The only difference between *screwing around* and *science*, is writing it down.

- Mythbusters
The importance of taking notes

Notes are:

- a physical, direct record, an “academic diary.”
- a process to organize your thoughts, record of thought process
- a reason to really think about your observations
  sketching/writing forces thought
- a memory device to “put you back out there”

WRITE EVERYTHING DOWN!
Important things to include

*in rough order of importance*

Location

Sketch/photograph
  - Perspective, orientation, *scale*

Relationships between units

Unit descriptions

*Aide memoire*
  - weather, mood, people on trip/you meet, plans, etc.
  - not derogatory…

Measurements/sample/photo details

Interpretation
Organization

**Book front:** contact info, reward, build-as-you-go Table of Contents

**Site ID:** YYYYMMDD-# (or .#, or 00#)

**Header:** Location (GPS or written details), Weather, *Aide memoire*
- Daily objective/key questions addressed/fieldwork goals
- Logistical details (e.g. station manager ID, directions, map)

**Observations:**
- Site significance (e.g. west limb of large anticline - broadest scale)
- Sketch + label or list primary units (outcrop scale)
- Unit description (i.e. hand sample scale)
- Relationship between units (stratigraphic/tectonic, etc)
  - May include smaller-scale detailed sketches/graphic log/photos
- Measurements/photo/sample details
  - Sample ID = site ID + Letter
  - Keep a running table of Samples, measurements, photos in back!

**Interpretations:**
- Short paragraph that cites observations specifically (use symbols/color)
Objective: solve mysteries of the universe
Visiting 5 sites along a road in the middle of nowhere

Observations
Site significance

List primary units: A, B, C... see sketch
A - description
B - description
C - description

Relationship between units (stratigraphic/tectonic, etc)
   w/ detailed sketches/graphic log/photos

Measurements/photo/sample details
Sample ID = site ID + Letter
Keep a running table of Samples, measurements, photos in back!

Interpretations:
Short paragraph that cites observations

Sketch map
Placing sites in context
And relative position to middle of nowhere
Title of sketch w/ units labeled

Detailed section along line

too busy... ~1-2 sketches/page
Compton's example - narrative
WRITE EVERYTHING DOWN!

DO IT
Sketching

Sketches are worth > $10^3$ words

sketching requires careful observation

include a scale!
Sketching - keep it in 2D

can be hard to draw accurately

scale/measurements!

easier to capture detail
Sketching exposures

keep it 2D... just add perspectives

Sasseville et al., 2008

draw major contacts/structures **first**
distinguish units (*color is better*), list units separately in notes
gradually layer on details, e.g. smaller structures within units, weathering
plot locations of samples/measurements/detailed sketching
helpful to annotate a photograph from the same perspective afterward
APPENDIX 2. Abbreviations of Geologic Terms

Abbreviations for nouns are capitalized to distinguish them from adjectives (see, for example, dolomite and dolomitic). For a more extensive list, see Mitchell, J.G., and Maher, J.C., 1957, Suggested abbreviations for lithologic descriptions: Bulletin of the American Association of Petroleum Geologists, vol. 41, p. 2103-2107.
WRITE EVERYTHING DOWN!
Other perspectives
I'm putting together some notes for my field geology courser on how to take good notes and keep an organized field book - any tips from the twitterverse?
I usually write notes on the right-hand pages and draw my corresponding sketches on the left-hand pages of field notebooks. Also, it can be really helpful to use repeated, simple symbols to represent certain things.

For example, when I take pictures, I draw a rudimentary camera (box with a circle in middle), then put the initials of whoever took the picture, and then the numbers corresponding to those pictures. That makes it really easy to link photos to notes once I’m back from the field.

Oh yeah, and I have a key for all my symbols, usually on the back page of the notebook, so that anybody who reads it can figure out what the box with a circle in the middle means!
Tiny little thing but I always write some note at the top of the page like my mood and weather (or song I have stuck in my head). Those help a lot to remember that particular day months or years later.
Kathy Benison  @KathyBenison · 6h

Replying to @iamskeptikarl @GeomorphicJosh

I encourage my students to write questions in their field notebooks. For me, that helps record my thought process and helps me focus on making observations that help lead to answers. It also gives me permission to re-evaluate and not be overly wed to one view.

Karl A. Lang  @iamskeptikarl · 13m

agreed! when I have time I like to start a field day this way: summarize key questions over coffee, it helps to keep the rest of the day focused
Kathy Benison @KathyBenison · 6h
Replying to @iamskeptikal @GeomorphicJosh
I also suggest summary pages. If I’ve spent several days collecting lots of data, I like to put it into a summary table or to make notes to sum up important observations or thoughts.

