



# *Earth Camp*

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## *Scavenger Hunt*



Bull Creek Preserve

Scavenger Hunt

### **Concept**

Introduction to the geography, flora and fauna, physical science, natural history, surface water, and groundwater of a watershed.

### **Objective - Students will:**

- 1) locate the boundaries of a watershed;
- 2) predict the flow of water in a watershed by identifying downhill pathways;
- 3) use a map and compass to identify direction, locate points of interest, and define land use;
- 4) discover fossils;
- 5) locate and identify animal signs;
- 7) use a thermometer to measure temperature, and;
- 8) use senses to observe and evaluate water quality.

**Time** 2.5 hours, 0.6 miles

**Materials:** Earth Camp Teacher Assistant will provide materials

- Wax pencil
- "Bull Creek Scavenger Hunt" student game sheet
- "Bull Creek" trail map
- "Bull Creek Land Use" map
- "Creek Observations Data Sheet"
- Compasses
- Thermometers

REMINDER: BEFORE LOADING THE BUS, HAVE STUDENTS USE THE RESTROOM. THE FACILITIES AT BULL ARE DIFFICULT TO ACCESS.

## LESSON: Bull Creek Preserve

### Introduction

(At the entrance with the entire group.)

1. Ask students to define a watershed. (Land area that drains to a creek, river, or lake.)  
Ask students if they are standing on a watershed. (Yes)
2. Ask students to identify possible watershed boundaries for Bull Creek. (The tops of the hills.) The low point in the watershed is where Bull Creek is located and where the runoff collects.
3. Describe rainwater runoff from the natural area in the preserve and park. (Plants act as a filter for pollution, so runoff from a natural area will be cleaner as it enters the creek. Also, chemicals are not applied in a natural area.) Compare to runoff from a street or lawn. (The street and lawn could have chemical pollutants, such as oil or fertilizer, that could runoff and pollute the creek.) Tell students they have choices they will learn about at Earth Camp that will help keep rainwater runoff unpolluted.
4. Stormdrains - Discuss how water drains from the streets in the neighborhoods in Bull Creek Watershed, into the stormdrain, and enters the creek. Some people think the stormdrains go to a treatment plant where the trash and pollution are cleaned from the water, but actually the water goes straight into the creek, along with any trash or pollutants the water picked up as it traveled across the lawns, driveways, and streets.
5. Tell students they will investigate the natural watershed at Bull Creek Park to discover plants, animal signs, fossils, rocks, and springs. The things students will find at Bull Creek Watershed are found in most of the watersheds in Austin, including your school's watershed.
6. Discuss the rules of a park: 1) STAY ON THE TRAIL 2) WALK, DON'T RUN 3) BE QUIET SO YOU CAN OBSERVE NATURE, 4) DO NOT LITTER, and 5) DO NOT DISTURB THE PLANTS OR ANIMALS. This is a park and is meant to preserve the land and provide a place for people to play and swim.

### Procedure

1. **Introduce Scavenger Hunt** - The students will lead, but the group must stay together with an adult leader. All students have to see the item found. Tell students you will stop at each item and have a discussion or a lesson.
2. **Form Groups** - Ideally the class will be divided into two groups, each with a trained adult leader with a backpack of materials from the Field Trip Kit. Within these two groups students work in partners with their materials.

### **3. Teach students how to use the map and compass.**

- Ask students to identify the symbols on the trail map. Circle the symbols that represent something they are to find on the scavenger hunt.
- Ask students to find their location on the map. Use the compass rose to identify N, S, E, W on the map. Identify the trail and cardinal direction you will be hiking.
- Demonstrate how to determine direction using a compass:  
A compass is a scientific instrument that uses magnetism to determine direction. The arrow in the middle of the compass is a magnet. It is attracted to the north and south pole. The red tip of the arrow will always point north. The silver tip of the arrow will always point south. The letter N or S will not match the arrow until the compass is rotated to the correct position.
- Give each student a compass. Ask them to position the compass to locate the directions.

**4. Start the Scavenger Hunt.** Manage behavior, give hints, help with directions, take a vote when there is disagreement, etc. Stop at the noted locations and do the mini-lessons.

## **SCAVENGER HUNT**

### Mini-Lessons

#### **Algae**

Algae is a slimy plant found in the water. It is necessary for a healthy creek because some fish eat algae and it provides shelter to some animals. Too much algae in the creek is caused by fertilizer runoff. Too much algae can cause some of the animals to die.

#### **Animal Scat/Tracks**

Many wild animals live close to the creek because it is their drinking water source. They are dependent on clean water in the creek for survival. Bull Creek flows to Lake Austin where we get some of our drinking water.

