THE IMPORTANCE OF FIELD NOTES

Field notes are the record of your work in the field. By "field" we mean any excursion outside of your home, office or school where you might have a need to study something. Field excursions allow scientists to gather information about their study subjects and to formulate and test hypotheses about the natural world. This process is the first part of the "scientific method."

Some scientists consider themselves field scientists" while others may be more productive in the laboratory or library. Chadron State College has a long tradition of contributions in the field sciences and students from many of CSC's natural science programs graduate with strong field skills. Areas in which field studies play a significant role include botany, geoscience (including paleontology), zoology, and range and wildlife studies.

Although field work is an indispensable step in the scientific process, it is expensive in terms of the investment of time and labor necessary to do it right. Typically you will drive many miles and spend several days under less-than-ideal weather conditions before you’re done. Once you complete a project you don't want to have to do it again. Time is money, as they say, and—especially if you are employed in industry—efficiency in the field will give you a reputation as an asset. The skill of taking good field notes is one of the most important skills you can develop to make you an effective field scientist.

So when should take field notes? In the ideal case, whenever you have an observation or have a question you should write it down. Having all of your thoughts in one place will eliminate the problem of where to look for them later. Strictly taken, then, your field notebook should never leave your side. Typically, you will take your field notebook on excursions made for the express purpose of gathering data. As a student you will take part in class field trips for which your field notebook will be a part of your grade.

Whatever their immediate purpose, your field notes are a form of communication. They communicate to your professor that you understand the situations you encountered in the field and can clearly describe them. They communicate to your fellow scientists that you have carefully collected repeatable observations that they can rely upon. And perhaps most importantly, your notes are a form of communication with yourself: no matter how clear and vivid your experiences are at the moment, you simply will not remember them with any detail tomorrow.

Your field notes will be your contribution to science, now and into the future. Your precise and complete notes might give some future scientist (and maybe yourself) insights that would otherwise be impossible. If you are ever called as an expert witness in a legal case, your notes can be considered a legal document. It is therefore important to get in the habit of making your notes clear, accurate, repeatable, and permanent.
TIPS ON GOOD FIELD NOTES

Note-taking can take many forms, from simple narrative to complex multi-page drawings. What form you use will depend on the situation, but you should also take advantage of your own skills. Whether you use narrative, sketches, photography or tables as your main form of note-taking will depend on what you feel most comfortable with. As your skill develops you should try your hand at other means of recording your observations.

Introductory Paragraph

Each day of field work, or each time you change to a new location or start a new topic, you should write a short paragraph that summarizes the reasons you are doing the field work, and some information that will help you remember the particular excursion. Your name and the names of other people accompanying you, the date, are essential. Brief descriptions of the weather or anything else that will help you remember the day are also useful.

Here is an example of an introductory paragraph:

2019-11-08, Toadstool Park area, Calcareous rocks project
Field Party: Seamus Heaney, Marisa Green, Harry Potter
Met rancher Bill Harmon at his house, 9:30 am, cell: (308) 555-4321
Weather: Overcast, 30°, Light wind from NW, roads slightly muddy from yesterday’s rain. Bill drove us in his pickup to what he calls the “west pasture,” (367,244mE, 4,746,392mN), where we began the morning transect.

Narrative

The simplest form of note-taking, and perhaps the one that comes immediately to mind, is narrative text. Your narrative might take the form of a sequence of prose paragraphs in which you write down what you see and think at the moment. While text may be suitable in some cases, in other cases it leads to long ramblings in which the actual information is hard to find. Sometimes narrative is necessary, but it may be more effective in combination with other note-taking methods.

Considering detail, it is tempting, especially when you’re rushed, to jot down, one- or two-word statements that seem to describe what’s going through your mind at the moment. The trouble with these quick notes is they may not make sense later. To avoid this problem, it’s a good habit to write full sentences. This takes more time to do, but it will save you having to revisit the site later.
**Sketches**

Much of what you do as a field scientist involves visual observation. Using words to describe what you see is often a good exercise, but making a visual copy—a sketch—is a more direct approach. Quite often sketching will force you to observe the situation more closely than you would otherwise. Sketching forces you to look at the details and to take the time to observe the parts and their contribution to the whole. For these reasons it is a learning experience.

A good sketch must be labeled. In almost every case a plain sketch without any descriptive text accompanying it is useless. You should also refer to sketches in any accompanying text.

Although some students complain that they "can't draw," even a poor sketch forces observation. And your drawing skill will improve with practice.

**Tables**

Some scientific data are best organized in a table. Are you traversing your study area by making observations at a series of collecting localities? Then perhaps a list of the collecting localities with columns for map coordinates (UTM easting and northing) and your data will serve most effectively. Where you are making the same set of observations or measurements at many localities, a table will make it easier for you to remember to make each observation at each place. Save a column in your table to refer to text, photographs or sketches on other pages of your notebook.

A table of contents may be a very useful tool to help you organize your notes. You can use a table of contents at the beginning of your field notebook (set aside several pages) or at the beginning of a major project.

