ECOS
Ecologists Educators and Schools: Partners in GK-12 Education

ECOS Inquiry Template

1. CONTRIBUTOR'S NAME: REBECCA WAHL

2. NAME OF INQUIRY: WHAT YOU SEE AND WHAT YOU DON'T

3. GOALS AND OBJECTIVES:
   a. Inquiry Questions: What do you see/hear/smell/touch in your schoolyard?
   b. Ecological Theme(s): observation; patterns in nature
   c. General Goal: Understanding that observation is the first step in the scientific process
   d. Specific Objectives: Using all your senses (what do you hear, smell, see, touch?); using journaling to record observations; sitting quietly outdoors; generating scientific/ecological questions from observations
   e. Grade Level: 1-6
   f. Duration/Time Required:
      → Prep time: none
      → Implementing Exercise During Class: 30 minutes
      → Assessment: 15 minutes

4. ECOLOGICAL AND SCIENCE CONTEXT:
   a. Background (for Teachers): None
   b. Background (to present to Students): The first step in any scientific work is observation. We observe patterns in nature, interesting phenomena, weird and cool adaptations in animals—and that is the basis for asking questions and testing ideas. Today we are going to do some observing in the schoolyard, using many of our different senses: seeing, hearing, listening, and touching. We are going to work alone, recording our observations in our field journals, and then we'll get back together and talk about what we observed. While you journal, we want you to think about things you have questions about based on what you sense.

5. MOTIVATION AND INCENTIVE FOR LEARNING: This is a very open-ended inquiry, designed to help students get used to being outdoors to do science and think about the scientific process. It can be one of the first inquiries we do in the school year, and is designed to help students get excited about the scientific process and doing work outdoors. Students will (hopefully) be excited that they can choose what do write or draw—it's a creative process for them. And, they get to be outside, rather than writing in the classroom.

6. VOCABULARY:
Observation—The process of noticing things around you, by using your senses
Scientific method—This is the common sequence of steps by which a person conducts a scientific study or experiment. Steps include: observation, question and hypothesis generation, testing those questions, analysis of tests, and conclusions, which can lead to revision of hypotheses and further tests.
Sense—The way the body perceives something outside of itself. We commonly think of 5 senses in particular: sight, smell, hearing, touch, and taste

7. SAFETY INFORMATION:
Make sure students are journaling in a safe place and are not goofing off or doing anything unsafe during the exercise.

8. MATERIALS LIST (including any handouts or transparency masters):
Student field/nature journals
Pens/pencils

9. METHODS/PROCEDURE FOR STUDENTS:

a. Pre-investigation work: Students should have their own field journals that they have personalized. We can have a brief discussion on observation and how that fits into the scientific method (see "Background for students"). Students will be assigned to a certain "sense" by picking their "sense" out of the hat. We will focus on sight, sound, smell and touch. Students will also be assigned to different areas of the schoolyard (e.g. playfield vs. native plant garden), so that different ecological places in the schoolyard have at least one person observing each sense. Students will find their own personal space in the schoolyard within their designated area to do journaling.

b. Investigation work:

1) What evidence (data, samples) do students collect? Students will collect their own observations from the area of the schoolyard they choose to work in. Observations can be recorded as drawings, lists of words, or full sentences, which relate back to the sense to which they were assigned. The method of journaling may depend on the age of the students and the level of structure you wish to have in the inquiry. Students will pick an area in the schoolyard (within defined boundaries) within which to work. They will sit and quietly journal (no talking!) for 10-20 minutes in their area (depending on the age group).

2) How do students present the evidence (data)? After journaling is completed, we will have a discussion about what the students noticed while they were journaling. Students can share pictures they've drawn, the coolest thing they heard or saw, etc. We will have each student share at least one thing they observed, so that everyone has a chance to present their findings.

3) What conclusions are drawn from the evidence students collect? Most students will probably notice different things about their environments—some might notice birds, others the dirt or insects, and others plants, etc. Were there some general differences in what the students observed with their different senses? Did students notice more or less with certain sense than others? Were there differences in what students observed in different parts of the schoolyard? We all observe different things, and those differences are exciting, and the basis for scientific inquiry. What questions do the students have about what they saw? Can they think of questions they would want to answer using experiments?

4) Include examples of data sheets. Not applicable.

10. ASSESSMENT:
Did the students enjoy the journal time? Were they focused enough to get something out of it? Does the journaling exercise come back to the students in later inquiries? Do students recognize and remember observation as part of the scientific process?

11. EXTENSION IDEAS:
This exercise could be repeated from the same spot each season. Students could observe how things change in their "spot" each season—what is similar and different about what they're seeing in these areas throughout the school year? Do those similarities and differences lead to questions about what is going on in their environment?

This exercise can be an introduction to further journaling exercises throughout the school year. Students can be asked to journal before and after many of the inquiries they do throughout the year. They may also use their journals to record observations and help them generate hypotheses

during some of their experiments. In this way, this process will teach students about using journals and notebooks regularly in scientific work.

12. SCALABILITY

Journal time can be lengthened or shortened depending on the attention span of the age group. Journaling can be left open-ended or made more focused. Teachers may choose to have students write more, or leave it open for them to draw if they prefer.

13. REFERENCES: NONE

14. LIST OF EXPERTS AND CONSULTANTS

15. EVALUATION/REFLECTION BY FELLOWS AND TEACHERS OF HOW IT WENT:

We felt that the inquiry went pretty well. Our teacher (6^{th} grade) felt that the inquiry went well and several of the students told us that they enjoyed it afterwards. We had most of the students share what they observed, and the answers ranged from fairly simple lists of things observed to impressive and detailed descriptions of their observations. Also, a couple of the students really acknowledged the increase in things they observed when they took the time to do so.

There was a range of attention spans among the students during the inquiry. Some students were immediately engaged, while others were not prepared to sit still and journal alone. Overall, we found that we had to direct the children more than we had anticipated. We helped children think about how they would best detect and observe different senses, and talked many students through the inquiry and journaling exercise. Perhaps as expected, there were a few students who never really focused and got into the inquiry.

Generally, the whole inquiry was much more interactive between the fellows, teachers, and students than we had expected. However, our involvement, as well as the teacher's, did not take away from the inquiry. By helping the students think more carefully about how they observe and talking to them about it during the journaling process, I think we helped them record more detailed observations and think more about how to make good observations. Ideally, this will help the students with further observation-based inquiries and their role in the scientific process.