



Get Out!

A Guide To Doing Fieldwork

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Doing fieldwork can be one of the most exciting and rewarding parts of science. Fieldwork doesn't mean having to travel hours to some remote location. It can be as simple as stepping outdoors into your 'backyard,' traveling to a field study site in the natural environment, or going into the community to work with parks and recreation staff, zoo, aquarium or museum personnel, business people or government officials. *Get Out! A Guide to Doing Fieldwork* will give you the opportunity to connect with your local environment or community, gain different perspectives, meet new people, and practice various skills in the field.

Here are some simple, but important, things you should keep in mind when preparing to learn in the field:



1. Do some research on the location you will be visiting ahead of time so you know what to expect when you get there.
2. Make any contacts you need to complete your field study or community activity in advance of the trip. Set up necessary meetings as early as possible and be sure to find out if you need a permit to collect specimens or permission from local landowners to visit their property.
3. Make a list and check it twice! Give some thought to your plan before you leave and have the necessary equipment and supplies available so you are comfortable and prepared. Be sure to bring your field notebook and some pens and pencils so you can document your experience. Other items to consider include:
 - A clipboard
 - Sunscreen or protective clothing such as a hat
 - Insect repellent
 - Snacks
 - Water
 - Camera
 - Cell phone
 - A change of clothing (in case you get wet or muddy)
 - A first aid kit
 - A map or GPS unit if necessary
 - Any necessary field equipment
4. Test your field equipment before you go so you are sure it works – and that you know how it works. Expect things to get lost or broken in the field, and make sure you have a good low-tech back-up plan or extra equipment, especially batteries!
5. Check the weather and be sure you wear appropriate clothing for the day.
6. Make sure you are safe and comfortable in your outside learning environment. Scope out your options for bathroom facilities ahead of time. Understand and prepare for any potential hazards or challenges that you might encounter. For example, a trip to your local watershed is full of exciting learning possibilities, but if you plan to get wet (or even if you don't), you might want to bring a back-up pair of shoes and socks.



7. Schedule ample time for your field experience. Go during a time of day appropriate for the field work you are doing (e.g. during low tides if studying tide pools, or in the early morning if observing birds, etc.)
8. Be sure to tell someone where you are going and what your plan is for the day.
9. Reflect on your fieldwork before you leave the site and make note of any interesting findings or observations.
10. Evaluate your experience when you return indoors. Think about what went well and what didn't and document this in writing or on audio or video. Come up with ways to improve your future trips outside.

Approaches to Fieldwork (Methodologies)



Your approaches to fieldwork, also referred to as your methodologies, represent a set of methods or procedures that help you to interpret or solve problems related to a particular area of study. Different methods produce different results.

- **Qualitative methods** produce non-numerical, non-measurable values. Examples of qualitative approaches include descriptions or information gained through surveys or observations.
- **Quantitative methods** produce numbers or quantities. Examples of quantitative approaches include statistics or measurements such as size, weight, length, height, area, volume, speed, time, temperature, humidity, sound levels, ages, etc.



The types of methodologies listed below broadly represent the ones you are most likely to use for your Oceanscape Network *Get Out!* activities and all scientific inquiry projects.

Direct Observations: This is a very common method used for fieldwork. Direct observation uses all or most of your various senses. Observations are documented by describing, comparing, photographing or drawing what you see, hear, smell, touch, or possibly taste. Observation is a critical skill in the field; it is also pretty straightforward – just be curious. Do this by asking questions, looking carefully, keeping an open mind, trusting your senses, taking notes, and making comparisons among the different things you see.

Investigations: Here you will engage in specific tasks (e.g. making comparisons, measuring what you observe, or collecting samples) in an attempt to find answers to complex questions. You may have to speculate about processes that you cannot observe directly, making sense of it solely from the data. Measuring can include size, shape, number, or rate of various observations. If you have to collect samples in the field for later analysis and interpretation, be sure to collect only what you need for your research. It is not good field etiquette – and it can be bad for the environment – to collect large numbers of samples that you will only throw away later.

The two primary types of field investigations are:

- **Descriptive field investigations**, which involve describing and/or quantifying parts of a natural system (e.g., what plants and animals use a particular habitat?)
- **Comparative field investigations**, which involve collecting data on different populations/organisms, or under different conditions (e.g., times of year, locations), to make a comparison (e.g., what species of tree grows the fastest? How does temperature vary from one location to another?)

Correlations: This method involves measuring, testing, or observing two or more variables and searching for a relationship or pattern. When we know there is a correlation between two variables, we can make a prediction. For example, the owner of an ice cream shop may notice from his sales data that more people buy ice cream on hot days and can predict that warmer months of the year may have a positive impact on his business.

