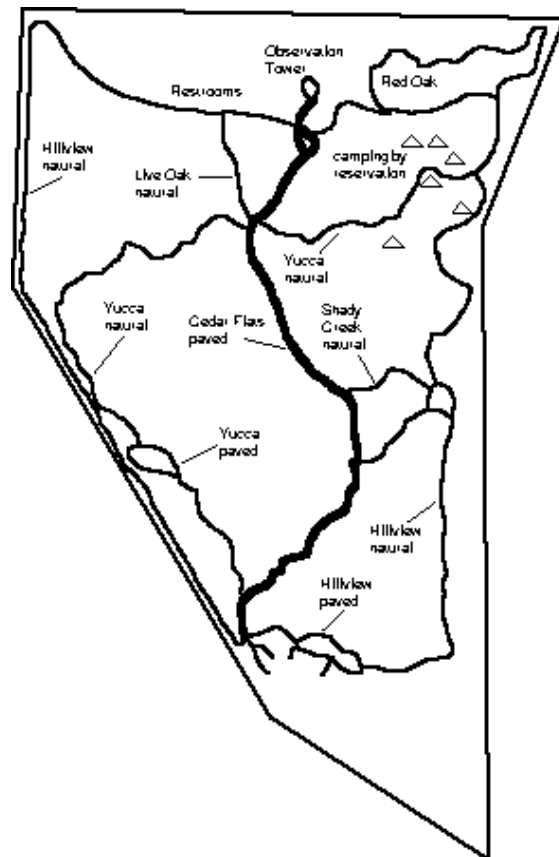
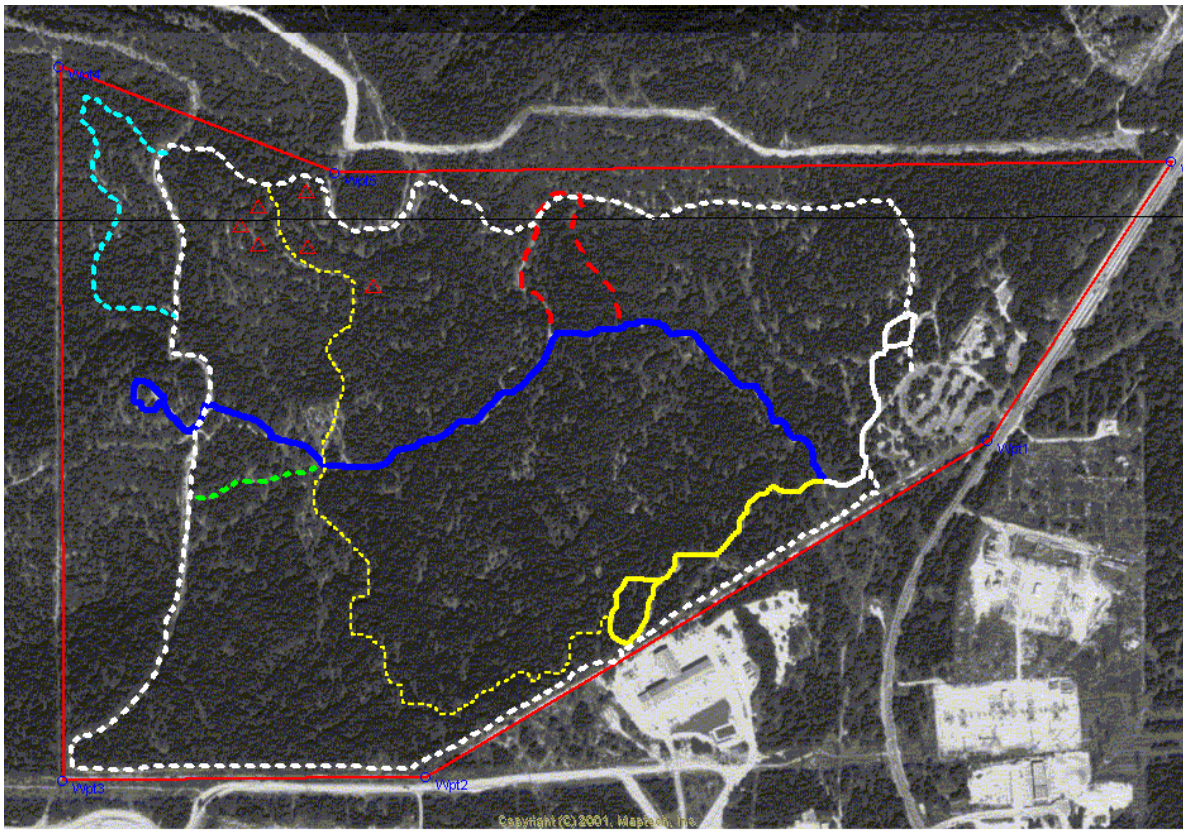
*19399 NW Military Hwy*

