ASBOG Fundamentals of Geology Study Hints - November 10, 2011

Daphne M. Jones, P.G., R.S.M
Senior Geologist
Duncklee & Dunham, P.C.
odaphne@gmail.com

Considering a Career in Geological Sciences?

- There are still jobs for geology majors, even with the economic downturn.
  - Oil & Gas and Minerals Exploration
  - Environmental jobs – consultants, state & federal government
  - Geological engineering
  - Academic research/Teaching

Undecided about ASBOG FG Exam?

- I recommend that you go ahead and take your Fundamentals of Geology (FG) exam.
- Find a study partner or organize a small study group.
- Start early, study several times a week over at least several months; cramming will not work.
- Memorize important information and equations over time – you won't be able to take programmable calculators or take any reference material into the exam with you.

Resources

- Refer to your textbooks and internet resources.
- Work the most common types of problems over and over. Three-point problems have many applications in different subject areas.
- Take practice exams
- EIT vs. GIT prep courses – no multi-evening offerings for geologists-in-training (GIT) exam. Plenty of offerings for engineers in training (EIT) exams.

ASBOG® Site

- http://www.asbog.org/
  - Great source of information. I'd look at most every link on this site.
  - Candidate handbook has tips and sample FG questions
  - Link to 2010 Task Analysis gives a FG test blueprint.

Fundamentals and Practice of Geology Test Blueprints

Content	FG/PG %	Content	FG/PG%
General/Field Geology	20/21	Structure, Tectonics, Seismology	11/9
Mineralogy, Petrology, Geochemistry	11/5	Hydrogeology	11/19
Sedimentology, Stratigraphy, Paleontology	12/5	Engineering Geology	11/17
Geomorphology, Surficial Processes, Quaternary Geology	13/8	Economic Geology and Energy Resources	11/16
		Total	100/100

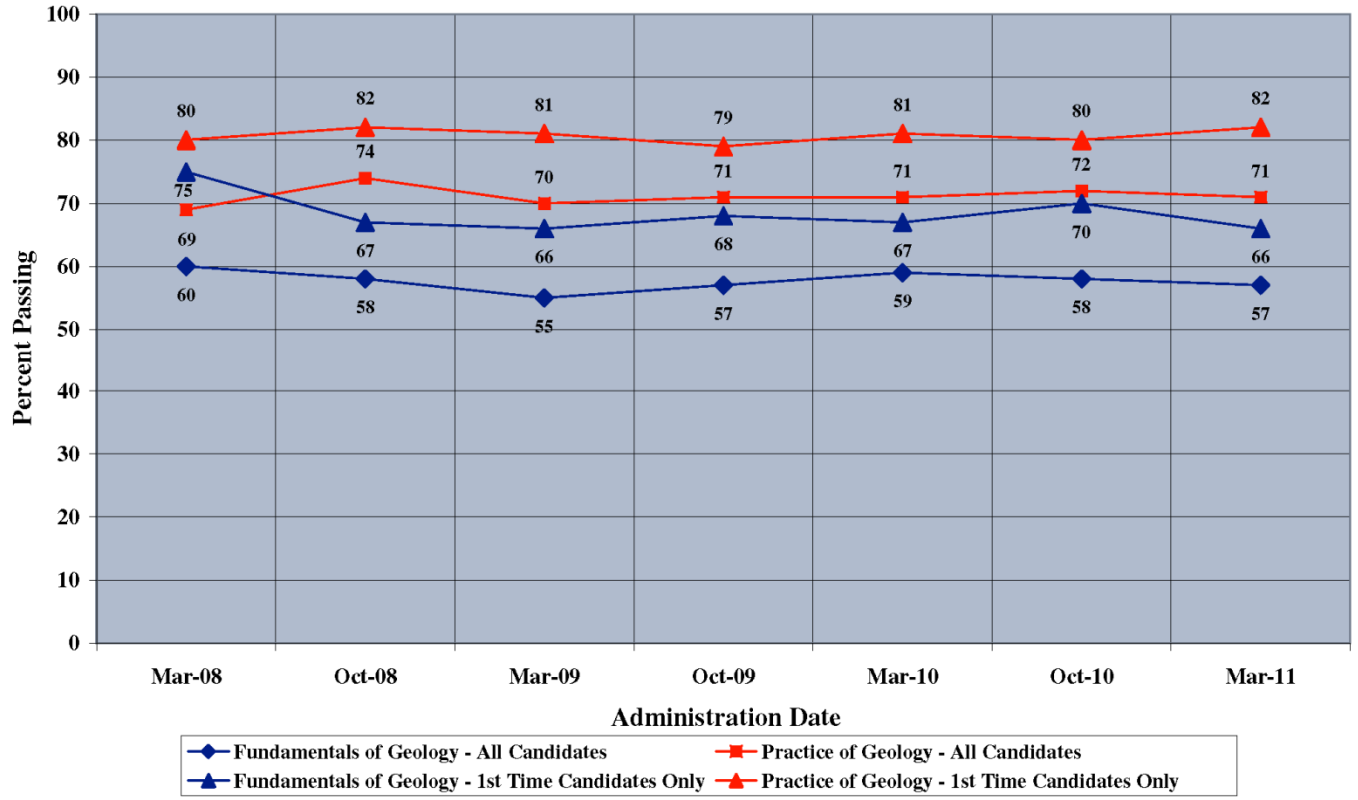
From ASBOG® Professional Geologists Candidate Handbook