Ryan Ickert @RyanIckert · 4h
That’s so useful. I try to do a daily summary that includes information about how the day went (weather, access, people...) and it will help jog my memory later on.

Karl A. Lang @iamskeptikal · 9m
good point. sometimes writing this information is better AFTER the day is over rather than BEFORE, since things can change rapidly once you take that first page of notes...
Final one- sketches are awesome. But they need to be BIG, and if you're going to sketch, put enough time in to actually make it worth it and show something. USE A SCALE (duh). If no sketches, get a scheme to link photos to book, and describe what's in the photo in detail.

1:07 AM - 19 Feb 2019

@Siccar_Point is on point, and I want to emphasize sketching. They should be required, > 1 a day. No smaller than 1/2 page to allow for detail AND annotations. I see so many good observations without context. Sketching forces one to slow down, think clearly, and connect the dots.

1:30 AM - 19 Feb 2019
WRITE EVERYTHING DOWN!

♪ This is how we do it. ♪
Ryan Ickert @RyanIckert · 4h
Replied to @iamskeptikarl
I make a dry-erase whiteboard on the back of my field book by taping thick, transparent, plastic film over white paper. I'll write info on the white-board that ties the photo to the note book, and then capture the whiteboard in the photo.

Ryan Ickert @RyanIckert · 4h
If it's obtrusive (e.g., a picture from a long distance) I'll take two photos, one with the white board and one without. The info on the board varies - sometimes it's a station number, or a sample ID, or just GPS co-ordinates and the direction I'm facing.

Karl A. Lang @iamskeptikarl · 9m
small hard dry erase boards can also be great for taking strike/dips. I also use hand symbols to keep photos organized in a pinch, but the white board approach is key.
Time stamps to connect photos to notes
Always be prepared to describe where you are in words if GPS is unavailable/inaccurate (#gorgeproblems)
Related- iPad note taking is life changing

7:54 AM - 19 Feb 2019

I'm all for paper notes: If you are using electronic notes or placemarks on your phone or other connected device, make sure cloud backup is actually happening at the end of each day. I got into serious trouble with this last year.

8:39 AM - 19 Feb 2019
I think for people new to taking good field notes its important to learn to separate observations from interpretation. When jumping to interpretation before writing down ALL observations the interp can be wishful thinking ... Took me a while to learn this :)

10:08 AM - 19 Feb 2019
Maybe a controversial one- don't be afraid to break the rules. Better to have a thought or observation not in the correct format than not at all. Systemised observations (i.e., data) => systematised formatting. Let the rest slide...
WRITE EVERYTHING DOWN!
Notes from a master
This is my field book.
There are many like it,
But this one is mine.
My field book is my best friend. It is my life.
I must master it
As I master my life.
Without me, my field book is useless.
Without my field book, I am useless.

Map on, Sister
Map on, Brother
Tips from a master

WRITE DOWN EVERYTHING - there is no "later"

Always write down your notes, at least some of them, with a writing utensil. If you must be fully digital, I suggest you write a narrative after each trip (a trip report). It will prod your mind and will actually enrich your life years down the road.

We evolved to write with our fingers or a little stick. It is an appendage to your brain. I learned this for sure when my daughter Tessa told me (when she was 4): "Daddy, when I push down hard enough on the crayon, I can see what I'm thinking." Typing notes or choosing options from pick-lists leads to shallow and rushed thinking. It is a major commitment to write notes down, but it is a critically important exercise.

Always write field station coordinates down no matter how else you store them. Whenever I don't do this, I tend to regret it once back in the office. Even writing coordinates on sample bags is a good idea. If appropriate, write the sample number and the coords on a card to put in the bag.
Tips from a master

Draw simple orientation symbols in your field book when you take a measurement and make sure it looks the way you expect. I learned this the hard way.

I faithfully use Rite in the Rain [sweat] field books. I have recently found that the pencils they make are also useful, particularly the erasers. Mechanical pencils with 0.7 to 0.9 mm are best. Seem fat, but work great on the Rite in the Rain paper.

The ultra fine point sharpie (not the sharpie 'pen') are great for enhancing sketches in those field books, but the tips get wonky if you don't work them a bit on normal paper every now and then. Normal sharpies make bold lines for large schematic sketches, but make a mess with finer sketches.

Always carry colored pencils to make your sketches better. Sometimes I excel at that, sometimes I fail. My go-to pencil is the one. Worth every penny, promise. At a minimum, color your sketches in the comfort of your home, tent, or truck.
Tips from a master

Remember to write down something notable (e.g., funny, stupid, really weird, or otherwise) that will help you remember that exact day when you were out taking the notes., e.g., I was nearly murdered; I saw a venomous snake; it was insanely hot and I hallucinated; my truck got stuck; I broke my leg falling off an outcrop (that happened to you, right?); I left my truck's door open and went on a 3 hour traverse; we had an awesome dinner; I saw a spiritually epiphanic sunset, etc.  