*Open seven days a week (except Christmas and New Year's)*

*The park is open from 6 a.m. to dusk.*

**Eisenhower Park**, south of Camp Bullis on Northwest Military Drive, offers an additional five miles for hiking, jogging and nature study. Special markers, designating examples of Texas Hill Country vegetation, have recently been added along portions of selected trails. A marker guide is available at the trailhead near the public rest rooms. This 320-acre park contains excellent examples of Texas Hill Country landscapes, including wooded dry creek beds and rocky canyons. Pets are allowed on leash, but please be prepared to remove any droppings your pet may leave. Barbecue and picnic facilities are available. Overnight campsites and a large event pavilion are available by reservation. Two smaller pavilions may also be reserved. (Call **210 207-3120** for facility reservations.) No roller blades, scooters, bicycles, etc. are allowed and hikers are required to stay on designated trails. To help preserve the health and beauty of this sensitive natural area, please do not disturb the plants, rocks or animals.

Eisenhower Park is located at 19399 NW Military Hwy in San Antonio, Texas. Take FM 1535/Military Hwy exit off Loop 1604 on the city's northwest side. Go north on FM 1535/Military Hwy about 2 miles. Park entrance is on the left, just before Camp Bullis.



# MARKER GUIDE



1. *Kidneywood* — *Eysenhardtia texana*
2. *Evergreen Sumac* — *Rhus virens*
3. *Cedar Elm* — *Ulmus crassifolia*
4. *Twist-leaf Yucca* — *Yucca rupicola*
5. *Texas Prickly-pear* — *Opuntia lindheimeri*
6. *Hog-plum* — *Colubrina texensis*
7. *Texas Sotol* — *Oasylirion texanum*
8. *Honey Mesquite* — *Prosopis glandulosa*
9. *Agarita* — *Berberis trifoliolata*
10. *Eve's Necklace* — *Sophora affinis*
11. *Plateau Live Oak* — *Quercus Fusiformis*
12. *Mountain Cedar (male)* — *Juniperus ashei*
13. *Hackberry* — *Celtis laevigata*
14. *Texas Persimmon* — *Oiospyros texana*
15. *Greenbrier* — *Smilax bona-nox*
16. *Mexican Buckeye* — *Ungnadia speciosa*
17. *Eastern Gamagrass* — *Tripsacum dactyloides*
18. *Texas Red Oak* — *Quercus buckleyi*
19. *Shin Oak* — *Quercus sinuata* var. *breviloba*
20. *Bear-grass* — *Nolina texana*
21. *Turk's Cap* — *Malvaviscus drummondii*
22. *Texas Redbud* — *Cercis canadensis* var. *texensis*
23. *Escarpment Cherry* — *Prunus serafina* var. *eximia*
24. *Gum Bumelia* — *Bumelia lanuginosa*
25. *Shrubby Boneset* — *Eupatorium havanense*
26. *Carolina Buckthorn* — *Rhamnus caroliniana*
27. *Fragrant Sumac* — *Rhus aromatica*
28. *Catclaw* — *Acacia roemeriana*
29. *Shrubby Croton* — *Croton fruticosus*
30. *Poison Ivy or Poison Oak* — *Toxicodendron radicans*
31. *Silk Tassle* — *Garrya lindheimeri*
32. *Mountain Cedar (female)* — *Juniperus ashei*
33. *Flame-leaf Sumac* — *Rhus copallina* var. *lanceolata*
34. *Lindheimer's Senna* — *Cassia lindheimeri*
35. *Mountain Grape* — *Vitis monticola*
36. *Pink Mimosa* — *Mimosa borealis*
37. *Tickle-tounge* — *Zanthoxylum hirsutum*
38. *Elbow-bush* — *Forestiera pubescens*

The trail markers may be found along portions of the Cedar Flats and Shady Creek trails, as well as along parts of the natural surfaced sections of the Hillview and Yucca trails. Each marker designates an example of Texas Hill Country Vegetation.

## Conducting Field Trip Investigations: Station One

### FIELD OBSERVATION

#### MATERIALS:

For each team or pair-

- 1 wind meter (see instructions at the end of this activity to construct meter)
- 1 compass
- 1 brown paper towel
- Student Observation Worksheet in Field Notebook
- Pencil or pen



For each teacher

- 1 outdoor thermometer
- 1 rain gauge

#### PREPARATION: Before arriving at the site-

- Please divide the class into groups of four.
- Students should construct the wind meters in class **before** arriving at the field site.
- Ensure that each student has their field notebook.
- Research the last significant precipitation that has fallen in the Eisenhower Park area (optional).