FG = Fundamentals of Geology exam (Requires 30 semester hours in geological sciences.)

PG = Practice of Geology exam (4+ yrs experience as GIT (geologist in training)

ASBOG® FG Passing Rates

Figure 2
ASBOG® FG & PG Examinations
Passing Rates by Administration
1st Time Candidates vs. All Candidates
(March 2008 - March 2011)



Study Guides

- Reg Review http://regreview.com/
- Raleigh course on January 22, 2012 $495 + $16 shipping
  - http://www.regreview.com/studyaids2011.html
  - $125 for Study Manual – has problems at the end of each chapter
  - $35 for Practice Quizzes
  - $155 for both
  - Flash Cards $28 – make your own!
  - Some practice materials on their website

Pennsylvania Council for Professional Geologists (PCPG)

- PCPG offers one and two-day courses for FG/PG review. I took the 2-day review in Feb 2011.
- Review materials are included with course registration, but not available separately.
- One day review for FG, one for PG (back-to-back). $299/$559.
- In Pittsburg PA February 2-3rd , 2012.
- http://www.pcpg.org/

Other Sources

- Mometrix Media – http://www.mo-media.com/asbog/ ASBOG Exam Secrets - $50. How to take a test good. Other sources better for technical review areas.
- http://www.georev.com/services.htm offers ASBOG pre-tests for $50. Study manuals for $90 (e-copy). Haven't actually seen products, but it says it contains 1,400 Q&A in all topics.
- I found the Reg Review manual/practice exams to be more beneficial than my PCPG two-day course with handouts (some PCPG's materials of were electronically delivered on a thumb drive).

Costs Associated with FG Exam

- Prior to ordering the exam, there is an application with a $55 fee. The form includes recommendations and transcripts as well. Applications must be received 75 days prior to the exam (March 2nd would mean around December 15th).
- Exam must be ordered by January 13, 2012. That cost is $180 for the FG.

Equations

- Put the main ones on flash cards and memorize them.
- You may receive information in a question that that can be used to solve in another unrelated question later in the test.
- You often have to use more than one equation to calculate the answer to a problem. For example, Darcy's Law and the Velocity Equation.

  Q = KiA and Q = Av

  You may only be given enough information such that you have to use both equations to solve the problem.

Units

- Know the units for equations (e.g. transmissivity in gpd/ft or ft^2/day), measures volume of water flowing through 1-foot aquifer thickness. Hydraulic conductivity is gpd/ft^2 and measures the volume of water flowing through a 1 x 1' cross section.
- Keep your units straight during conversions; write it out to make sure that you can cancel out everything except the final answer. This is when knowing what the units are will help you. Some of the wrong answers in the exam are based on common conversion errors.

Questions on the FG

- 140 Questions, 4 hours is ~ 1 minute 40 seconds per question.
- Eliminate obviously wrong answers and mark those off in the test booklet. Then, if you are stumped, go to the next question.
- Go back and finish the skipped questions at the end, even if you have to guess. There is no penalty for a wrong answer. This is why you marked the wrong answers earlier; to give you better odds.
- Wear a watch and be aware of the time without obsessing on it.

