

Phylum Arthropoda

Specimens 7-1: Specimens include: *Homotelus bromides* (Ordovician); *Elrathia* sp. (Cambrian); *Peronopsis interstrictus* (Cambrian)

Specimen 7-1a: This trilobite is said to be “enrolled”. Why is this a good term to use?

_____ [2 points]

Why is enrolling a useful attribute for trilobites? _____

_____ [3 points]

Why are trilobites classified in the same phyla as insects? _____

_____ [3 points]

A possible internet research question: What was the mode of life of the trilobites? Make sure that you address all of them.

_____ [5 points]

Phylum Hemicordata

Specimen 7-2 contains graptolites representing the two major orders. (Actually there are 2 sets of samples [7-2a and 7-2b] in separate boxes)

To which order does graptolite 7-2a belong? _____ [3 points]

To which order does graptolite 7-2b belong? _____ [3 points]

What is the mode(s) of preservation of these beasts? _____

_____ [3 points]

Another possible internet research question: What was the mode of life of the graptolites?

_____ [5 points]

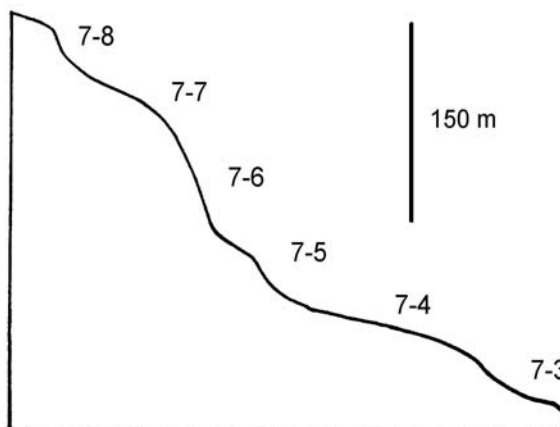
Part Two: Stratigraphy

Colorado Rock Suite: Hey, this is a true story. Two world renowned geologists (Doug Haywick and David Allison) were driving along a road climbing up the Rocky Mountains in Colorado when they really should have been getting bored in a geology conference in Denver. All of a sudden, they came across **outcrop**. No real surprise; it was the Rocky Mountains after all. Well our two geologists stopped and examined the rocks. They even collected some specimens. After a while, they got back in their car and continued driving. A bit later, different rock! Another stop, another specimen. By the time they made it to the top of the road, they had stopped 7 times and collected 6 rocks (one stop was a bathroom break). The cartoon below is a profile of the mountain face that they were climbing with the location of the rocks that were collected. Assume that there is a geological contact between each of the rock types and that those contacts are horizontal.

Question 1: Fill out the rest of this table by identifying the types of rocks that were collected and the dominant minerals that comprise them [26 points].

Rock #	Age	Rock Name [3 points each]	Depositional Environment [2 points each]
7-3	Pre-Cambrian	Granite	
7-4	Lower Cambrian		
7-5	Lower Cambrian		
7-6	Lower Cambrian		
7-7	Mid Cambrian		
7-8	Mid Cambrian		

Question 2: Now complete the stratigraphic profile using the correct lithological symbols for the rock types that you identified above. Use a straight line between sample number locations to show contacts between rock types and also use the correct fill symbols for the rock types that you identified in question 1. Don't forget to use the correct line symbol for the unconformity between rocks 7-3 and 7-4 [5 points].



What specific type of unconformity must lay between rock unit 7-3 and 7-4?

_____ [3 points]

Given the vertical transition of rock types and depositional environments that you identified in questions 1 and 2, what must have happened to the area from the time of deposition of rock unit 7-3 to 7.8? This is one of those annoying and possibly tricky thinking questions. Ask for help if necessary.

_____ [5 points]

Western Canada Rock Suite: These rocks were collected in and around Banff National Park, one of Canada's greatest natural reserves. Here you will see amazing scenery, plants, animals and of course, geology. The rocks that occur here are economically important elsewhere in the province of Alberta. Specifically, they produce enormous quantities of petroleum and natural gas. The questions that follow ask you to consider both the origin of the rocks (e.g., depositional environments) and oil production.

Specimen 7-9: Devonian Leduc Formation (Banff National Park).

This is the new rock that you were warned about earlier (dolostone). It's pretty non-descript and very difficult to tell apart from a fine-grained, non-crystalline limestone. So the question is, what's the best test to use to distinguish between this dolostone and a non-fossiliferous limestone?

_____ [3 points]

The color of this rock is a bit misleading. Most rocks of this type are light grey or white. Why is this one so dark? (Hint: powder or scrap a bit of the rock and sniff it)

_____ [3 points]

Name: _____

Specimen 7-10: Devonian Leduc Formation (Banff National Park).

What name would you apply to this rock? _____ [2 points]

Petroleum geologists love to find this type of rock below the surface because of its high porosity. Why?

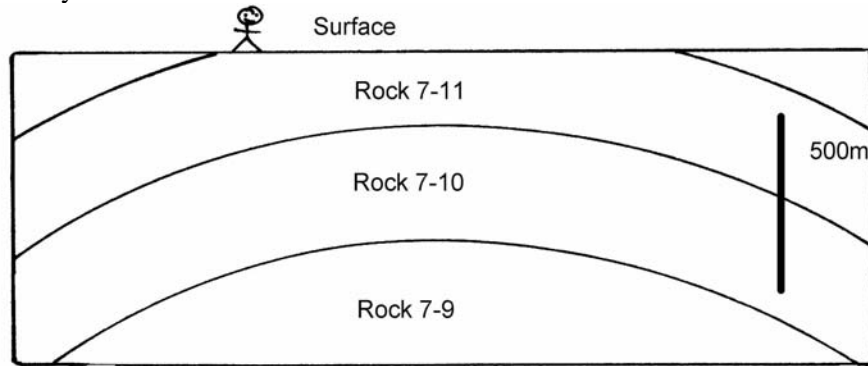
_____ [4 points]

Specimen 7-11: Devonian Leduc Formation (Banff National Park).

How does the porosity of this rock compare with specimen 7-10 (i.e., does it have higher, lower or the same amount of pore space?)

_____ [2 points]

The three rocks are found within different intervals in the Leduc Formation. When they occur in the following sequence associated with an anticline, petroleum geologists get excited. Why?



_____ [5 points]