#### TIME:

30-45 minutes

#### ACTION:

1. Beginning in the parking area, introduce the students to the field investigation by telling them to look around and observe the environmental conditions (temperature, humidity, wind, etc) around them. Introduce them to the term environmental conditions.
2. Precipitation-The teacher should begin by placing the rain gauge in an open area obstructed from any overhanging objects. Discuss with the students why the rain gauge should be placed in an area where there are no over-hanging limbs or a roof, etc. *(Water can drip off of the limbs giving a false reading on the rain gauge or it may allow too much to drip in causing a false reading)*. Inform the students that you will return to check on the rain gauge when the field investigation is over.  
If research was done on last significant precipitation in Eisenhower Park- Ask students to observe the effects of the recent precipitation. *(Is the vegetation*

*green? Is water flowing down the creek?) If the research was not done, ask students to predict if the area has seen much precipitation recently (use the same observations as mentioned above).*

3. Temperature-Show students how to use an outdoor thermometer. *(Place the thermometer in an outdoor shady location. Note: If the thermometer is receiving direct sunlight during this exercise, the reading will not be correct).* Inform the students that you will return to check on the thermometer in a few minutes.
4. Wind Speed- Show students how to use the wind meter you constructed in class. *(Either hold the wind meter by the handle or place it into the ground. As the wind blows, the flapper card will move up toward the wind speed scale. On the observation sheet, record the highest speed that the flapper card reaches.*
5. Wind Direction- Show students how to use a compass. *(A compass is an instrument used to show direction. A compass's needle always points north. The four cardinal points should be clearly defined on your compass- North, South, East and West. Have the students lay the compass flat in one of their hands. Move the compass around until an arrow or a N (for North) is directly at the top of the compass. You might try explaining the compass like a clock. North would be at the 12:00 position and South would be at the 6:00 position.)* Using the compass with the students facing north, ask them to record the direction of the wind on their observation sheet.
6. Have students return to the thermometer and record the temperature on their observation sheet. After recording the temperature, place the thermometer in direct sunlight. Inform the students that you will again return to check on the thermometer in a few minutes.
7. Moisture- Explain the use of the brown paper towel for the moisture test.
  - A. Touch or rub the towel on soil, leaves, or grass.
  - B. If any part of the towel darkens, there is moisture at that spot.
  - C. Record results on the observation sheet
8. Have students return to the thermometer a second time and record the direct sunlight temperature on their observation sheet. Conduct a discussion on the different readings based on exposure to the sun. Inform the students that official temperatures are always taken in the shade.

FIELD DISCUSSION:

1. How might the direction or the speed of the wind affect plants and animals?
2. How might the temperature, direction of wind, moisture, etc. (environmental conditions) change during the day?
3. Why do you think it is important to know these environmental conditions before beginning your field study?

## Conducting Field Trip Investigations: Station Two

### WHAT COMES AROUND GOES AROUND

#### MATERIALS:

For each team-

- Sheet labeled "Water Cycle" in their field notebook
- Site map
- Pencil or pen

For each teacher

- Small container of water
- Clear plastic sandwich bag
- Piece of chalk

#### PREPARATION: Before arriving at the site-

- A few days before arriving at the site, conduct a classroom discussion on the water cycle describing each step: Evaporation, Condensation, Precipitation, Runoff/Infiltration, Transpiration. Write the steps and definitions on the board.
- IMMEDIATELY after arriving at the site, walk to the area where this activity (station four) will be conducted. Find a large tree in a sunny place. Tie the clear sandwich bag over a few leaves. In an hour or so, you should see tiny drops of water inside the bag from transpiration. This will be explained to the students during the activity.

TIME: 15-20 minutes

#### ACTION:

1. Before beginning this lesson, pour a small amount of water on the sidewalk creating a puddle of water. Draw a chalk-line around the puddle. Instruct the students that we will come back to the puddle in a few minutes.
2. Ask the students to explain to you where water comes from? (*The water cycle*) What are the steps of the water cycle? (*Evaporation, Condensation, Precipitation, Runoff/Infiltration, Transpiration*).
3. Ask the students to draw a picture of what they think the water cycle looks like on the page labeled "Water Cycle" in their field notebook.
4. Outline the objective for the day: The students will be able to identify the steps of the water cycle and then actually see the water cycle in motion.