Logistics

- The closer you can sit to the front of the room the less people there will be in front of you fidgeting/ speeding through the test or exhibiting other annoying habits in your line of sight.
- Earplugs are good to have if you are easily distractible.

Logistics – cont'd.

- Bring a silent, non-programmable calculator, 360 °protractor and engineer scale. A rolling ruler, compass and a few colored pencils may also be useful. The graph paper in the test booklet isn't the best.
- Only one person allowed to take bathroom break at a time; you don't have time to waste, so forgo coffee prior to test.

What kind of learner are you?

- **VISUAL**
- **AUDITORY**
- **KINESTHETIC**

Of course we all learn by all of these three styles, but usually have a preference.

VISUAL

- Numerous detailed notes
- Tend to sit in front of class
- May close eyes to visualize to remember something
- Benefit from illustrations/presentations using color
- Attracted to written/spoken language rich in imagery
- 40% prefer this style

AUDITORY

- Sit where they hear but needn't pay attention to what happening in front
- Often hum or talk to themselves
- Acquire knowledge by reading aloud
- Remember by verbalizing lessons to themselves – these are the students that like to tape the lecturer
- 20-30 % learners prefer this style

KINESTHETIC

- Need to be active and take frequent breaks. Sit near door or someplace else where they can get up and move around.
- Speak with their hands, with gestures
- Remember what was done but have difficulty recalling what was said or seen
- Find reasons to tinker, move or doodle when bored
- Learn best from what they can directly experience or perform
- Enjoy field trips and tasks involving manipulating materials
- 30-40% of learners prefer this style, yet it is usually the least used teaching style.

Studying for FG Exam

- Use your own style of learning to prepare
  - Visual learners may want to have a white board to write things over & over again.
  - Auditory learners may want to record information they read out loud and play back to themselves.
  - Kinesthetic learners – Visual aids or props are for important for learning.

Studying for FG Exam - cont'd.

- Study consistently (several days a week) over a several month time period.
- There is way too much information to cram at the end.
- Take sample tests offered by guidance materials offered on ASBOG website or in purchased study materials.
- Meet with your study group on a regular basis.
- Use the internet.

Important Topics

- The ASBOG® Professional Geologist Candidate Handbook lists the Knowledge Base and Task Statements.
- Rules of V (six cases) important in deciphering geologic maps. Know them.
- Geologic Timescale – I memorized and regurgitated it as soon as I started the test. It can help you with other questions (e.g. age-dating techniques, geologic map interpretation) throughout the test.

Important Topics to Study -2

- Familiarity with **geophysical methods** and their strengths and limitations (seismic – reflection/refraction; gravity, magnetics, resistivity, borehole geophysics.). Ditto for different types of **remote sensing** and what they are used for.
- **Field geology**, especially if you didn't take a field geology course. Interpreting geologic maps – know symbols, rules of V.

Important Topics to Study -3

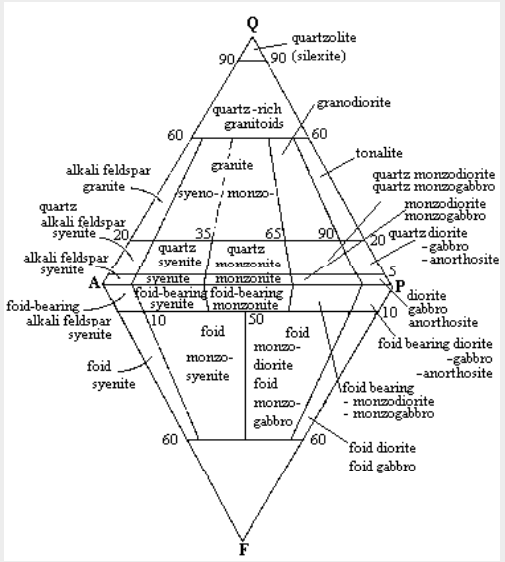
- There are a number of questions relating to **hydrogeology**. Know your equations.
- **Structural geology, plate tectonics.** More big picture than minutia. For instance, you won't have to construct a stereonet, but you need to know how basic structural features appear on a stereonet. What igneous and mm rock are associated with different plate types/boundaries.