Never assume you will return to a particularly informative place. Take the damn notes!

Develop a solid field station numbering scheme and live with it no matter what your colleagues might have to say about it. When I have altered mine in the past (typically for brevity), it has only created confusion later in life. Mine is MMDDYY##

Your field notes, narratives, and journals are you. Your field books may prove very useful to other geologists, and could be valuable to your family. My grandfather was a geologists and I would give a kidney for his notes.
This is my field book. There are many like it. But this one is mine. My field book is my best friend. It is my life. I must master it as I master my life. Without me, my field book is useless, without my field book, I am useless.

Map on, Sister
Map on, brother
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Phone: 928 556 7179 / 928 221 7778

Project: Lower Colorado River Corridor
     Geologic Mapping
     pkhouse@inreach.garmin.com

Rite in the Rain — A patented, environmentally responsible, all-weather writing paper that sheds water and enables you to write anywhere, in any weather. Using a pencil or all-weather pen, Rite in the Rain ensures that your notes survive the rigors of the field, regardless of the conditions.

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<td>3-7</td>
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US Pat No. 6,863,940
8-14

IMEL - 3-004346-0952740
Crow.ryan@inreach.garmin.com
Color main units/features!

- Forsets
- River sediment (delta)
- Pillow lava
- Lava delta
- Flow breccia

Entablature

Colonnade

Devils Thrance approx.

Cooling front

Culls from margins

Not to scale... at all!
**Intracanyon Lava**

**West Crater** - 70 Ka

**Saddle Butte** - 145 Ka

**Clarks Butte** - 815 Ka

**Deer Park** - 780 Ka?

**Bogus Rim** - 1.7 Ma

- Basalt lava
- Lava delta
- Lake deposits
- Fluvial deposits (old)
- Rhyolite

**Interpretation**
Observations

The Thog here is syn Bouse overall it carries and hosts the branching tufa. — erodes, carries and hosts tufa and also O abundant tube contents and is strongly oolitic.

Complex shore and fan interaction. multiple tufa beds seen, 3 fan remnants (this being #3)

Interpretation

Observations

01141/634 — 3kt. 33.31750 114.81200 211m
Less inclined to flat (?) tufa bed forming tension pattern here.

01141/625 — 33.31464 114.81738 225m
Platy Thot under much gravel cover here.

01141/626 — (13°) 33.31455 — 114.818176
Tufa bed under cover here.

01141/627 — (80°) 33.31455 — 114.818176
Similar to #22. More over yellow soil into tufa, some big tufa heads up slope, involved with gravel at top

Underlying Conglomer and Thot dipping more steeply than wash.

01141/623 - 33.31703 114.81219 210m
Inclined linear Thog that daylight here.

Symbols

decent text spacing
station ID

<table>
<thead>
<tr>
<th>120 81/619</th>
<th>370</th>
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</table>

elevation

120 81/620

GPS

much of this spine is Tfs, but the knobs are mainly Tcb. Tfs is rolling Coarse xtaline granite, I think the side slope of the knobs that host much Tcb may belong to a Tcb paleochannel? (I can't believe I really could drive in here. There is one really steep uphill to deal with.)

composite interpretation

Tcb! astep 4.5m or Tcb here. Can see thick mantle trending 280° - 280°

No Tcb on large wall of Tfs to my north.

END OF DAY
lines separate stations

end of day
Other people’s notes:

- Nunkivak Normal
- Idignial Normal
- Thvera Normal
- Mio-Pliocene / LCR Sand

Joe and Ryan found small lens of possible tephra. Very slight dip if any, between 0-3° to NW.

Sample on N bank or wash 13.7 fm of Tdc

Joe’s HPA casts also 3.48 m tephra above top in wash on bench.

Tdc or Tcf

Possible / approve 20 m higher in section:

- 400 m HD between both sites
- 20 m vert sep

Considerably traceable on north bank.
mood/weather

Hot soaked and squelched between 11 and 12.

0331804 - Been here way back in 2014.
Reformed Tbos overlay here by fan gravel.
Fan gravel no CR yet.

7m

Green mud

34.48463 -114.45331
Lots of contrary dips measured most pervasive one.

02231805 - Bruce mud and fine sand
Slightly deformed capped with fan
Starting a redder then typical soil. It is
beneath a ~1m thick younger Q dep.
34.48484 -114.45456

02231806 - Tbos dipping opposite of Site 4
Contact with Q dep Chance here by heavy
inlaided Sandstone. Strong ANG UNC.

02231806.1 - 124 to 023 m Tbos
34.484849 -114.45522
WRITE EVERYTHING DOWN!