5. Go back to the puddle and see how much of it is gone. What happened to the water? (*evaporation*) Lead a discussion on evaporation. Remind the students of the temperature reading that they took at the beginning of the investigation. How would evaporation be effected if the temperature were higher? What about if it were lower?
6. Next, ask the students to look into the sky. What do they see? Are there any clouds? How did they get there? What are they made of? What part of the water cycle is this? (*condensation*). Lead the class in a discussion on how water condenses in the air.
7. Ask the students the question: Do you sweat? (*Yes*) What happens to the sweat when we cool down? (*It evaporates and becomes part of the water cycle*). Do you think that trees sweat? (*Yes, it is a process that we call transpiration*). Next, walk over to the sandwich bag hanging on the limb. There should be small drops of water (*transpiration*) that have formed in the bag (amount will vary depending on amount of sunlight). Lead a discussion on transpiration. Remind them that this water also evaporates into the atmosphere and becomes part of the water cycle.
8. Walk back to the sidewalk and ask: What happens when the clouds get cool? (*precipitation falls*). What four forms does precipitation take? (*Rain, snow, sleet, hail*). What happens when the precipitation hits the ground? (*It either infiltrates into the ground creating groundwater or it runs off into surface water (creeks, lakes, rivers, oceans)*). Demonstrate these two concepts by pouring some water on the sidewalk and watching it runoff and pouring water on the ground and watching it infiltrate. What can the groundwater be used for? (*People can drink groundwater. The Edwards Aquifer, San Antonio's supply of water, is groundwater that is formed by rainwater soaking through the ground.*) What would happen if all the grassy areas around local creeks were paved over with concrete? (*There would be a high level of runoff which could cause increased flooding.*) Inform the students that they will conduct an activity later that will look at how vegetation (*grasses, plants, etc.*) helps with runoff.
9. Now that the water has fallen back to earth, what happens next during the water cycle? (*The process starts all over again*).

**Conducting Field Trip Investigations: Station Two**  
**WHAT COMES AROUND GOES AROUND- Teacher Sheet**  
Questions to ask while leading this activity:

- Action 2-     Question: Where does water come from?  
                  Answer: The water cycle  
                  Question: What are the steps of the water cycle?  
                  Answer: Evaporation, Condensation, Precipitation,  
                  Runoff/Infiltration, Transpiration
- Action 5-     Question: What happened to the water in the puddle?  
                  Answer: Evaporation
- Action 6-     Question: What do you see when you look in the sky?  
                  Answer: Clouds  
                  Questions: Are there any clouds? How did they get there? What are  
                  they made of? What part of the water cycle is this?  
                  Answer: The clouds are made up of water vapor. This process is  
                  called Condensation.
- Action 7-     Question: Do you sweat?  
                  Answer: Yes  
                  Question: What happens to the sweat when we cool down?  
                  Answer: It evaporates and becomes part of the water cycle.  
                  Question: Do you think that trees sweat?  
                  Answer: Yes, it is a process that we call transpiration.
- Action 8-     Question: What happens when the clouds get cool?  
                  Answer: Precipitation falls.  
                  Question: What four forms does precipitation take?  
                  Answer: Rain, snow, sleet, hail  
                  Question: What happens when the precipitation hits the ground?  
                  Answer: It either infiltrates into the ground creating groundwater or  
                  it runs off into surface water (creeks, lakes, rivers, oceans).  
                  Question: What can the groundwater be used for?  
                  Answer: People can drink groundwater. The Edwards Aquifer, San  
                  Antonio's supply of water, is groundwater that is formed by  
                  rainwater soaking through the ground.  
                  Question: What would happen if all the grassy areas around local  
                  creeks were paved over with concrete?  
                  Answer: There would be a high level of runoff which could cause  
                  increased flooding.
- Action 9-     Question: Now that the water has fallen back to earth, what  
                  happens next during the water cycle?  
                  Answer: The process starts all over again.

## Conducting Field Trip Investigations: Station Three

### SENSING YOUR WAY

#### MATERIALS:

For each student-

- Sights, Sounds and Smells & Touch worksheet in Field Notebook
- Poetry Trail activity sheet in Field Notebook (Optional)
- Pencil or pen
- Site map
- Compass



For each teacher-

- Bag or backpack or jar for collecting samples
- Site map
- Poetry style Teacher sheet

#### TIME:

20-25 minutes

PREPARATION: Before arriving at the site-

- Conduct an overview of poetry styles as outlined on the Poetry Style Teacher worksheet. (You may wish to do this overview in the field instead).

#### ACTION:

1. After conducting the Field Observation #1, instruct the students that they are going on a nature hike. While walking, they should observe and fill out the Sights, Sounds, Smells and Touch worksheet.
  - Sights (What do they see? Grasses, trees, houses, people, etc.)
  - Sounds (Are there dogs barking? Airplanes overhead? Wind blowing? Birds singing? Cars? Etc.)
  - Smells (Are the flowers and grasses blooming? People cooking? Water polluted?)
  - Touch (Is the grass scratchy? Bark on the trees rough? etc.)