However, it is important to recognize that correlations often leave questions unanswered regarding the actual processes. It can also be difficult sometimes to know why things are correlated since many factors can enter into play. Examples of correlation research questions include: How do fall tree leaf colors relate to the number of sunny days in the fall? Or, how can cold weather cause damage to deciduous trees?

Monitoring (Assessing Change Over Time): To understand the progress or quality of one or more variables over a period of time, monitoring is required. Monitoring is the collection and analysis of repeated observations or measurements to evaluate changes in condition and progress toward a particular outcome. For example, resource managers may want to use monitoring to aid in decision-making tied to managing a particular plant species that is rare or vulnerable, or serves as an indicator or keystone species.



When studying change over time, it is often necessary to reconstruct the past by using secondary data (e.g., old maps or historical records). It may also involve finding places that are at different stages of development and, by comparing them, learning about the process of change they may go through. An example is the study of forest succession following a disturbance (e.g., fire, disease) by observing and comparing the change in distribution at several different plots that are similar but at different stages of the process.



Inquiry involves you, the researcher, directly in the research design. You develop the questions you want to answer, formulate hypotheses to be tested in the field, and select the field sites. You can use any of the methodologies (or combinations of them) listed above to investigate your inquiry question. Remember, the open-ended nature of inquiry fieldwork often leads to more questions.

Field Notes

Field notes are an essential part of fieldwork. Your field notebook, along with data sheets, can serve as a permanent record, kind of like a diary. As such, it serves as a memory aid, allows you to record changes over time (hourly, daily, seasonally, annually), and to record experiments, illustrations, photos, and other miscellaneous information. When you look back at your field notes later, you should know exactly what you did and observed on any particular day in the field.

If you keep regular notes over time, you may be able to detect patterns, allowing you to make predictions. For example, you may be able to speculate when certain animals will migrate or when particular plants will bloom, and your records should help you begin to explain why.

General Guidelines for Keeping Useful Field Notes

- Write legibly. You don't want to scribble your notes so quickly in the field that they are illegible back home or in the classroom.
- Record observations immediately (no matter how difficult the writing circumstances are); details are easily forgotten.





- Write down as much as possible. Don't hesitate to state the obvious, and be as precise as possible.
- Use sketches (regardless of your artistic abilities) and maps where appropriate.
- It is okay to rewrite field notes after the fieldwork is over if you want to add to your notes, make some conclusions, or simply clean up a messy page.
- Data collection in the rain or other inclement weather can be a challenge, so consider bringing an umbrella or a large plastic garbage bag or extra rain jacket to cover yourself and your notebook. There are also rainproof options for both paper and notebooks, but often these are more expensive. Regardless of weather, be sure that you are taking notes in the field and not completely waiting until you return or you will forget some important points.

Field notes vary in style and complexity. At a minimum, they should include the following three components:

- Field preparation materials, including maps, directions, research questions, etc.
- Data sheets. (*See the Oceanscape Network Outdoor Observation Worksheet*)
- Field notes, including date, time and place of observations; purpose of observations; details of observations and data collection samples; and sketches or photos, where appropriate. (*See How To Make Field Notes for more information.*)

What other kinds of information do you think you might keep in a field notebook? Consider the following questions before you *Get Out!*:

- What important information will you need to record about the site where you are doing your fieldwork?
- What kinds of information will you need to record about what you observe?
- What other information will help you to make sense of what you observe or help you to find patterns?
- What other information might you want to have when you look back at your notes after a week, a month, or a year?
- What is your research question? In other words, what do you hope to learn from your fieldwork? *NOTE: When you decide on your research question, write it down in your field notebook.*



In addition, write down two or three research questions that you might want to investigate later. The questions you ask here will guide your observations. And, remember, you can always change your questions or pose new ones as you learn more through your research.

- Have you generated a hypothesis, or an educated guess, to answer your research question? NOTE: You may want to find out more about your topic before you formulate a hypothesis. And, remember, your hypothesis may not be correct; just make the best guess you can based on what you know. You can always change your hypothesis as you learn more.



Creating Your Own Field Notebook

You may want to consider creating your own field notebook as opposed to buying something generic at the store. A field notebook is always a work in progress since you will add information to it for as long as you work in the field. However, there are some things you can do to get your field notebook started.

Decide what you will use for your field notebook. A binder to which you can add pages will probably work best. Remember, data recording worksheets are included for various Oceanscape Network activities, so using a binder allows you to include these printed worksheets in your field notebook.

Other options to consider include stapling the worksheets and blank pages together to create a notebook or using a ready-made notebook or journal and entering the worksheet data by hand. You can also create your own unique field notebook cover; be sure to include your name, grade, and school.