Below is an example of use of tables in geology field notes.

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<table>
<thead>
<tr>
<th>Trench Azimuths</th>
</tr>
</thead>
<tbody>
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<tr>
<td>666.039</td>
</tr>
<tr>
<td>666.129</td>
</tr>
</tbody>
</table>

Conglomerate exposure, scattered boulders 1.2m across 0.5m thick

<table>
<thead>
<tr>
<th>EASTING</th>
<th>NORTHING</th>
<th>BEARING</th>
<th>THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>615.391</td>
<td>4737001</td>
<td>29° E</td>
<td>70°</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.5m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EASTING</th>
<th>NORTHING</th>
<th>BEARING</th>
<th>THICKNESS</th>
</tr>
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<tbody>
<tr>
<td>665.028</td>
<td>4737036</td>
<td></td>
<td>0.5m</td>
</tr>
</tbody>
</table>
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**Outline**

An outline is a hierarchical arrangement of ideas. Arranging your observations in outline form will force you to think about the relationship of your ideas to each other. You can use an outline
to set out your thoughts before you go in the field, say while reading the literature. You can then refer back to it while you take your notes in the field.

Photographs

Well-done photographs can be very effective in conveying your field experience to a reader. To do so, though, they need to go somewhat beyond the intent of a simple "snapshot." Even if you carry a portable printer with you in the field and paste photos in your notebook at the spot taken, you still need to record the location precisely. Do this so that someone else could relocate the exact spot and retake the photograph. A GPS unit helps with this.

Photographs should usually contain a scale—some recognizable object to help viewers see the size of your subject. A very effective scale can be made by calibrating your field notebook itself: neatly draw some 1-cm bars on its cover. Or calibrate a larger object such as a hammer or shovel handle.

Photographs cannot replace your written notes. Besides the location of each shot, you will need to write down why you took each photo, and something about its subject. Getting prints of your photos to paste in the notebook should be done as quickly as possible before you forget why you took them. Making annotations on the photographs—arrows, lines, labels—is often a useful way to communicate what you saw.

Maps

A map is often necessary in a field project to show collecting localities or relationships among studied phenomena. It may be helpful to include a map at the start of a project in the field notebook. A simple hand-sketched map may suffice; a photocopy of a USGS quadrangle or a map custom made with GIS may also be used. Be sure to include a scale.

FIELD NOTES STANDARD

The following Chadron State College field notes standard was developed to clearly lay out the expectations of student field notes. These guidelines should help you get the most out of your field excursions. If made part of regular practice, they will help you become a better field scientist.

1. USE SI UNITS

The International System of Units (SI) should be used in measurements. Exception: since most vehicles in the US have odometers calibrated in miles, road distance may be given in miles.

2. MAKE YOUR NOTES PERMANENT

Notes should be in a permanent form. Pages should be hard bound with waterproof paper. Notes should be taken using permanent black ink. Pages must be numbered consecutively so that the order of notes could be determined if pages were removed. If you're really serious about your
contribution to posterity, you should take your notes on acid-free archival paper using permanent ink such as India ink.

3. **USE YOUR NOTES TO COMMUNICATE AND INFORM**

The notebook should tell the reader all he/she needs to know to understand what you did and why you did it. You should assume zero knowledge of your subject or your study area on the part of the reader of your notes. Observations should be quantified whenever possible. For example, “Sixteen of 35 measured cobbles were crystalline quartz; 12 chert, the rest red quartzite.”

4. **RECORD YOUR OBSERVATIONS**

Field notes are a record of your observations in the field. Besides your personal observations you might find it useful to include other information, such as the observations and opinions of others.

5. **MAKE YOUR FIELD EXPERIENCES REPEATABLE**

Anyone should be able to follow your notes and easily return to the places you went and see the things you saw. Assume zero knowledge on the part of your reader: be explicit about details such as road numbers, miles between stops, and direction to and distance from local landmarks.

6. **INSIST ON ACCURACY**

Information should be correct, accurate, and as unbiased as possible. Describe conditions under which observations were made and how you took any measurements. If possible make repeated measurements.

7. **ATTRIBUTE YOUR SOURCES**

Any items included in your notes that are not purely your own contribution should be attributed to their source. This includes information compiled from published sources (cite as you would in a scientific paper) and the thoughts of other students or your professor.

8. **USE VISUAL AIDS**

Sketches and other visual aids should be used and should contribute significantly to the scientific value of the notes.

9. **ORGANIZE YOUR NOTES**

Your notes should be organized so that a reader understands the connection between localities and their descriptions. To keep sections of the notes from running together into one long list, use paragraph headings to announce new locations or topics. Refer between narrative and other parts of your notes. Annotate your photographs to make the connection to localities and descriptions.

10. **FINISH WHAT YOU START**

Is everything there? This includes your name, the date(s), record of everything done, specimens collected, photographs, etc. Do these checks before leaving one locality and moving on to the next.