Students can stop along the trail to write or draw their observations or may wait until they get to the end of the trail.

POETRY TRAIL (Optional- Can be done in the field or after returning back to class).

1. Ask students to take one of their specific "sense" observations and use the descriptive words that they came up with on their Sights, Sounds and Smells & Touch worksheet. For example, if they choose the sense of touch, a student may have words like "rough," "sharp," "warm," or "cool."
2. Ask them to write one of the types of poems discussed earlier in class or here in the field using this vocabulary. Have them use the Poetry Trail Activity Sheet in the Field Notebook.

#### MAPPING AND COLLECTION EXERCISE

1. Ask the students to draw the entire trail on their maps. Ask the students to use their compass to record which direction they walked.
2. Without disturbing the environment or killing any insects or animals, allow students to place a few samples in a backpack, bag or jar such as dried leaves, twigs and stones and even trash including cans, paper, etc.

#### FIELD DISCUSSION:

1. Discuss with the students what they saw, heard and smelled. Why might these observations be important to the area that you are studying?
2. What other kinds of things might the students see, hear or smell if they came to this location at a different time of the year.

#### POST FIELD INVESTIGATION-After returning back to school

1. Have the students make a mural or collage that includes everything they found on the walk.
2. Challenge the group to think of ways that things are connected to one another. For example, a bird might be connected to a tree where it can build a nest.

## Conducting Field Trip Investigations: Station Three

### SENSING YOUR WAY

Teacher Sheet

### POETRY STYLE SHEET

Acrostic: Verses where the first letters of each line name someone or something or convey a special message. For Example:

<b>b</b> usy	<b>n</b> atural
<b>i</b> nteresting	<b>a</b> lways
<b>r</b> efined	<b>t</b> ruth
<b>d</b> azzling	<b>u</b> ntouched
<b>s</b> pirited	<b>r</b> aw
	<b>e</b> verlasting
=birds	=nature

Alliteration: Verses where all the words begin with the same letter. For example:

Two tall trees try to touch tenderly.  
Five freaky frogs fight fearlessly.

Haiku: A form of Japanese poetry that follows a structured pattern. For example:

Line 1: 5 syllables	Soft wings fluttering
Line 2: 7 syllables	Bright colors flying through air
Line 3: 5 syllables	Lovely butterfly

Windsparks: Verses with the following patterns:

Line 1:	"I dreamed"
Line 2:	"I was" someone or something
Line 3:	Where
Line 4:	Action
Line 5:	How

For example:

I dreamed	I dreamed
I was poison ivy	I was a leaf
In the woods	Growing in the forest
Providing itches and rashes	Providing food for caterpillars
Gleefully	Unwillingly

Cinquain: Verses with the following pattern:

Line 1: One word title

Line 2: two words describing title

Line 3: three words showing action

Line 4: four words showing a feeling about the title

Line 5: one word (simile or metaphor for the title)

For example:

Water

Still, quiet

Reflects, listens, shimmers

Waiting for a splash

Silence

Trees

Monumental, majestic

Towering, soldiering, guarding

Whispering giants standing tall

Sentries

## Conducting Field Trip Investigations: Station Four

### THE HILL COUNTRY COMMUNITY

#### MATERIALS:

For each team-

- Community Survey Data Sheet
- Site map
- Pencil or pen
- Survey string (colored if possible-can be found at hardware store)
- Field sheet for animal tracks (optional)

For each teacher

- Bags for collecting leaves to transport back to school

#### PREPARATION: Before arriving at the site-

- A few days before arriving at the site, discuss two concepts that will be discussed during the field investigation. Write the words and definitions on the board. The concepts include:
  1. Inventory- a listing of all the different kinds of plants and animals found in an area. The total number of organisms.
  2. Impact- how the plants and animals in the inventory affect (positive and negative) the stream.
- Prepare pieces of survey string by cutting them into 8-10 foot sections. Ensure that each group of students will have a piece.

TIME: 45 - 1 hour

#### ACTION:

1. Review with the students the two concepts mentioned in class earlier: Inventory and impact. Outline the objective for the day: The student investigation will involve discovering what makes up the streamside community and how this community can impact (both positive and negative) the stream itself.
2. Set the limits to the study site making it clear that no one leaves the site for any reason unless the teacher is asked.
3. Instruct the students to spread out within the study site and pick a particular study spot. Hand each group a piece of survey string and designate one student from each group as a "center" one as a "sweeper" and two as "investigators".