#### **Bird Song**

There are three things a bird needs to be attracted to this park. What are they? (seeds for food, trees for nests, water in the creek)

#### **Bull Creek**

- Stop at the creek and complete the "Creek Observations Data Sheet." Needed equipment is in the backpack provided.
- Students will take the temperature of the creek using celcius/fahrenheit thermometers. Show students where to record their answers on the "Creek Observations Data Sheet." Compare the temperature of springs in Austin (68 degrees) to the temperature of the creek. Explain : "The ground acts like a blanket, keeping groundwater a constant temperature - around 20 degrees Celsius, or 68 degrees Fahrenheit. Surface water temperature changes with air temperature - in summer it is warmer than groundwater, and in winter it is generally colder than groundwater."
- Students complete the rest of the observations with their partner.

## **Damselfly or Dragonfly**

Damselflies look like a smaller version of a dragonfly, except their wings stand up on their back when at rest. Dragonfly wings remain outstretched when at rest. Both types of flies metamorphasize from a nymph to an adult fly. As adults, they fly over the creek and dip their tail in to the water and lay eggs. After the eggs hatch, the nymphs live most of their lives in the water. When fully developed, the nymphs climb out of the water onto a dry rock, climb out of their exoskeletons, dry their wings in the sun and fly away. Their presence indicates good water quality because of the length of their life lived in the water and their intolerance of a lot of pollution.

## **Erosion**

When a creek floods, the power of the water can wash away the streambank, leaving roots exposed and adding sediment to the creek. Too much impervious cover in a watershed (streets, parking lots, buildings) can increase flooding and as a result, streambank erosion.

## **Fossil of a Seashell**

Fossils of seashells indicate a sea used to be here millions of years ago. The sea was shallow and tropical. What was left of the ancient sea bottom formed limestone. (NOTE: FOSSILS SHOULD BE LEFT ON THE GROUND AFTER THE LESSON.)

## **Groundwater Springs**

- Discuss the flow of water: 1) rains at the top of the Bull Creek Watershed ; 2) water travels underground; 3) resurfaces again at spring; 4) flows into the surface water of Bull Creek.

## **Karstic Limestone**

Limestone that has holes in it that allow water to travel through easily. The Edwards Aquifer is made of karstic limestone.

## **Land Use**

- Give each student a “Bull Creek Land Use Map”. Ask students to locate where they are on the map. Use the map to identify land use north, south, east, and west of their location. Ask students to describe the kinds of pollution that could come from the different land uses. Focus on residential and what students can do in their neighborhood to help keep local creeks clean.
- Use the map to identify all the parks, preserves, and undeveloped land in the watershed. Most of this land is located next to the creek. Explain the benefits of undeveloped areas surrounding a creek. (Natural areas next to the creek are vegetative buffers which provide filtration of rainwater runoff before it enters the creek.) Bull Creek is protected by many preserves and generally has excellent water quality, which is important because it is a creek that flows into the Colorado River near our drinking water plant.

## **Limestone**

A shallow, tropical sea used to be here millions of years ago. What was left of the ancient sea bottom formed limestone. The creek bottoms in Austin are limestone, so the water is clear instead of muddy if the creek is healthy.

**Seed**

Seeds provide food for animals and continue a plant's life cycle.

**Sewer Line**

Sometimes sewer lines leak and cause high bacteria or an algae bloom in the creek, making the water unsuitable for swimming.

**Sign of a Flood**

Clumps of leaves lodged in trees or pushed up noticeably along the bank of the creek have been left by floodwaters. Creeks in Austin rise dramatically during heavy rainfall and subside within a few hours or days, depending on the size of the creek.

**Signs of Humans**

Did the sign left by the human impact the watershed for the better or worse, or leave it unchanged? Do you have a choice about how you impact the watershed?

**Something Edible**

A natural watershed provides natural sources of food. Native Americans and the early pioneers depended on these natural food sources for survival. The food we eat still comes from the watershed, but from a farm or ranch where the food has been cultivated.

**Something Prickly - Prickly Pear Cactus**

Identify the prickly pear. Discuss its abundance in our watershed and benefits as a food source. Cut one and let the students try it.

**Sounds of the Highway**

Although you are surrounded by woods, noises from the highway can disturb the peace for humans and some types of wildlife in the park.

**Tributary**

A tributary is a creek that flows into a larger creek or river. It adds water, and any pollution carried with it, from the tributary's watershed into the receiving creek.

**Waterfall**

Oxygen is circulated into the water by the bubbling of the waterfall, providing healthy habitat for water bugs, fish and other aquatic organisms.

**Watershed**

As long as you are on the land, you are on a watershed!

**Wildflowers**

- Encourage students to observe the variety of plants on the preserved watershed. Discuss how a native yard improves water quality because it doesn't require fertilizer, pesticide, or extra water. Plants also act as a filter for pollution. Encourage students to learn the types of plants native to Austin by using the wildflower identification brochure.
- If it is late winter or early spring and the flowers are not blooming, look for bluebonnet sprouts. Tell students the leaves of a bluebonnet form a five pointed star on each stem, just like the five pointed star of Texas. The bluebonnet is the state flower of Texas.

