Key to Homework Problem
The History of a Structural Block Diagram

One of the major tasks of a geologist is to reconstruct the sequence of events which makes up earth history. The only evidence we have to do this is that preserved in the rock record. To do this exercise you must draw on all the geologic knowledge you have gained so far.

The key to the structure block diagram for the homework is on the next page. Note that you will have a problem similar to this on the final exam. It will be simpler than the homework problem. You will be expected to place the rocks in order of formation, and to explain why they come in the order they do using the kinds of evidence listed below.

(1) Recognize and identify geologic structures, (faults, unconformities, etc.)
(2) Interpret the historical meaning of specific rock types from your knowledge of how they formed.
(3) Logically arranging geologic events in sequential order (by superposition, cross-cutting relations, etc.)

LOOK SPECIFICALLY FOR THE FOLLOWING FEATURES IN THE CROSS SECTION.

SEQUENTIAL EVIDENCE

- Superposition (which unit sits on which unit?)
- Cross-cutting relationships (what cuts what? LIST ALL!)
- Original horizontality (or lack thereof)

STRUCTURES

- Faults (be sure to name which kind)
- Folding events (indicate how you know it occurred)
- Unconformities: Be able to name what kind!

INTERPRETATIONS MADE FROM SPECIFIC ROCK TYPES

- The type of rock that is present can give you information about certain geologic events.

KEY - INSTRUCTIONS - KEY

- ❒ For **every** rock unit listed, name the specific evidence by which we know that the rock formed next (put this on the line directly opposite of the rock name).
- ❒ **IF** another event occurred to the rock **after** it formed, **but before** the next event or rock, describe it on the next line.

EVENT OR EVIDENCE	**Rock Units** (in sequential order)
SUPERPOSITION - E is on bottom of stack	Unit E - Schist and Gneiss
NONCONFORMITY - Sed rock H sitting on gneiss\schist E	
SUPERPOSITION - H lies over E	Unit H - Quartz Sandstone
SUPERPOSITION - I lies over E	Unit I - Shale
SUPERPOSITION - J lies over I	Unit J - Limestone
DEFORMATION/EROSION - H, I, J no longer horizontal, but C, G, F not folded; ANGULAR UNCONFORMITY with A and B	
CROSS CUTTING - C cuts E (and metamorphoses H/I) but is itself cut by D and F and overlain by B.	Unit C - Diorite #1
CONTACT METAMORPHISM - H becomes quartzite (H') and I become hornfels (I') by intrusion of C	Unit I'- Hornfels and Unit H' Quartzite
CROSS CUTTING - G cuts E, H, I, J and C, but is cut itself by D and F, and lies under B	Unit G - Granite
CROSS CUTTING - D cuts E, C, and G, but is itself cut by F and normal (back corner) and thrust faults	Unit D - Diorite #2
THRUST FAULTING by CROSS CUTTING - fault cuts E, G, and D, but not F	
NORMAL FAULTING - D is cut by fault in the back corner (by implication fault comes after all previous rocks)	
CROSS CUTTING - F cuts D, C, and G, (and everything before) but is not cut by the thrust fault [1]	Unit F - Basalt
NONCONFORMITY - intrusive dike F lies under sandstone B (also G and C eroded too; thus H, I, and J eroded twice)	
SUPERPOSITION - B lies on top of E, H, I, J, C, and F; and CROSS CUTTING - B cuts across normal fault	Unit B - Clean Sandstone
SUPERPOSITION - A lies on top of B	Unit A - Shale

[1] It is conceivable that F came before the normal fault, or is simultaneous with it, but there is no direct cross cutting evidence to tell which came first. They are both tensional events implying they may be simultaneous.