4. The study spot will be a circle having an 8-10 foot radius. Instruct the “center” to take hold of one end of the string. Instruct the “sweeper” to take the other end of the string and stretch it out until it is tight (this should be 8-10 feet from the “center”). Ask the “sweeper” to lay a stick or rock or some other item next to his/her feet to mark his/her starting point.
5. Instruct the two “investigators” to stand shoulder to shoulder, parallel to the string, between the “center” and “sweeper”.
6. Next, instruct the designated “center” to remain in one place as the “sweeper” moves in a circle around him/her. Have the “sweeper” move very slowly, keeping the string tight at all times. At the same time, the “investigators” will move with the string keeping an eye on the ground for any Hill Country community signs (leaves, footprints-man or animal, trash). The “investigators” should record their findings on the Community Survey Data Sheet as they move along.
7. When the “sweeper” reaches their starting mark, the group should stop.
8. Ask the students to put down their string and to collect 4 to 5 leaf samples from their study area. If possible, have them pick up different leaf samples. The leaves will be used later when they return to the classroom (See Classroom Activity-Station Four).
9. Ask the students to draw their study area on their site maps.
10. (Optional) The group may pick a different location and repeat steps 4-8 this time with a new “center”, “sweeper” and “investigators”.
11. (Optional) If animal tracks were found in the study spot, use the Field Sheet for Animal Tracks to identify the types of tracks found.

#### FIELD DISCUSSION:

1. Ask the students which animals they think are the most abundant in the study area? How did they know? (*man-footprints? Other animals-tracks?*)
2. What other impact have you seen in this area? (*car, bicycle, other off-road vehicle tracks?*)
3. Do you think that if you walked into a forest on top of a mountain, would the plants there be the same as the ones you found in the Hill Country? Why?
4. If you walked into another type of “natural” community in this area of San Antonio, might it have been impacted the same? What about in a completely different part of San Antonio? Why or why not?
5. How do you think that these impacts in your study area could affect water quality?

## Conducting Field Trip Investigations: Station Five

### THE HILL COUNTRY COMMUNITY- CLASSROOM ACTIVITY LEAF IT TO US

#### MATERIALS:

For each team-

- Leaves collected from the previous walk
- Poster boards
- Marking pens (one set)
- Trees and shrubs identification guide (optional)
- Index cards (several for the group)



#### TEACHING TIPS-

- Most identification guides are too difficult for third and fourth graders to use. You can use the guide as the students sort their leaves.
- Remember that the proper names of the leaves are not important to this study. A common name or just a descriptive name that everyone can agree on will be sufficient.
- Students will be sorting large numbers of leaves. Be sure that there is a lot of working space for them.

TIME: 45 minutes

#### ACTION:

1. Inform students that data collected in the field can be used to find out which plants and animals are the most abundant. Ask the students: "Were there certain species of trees or bushes which were more common than others?" Ask the students one of the same questions you asked in them in the field: "Do you think that if you walked into a forest on top of a mountain, would the plants there be the same as the ones you found in the Hill Country? Why?"
2. Students should sort their leaf samples. They will work in their groups placing all the leaves of one type together in a pile. They must agree within their group on the number of different types of leaves in their collection.
3. When the students have sorted their leaves, the teacher helps them to identify them. This can be done by holding up a sample and giving its name, with the students find those that match. If you don't know the name of the plant from which the leaf came, instead you may just use a descriptive word that the class agrees on. The accepted name can be obtained later from someone experienced in plant identification; it is not important at this time. Students write down the name on an index card and place the card with the pile.

4. Students count the numbers of each type of leaf and write the number on the index card.
5. With help from the teacher, the students can then make a graph to represent their group's field data using the Plant Inventory Results worksheet (attached). They fill in the name of each identified species at the bottom of a column, then color in one square for each leaf.
6. Students can then prepare the leaves so that they can be attached to a poster for display. Each group makes a leaf identification poster. The leaves and index cards should be attached to the poster. Along with the names and numbers of individual plants found, students may wish to add other information they can find out about the plants.
7. Determine which plants are the most abundant in the study area. These can be referred as the indicator species for the Hill Country. These species should be found throughout the Hill Country.

## Conducting Field Trip Investigations: Station Five (Optional)

### What is NATURE Journaling?

Nature journaling simply means drawing what you see, identifying and making notes about where you find the specimens, and even including poetry or prose regarding them. The Victorians gave us shining examples of what could be done. Learning to keep a nature journal offers many new practical, as well as aesthetic experiences. It develops skills in observation, attentiveness, drawing, handwriting, prose, poetry, identification, and scientific classification, just to name a few. Keeping a Creative Journal is a tool for personal growth using writing and drawing, somewhat like a diary.

#### Express feelings and thoughts;

- Play with new media of expression such as color, images and symbols
- Sort out seemingly random experiences in your life;
- Make more conscious choices and decisions;
- Define and implement changes
- Get a clearer picture of your creative potential and how to use it;
- Deal with creative blocks and negative patterns;
- Enrich your relationship with yourself and others;
- Find deeper meaning in your life.