The Oceanscape Network also has a video on creating field notebooks – be sure to check it out!



Tips For Using Your Field Notebook

- Bring your field notebook each time you go into the field.
- The Oceanscape Network offers an Outdoor Observation Worksheet you can use to record your data, but you should also record the results from each of the activities in your field notebook and keep everything together in one place to make it easier to see how all the data fits together.
- Write everything down. Be sure to include lots of blank pages in your notebook, so that you can write or draw what you see, hear, smell, feel, or possibly even taste – but only if you know it's not harmful to you!
- If you visit a site more than once, make note of what you see that is new or different each time, such as a new or missing plant or different types of animals you encounter.
- Always record the date and time when you make an observation. It is also a good idea to record this information on every page of your notebook so you can re-order the pages if necessary.
- Record as much detail as possible. Remember, you want to be able to get good information from your notebook a week or month from now.
- Question what you see. As you observe, you may have questions about what you see. Be sure to write your questions down. Who knows, they may become the guiding questions for another field study!

Field Equipment

Fieldwork allows you to measure a variety of variables, such as population patterns, soil types, water quality parameters, weather or climate, topography, and land use. Some fieldwork requires little to no equipment, but at a minimum you will always need your field notebook and pens and/or pencils, along with appropriate data worksheets.

A key to planning your fieldwork is to make sure that you have the right equipment – in other words, will it measure what you intend to measure? And, does it work properly? Be sure you check all functions and batteries before you go into the field. In most cases, the Oceanscape Network will provide you with simple approaches for collecting your data. If you do need more specialized equipment, work with your teacher directly to obtain what you need for your research and to help ensure you are properly trained on how to use the equipment. If you are entrusted to use the equipment on your own, be sure you use it properly and carefully. Keep it clean (or clean it thoroughly after use) and save the batteries by turning equipment off when not in use.



Data Analysis

Your fieldwork doesn't end once you have collected the data and are back indoors. It is important that you take time to organize your data and process your findings – you can do this with your teacher, classmates, and/or your family members.

Soon upon your return from the field, review your field notes and data sheets, as well as any maps, sketches, or photos, and organize the data you collected. If you are planning to present your data – either as a discussion or in a written or poster format – you will need to make some preliminary decisions about what graphics, tables, or figures you might want to use. Numerical data is often first organized in tabular form; graphics help you and others visualize your findings.

The primary goal of data analysis is to make preliminary conclusions related to the research questions you posed at the beginning of your fieldwork planning. Where possible, compare your conclusions with previously researched data, preferably from the same field site. Once you arrive at your conclusions, pose some new questions and hypotheses for future examination.

Safety Considerations



Make wise decisions in order to avoid dangerous mistakes. Be sure to assess ahead of time the types of risk that might exist at your field site and take appropriate steps to minimize or eliminate them. When in the field, important items to have with you include a first aid kit (if you are allergic to stinging insects be sure to carry epinephrine), a cell phone (with emergency contact numbers), picture identification such as a driver's license, school or state ID card, sunscreen, insect repellent, proper footwear, and plenty of drinking water.



Before you head out, examine a map of the area and consider the type of roads or trails you will be traveling on and what condition they are in. The local Department of Transportation, Forest Service, Bureau of Land Management, or Fish and Wildlife offices are good sources of information. Remember that backcountry roads or trails may be closed to protect sensitive areas, for fire danger, or may be too rutted or washed out to be useable. Check ahead of time to make sure the road or trail you want to use is open. You should also consider what the topography is like in your field area. Is it rocky? Muddy? Forested? Be sure to wear the right shoes for your situation (e.g., solid hiking boots in steep or rough terrain).

Do your research ahead of time on the plants and animals you might encounter. Sporting goods stores and businesses which sell hunting and fishing licenses and gear, Forest Service, Bureau of Land Management, or Fish and Wildlife offices should have information on hazardous plants and animals in your area. In general, be careful of plants that have thorns and stickers, and learn to recognize poison ivy and poison oak so you can avoid it.

Animals may also pose dangers in the field, particularly if one perceives you as a threat. Always leave wild animals alone. Don't touch them, chase them or harass them in any way. Know how to recognize ticks and remove them safely, and be aware of poisonous spiders, snakes, scorpions and other creatures you may encounter in the field. You should also stay clear of cattle, as well as any feral or domesticated dogs, which can be territorial.

Does the rest of the world know where you are? Someone back home should know who is on the trip, where you will be going, when you are leaving and coming back, and how to contact you in an emergency.



Visit the Oceanscape Network EXPERIENCE features for additional information on safety, working outdoors, encountering wildlife and more.



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