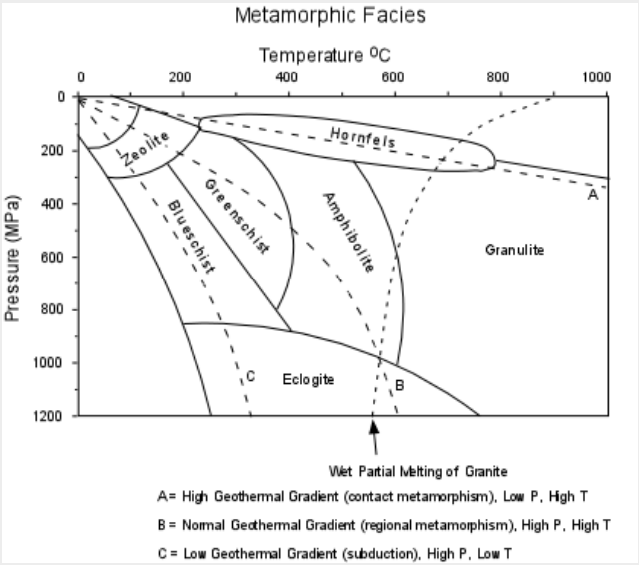
Important Topics to Study - 4

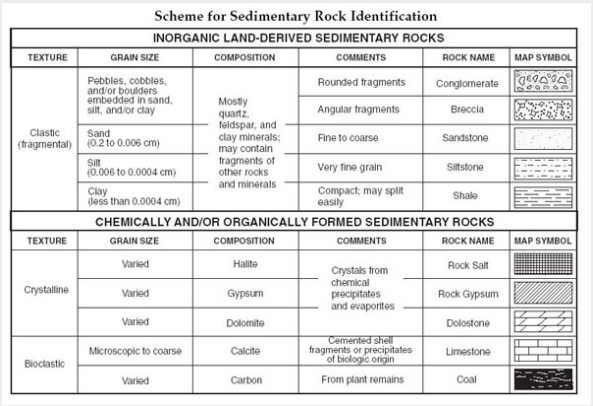
- **Economic geology** – minerals: type of ore body classifications. Oil and gas: trapping mechanisms. Coal – ranking information.
- **Engineering geology** – soil properties, classification (Unified, Wentworth), slope stability, Atterberg Limits, mass movement. Equations for water content, void ratio, bulk density, dry density, etc.

Important Topics to Study - 5

- **Petrology** – Igneous, metamorphic and sedimentary rock classifications and associated mineralogy.







Scheme for Sedimentary Rock Identification

INORGANIC LAND-DERIVED SEDIMENTARY ROCKS					
TEXTURE	GRAIN SIZE	COMPOSITION	COMMENTS	ROCK NAME	MAP SYMBOL
Clastic (fragmental)	Pebbles, cobbles, and/or boulders embedded in sand, silt, and/or clay	Mostly quartz, feldspar, and clay minerals; may contain fragments of other rocks and minerals	Rounded fragments	Conglomerate	
			Angular fragments	Breccia	
	Sand (0.2 to 0.006 cm)		Fine to coarse	Sandstone	
	Silt (0.006 to 0.0004 cm)		Very fine grain	Siltstone	
	Clay (less than 0.0004 cm)		Compact; may split easily	Shale	
CHEMICALLY AND/OR ORGANICALLY FORMED SEDIMENTARY ROCKS					
TEXTURE	GRAIN SIZE	COMPOSITION	COMMENTS	ROCK NAME	MAP SYMBOL
Crystalline	Varied	Halite	Crystals from chemical precipitates and evaporites	Rock Salt	
	Varied	Gypsum		Rock Gypsum	
	Varied	Dolomite		Dolostone	
Bioclastic	Microscopic to coarse	Calcite	Cemented shell fragments or precipitates of biologic origin	Limestone	
	Varied	Carbon	From plant remains	Coal	

Summary

- Everything listed in the ASBOG handbook will be covered, so everything is important. You won't know what is on the exam until you take it, and you want to be prepared.
- Statistically speaking, your best chance for success is your first time you take the exam with the caveat that you have adequately prepared for it.

Summary – cont'd.

- Don't wait. It will only take more time to prepare later, once your coursework is a distant memory.
- If you plan to go to grad school, the FG exam has replaced what used to be called the advanced GRE.
- If you pas you will be a GIT and halfway thorough the ASBOG exam requirements as well. No annual fees until you pass both exams.