#### What Forms of Expression do you use?

- drawings, doodles, and scribbles
- prose and poetry
- dramatic dialogs and letters
- graphs and charts
- and colors, abstract designs, images, and symbols
- 

#### Creative Journaling is a tool for:

- personal growth
- health and healing
- inner child work
- creativity development
- life planning
- career and talent development
- parenting kids and teenagers
- spiritual practice

#### Nature Journaling Exercise

1. Scout your location. Try to find a place that suites your needs.

2. Choose a place. Spend ten to fifteen minutes sitting and paying attention with all of your senses to everything that surrounds you. What do you smell? What do you hear? What do you see? When you are ready, begin recording as many details as you can in your journal (Don't forget to record the place, date, time, and weather at the beginning of your entry).

### Exercise Options

Find a patch of ground about one square foot in size. Record your thoughts that pertain to just that spot.

Sit in a place where you can see the sky without trees or buildings blocking your view. Look up and draw the clouds as they float over your head. Clouds do not stay the same shape for long so you will have to draw quickly. Label the cloud images you see.

Park yourself near a bird feeder and write about/draw the birds as they come to eat. Try to describe the flying style of different birds. Describe the sounds they make.

Listen to the wind. The wind makes some great sounds as it blows through different trees, a person's hair, a flag, a boat's sail, your baggy pants, etc . . . Try to listen to the wind's various sounds and record them in your journal. Try to imagine what the wind is saying to you.

### Resources

Keeping a Nature Journal: Discover a Whole New Way of Seeing the World Around You

by Clare Walker Leslie, Charles E. Roth

Nature Journaling: Learning to Observe and Connect with the World Around You  
By Claire Walker Leslie

<http://www.naturallycurious.com>

## Conducting Field Trip Investigations: Station Six

### GOING...GOING

#### MATERIALS:

For each team-

- “Data Collection” page in the field notebook.
- Pencil or pen

For each teacher

- Small container of water

#### PREPARATION: Before arriving at the site-

- Lead a classroom discussion on water erosion including some of its effects and its impacts on local waterways or recharge of aquifers.

TIME: 1 hour 30 minutes

#### ACTION:

##### 3 Activities:

##### DATA COLLECTION GROUP WALK

1. Ask each group of students to choose a location in which they can walk side by side for 100 steps, unobstructed (an area where they won't run into water, high grass, etc).
2. Ask the students in each group to stand shoulder to shoulder, facing the same direction. Instruct each group to choose one member to act as the record keeper.
3. Instruct the record keeper to turn to the page entitled “Station Five Data Collection” in their field notebook.
4. Instruct each group of students to walk in a straight line for 100 steps. Each member should begin the walk by taking their first step with their left foot. Every time they step on their right foot (each second step), they are to stop and inform the record keeper of the ground type under their right foot (grass, bare earth or rock). The record keeper will record the information on the data collection sheet given to him/her during each right foot step (second step). The record keeper should also record his/her own observation as well.

5. After all the groups have completed their data collection, regroup and discuss the results as a whole class. Did the group see more bare earth or grass or rock? Where they the same? What kind of impact would the bare earth have on a local waterway? (*Bare earth usually allows for more soil to be washed away during precipitation. Soil is considered a form of water pollution.*) What about the rock? (*A rocky ground type would hold more soil in place than an area of bare earth. However, a good amount of erosion can occur in a rocky area. Also, a rocky area may have been created from an area where all the soil has been washed away.*) What about a grassy area? (*A grassy area is the best type of groundcover to have to prevent erosion. Grass holds the soil in place and may even help to filter out pollutants in the water.*)
6. Inform the students that you are now going to do two more activities that will demonstrate these concepts.

### WATER WEIGHT EROSION

How does the weight of water affect the earth?

1. Find a spot of bare dry earth.
2. Pour a cupful of water on it. Repeat on the same spot, but this time hold the cup from as high a distance as possible. Observe. How did the earth change when you poured your first cupful of water? How did it change when you poured the second cupful from a greater height? What do you think would happen if the ground was covered with rock?
3. Repeat step #3 but this time, do the exercise on a grassy area.

### PLANTS VS. SOIL ALONG A CREEK

1. Inform the students that you are now going to play a game that simulates how plants function as sediment traps.
2. Divide the class into two teams:  
Team 1 will be “plants” growing along the creek’s shoreline and Team 2 will be “soil particles.”
  - A. The plants form an irregular line at one end of the field, spaced so their outstretched arms do not touch.
  - B. The area behind the plants is designated the waterway.
  - C. The soil particles line up facing the plants and, on a signal, must make their way to the waterway without being touched by a plant. Slow the soil particles by requiring them to drag one foot.
  - D. The plants may bend, stretch and stoop, but may not move their feet (“roots”) in order to tag the soil particles. Soil particles may not go around the end of the plant line.

- E. When a soil particle is tagged, he or she becomes a plant at that exact spot.
  - F. The game continues until all the particles at the start of the game are caught or escape to the waterway.
3. After the game, discuss the roles played and relate the results of the rounds to what actually happens when it rains.
    - A. Were the plants able to trap more particles in areas where they grew close together?
    - B. What happened when there were gaps or bare spots in the line of plants?
    - C. Why are shorelines or wetlands plants important to the water that they border?
  4. Ask students to suggest some solutions to problems of erosion, based upon the game.
  5. Ask students to name some signs of erosion. Take them on another walk to look for these signs. Look for: muddy water in puddles or in the creek; water dripping onto bare slopes with paths that seem to have been carved by water; gullies; soil washing away from construction sites or other areas where the ground and plants have been disturbed.
  6. At each sign located, ask:
    - A. Can you tell where the soil went?
    - B. Can you find any structures built by man to control erosion?
    - C. Do these devices appear to work? Find natural materials or situations that help to control erosion.
    - D. How do these help to slow erosion.

FOLLOW-UP:

After returning to the classroom, have students take the results from their data collection on the Data Collection Group Walk activity and create a graph showing the percentages of bare earth, rock and grasses that they discovered. Do you think that these percentages are a good representation of the entire Hill Country along waterways?



**Conducting Field  
Investigations**



# **EISENHOWER PARK**

## **Student Notebook**

**Conducting Field Trip Investigations: Station One**  
**FIELD OBSERVATION**

Student Page

**STUDENT OBSERVATION WORKSHEET**

PRECIPITATION- Using the rain gauge, how much precipitation fell during the Field Investigation? \_\_\_\_\_

Observation: Observe the effects of recent precipitation (or lack of precipitation) and write your observations here.

TEMPERATURE- Using the thermometer, record the temperature.  
\_\_\_\_\_ temperature in shade  
\_\_\_\_\_ temperature in direct sunlight

WIND SPEED- Using your wind meter, record the wind speed.  
\_\_\_\_\_ kilometers per hour

WIND DIRECTION- Using the compass, record the direction that the wind is blowing.  
(Check one)

- |                                    |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| <input type="checkbox"/> North     | <input type="checkbox"/> South     | <input type="checkbox"/> East      | <input type="checkbox"/> West      |
| <input type="checkbox"/> Northeast | <input type="checkbox"/> Northwest | <input type="checkbox"/> Southeast | <input type="checkbox"/> Southwest |

MOISTURE- Using the brown paper towel, rub the towel on soil, leaves or grass. If any part of the towel darkens, there is moisture on that spot. Record observations here.

OTHER OBSERVATIONS-

**Conducting Field Trip Investigations: Station Two**  
**WHAT COMES AROUND GOES AROUND**  
Student Sheet

**WATER CYCLE**

Draw a picture of what you think the water cycle looks like.

**Conducting Field Trip Investigations: Station Three**  
**SENSING YOUR WAY**  
Student Sheet

**SIGHTS, SOUNDS, SMELLS & TOUCH WORKSHEET**

Think of words that describe the area you are walking. Write down your observations and words on this sheet.

1. SOUND

Descriptive words:

Observations:

2. SIGHT

Descriptive words:

Observations:

3. Touch

Descriptive words:

Observations:

4. Smell

Descriptive words:

Observations:



**Conducting Field Trip Investigations: Station Four**  
**THE HILL COUNTRY COMMUNITY**  
Student Page

**COMMUNITY SURVEY DATA SHEET**

Date: \_\_\_\_\_  
Investigator's Name: \_\_\_\_\_  
School: \_\_\_\_\_

Write what you see on the lines to the left and how many you see of them on the lines to the right.

Evidence of Hill Country Community

Animal Signs (footprints, scat, webs, etc.)

Number

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Human Signs (footprints, tracks, trash, etc.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Natural Signs (leaves, sticks, etc.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Other

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**Conducting Field Trip Investigations: Station Six**  
**Going...Going**  
 Student Sheet

**Data Collection**

<b>Right Step</b>	<b>Bare Earth</b>	<b>Rock</b>	<b>Grasses</b>
<i>Example</i>	//	/	/
Step 2			
Step 4			
Step 6			
Step 8			
Step 10			
Step 12			
Step 14			
Step 16			
Step 18			
Step 20			
Step 22			
Step 24			
Step 26			
Step 28			
Step 30			
Step 32			
Step 34			
Step 36			
Step 38			
Step 40			
Step 43			
Step 44			
Step 46			
Step 48			
Step 50			