

## Geological Mapping Exercise 8 - Answers

Refer to the geological map supplied on the last page of this exercise.

1. What is the geological character of the following boundaries? Give a reason for your answer in each case.

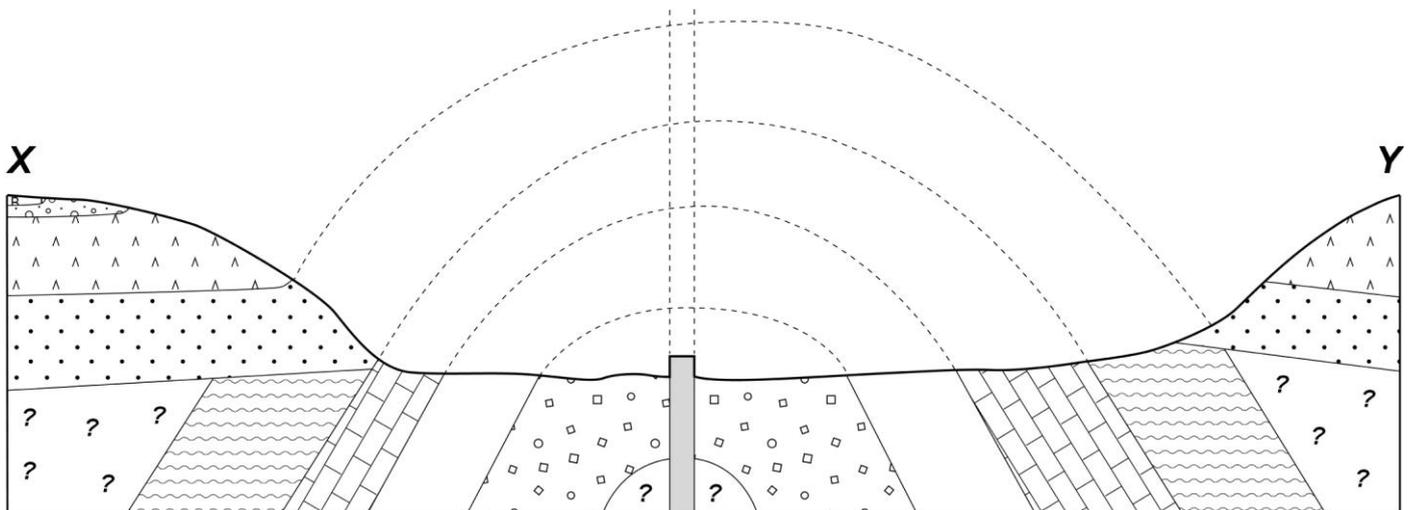
a) AB: unconformity (angular or nonconformity – sedimentary rocks overlie older igneous – not for whole AB though)

b) CD: unconformity (angular – tilted sediments overlain by near horizontal)

c) EF: fault (horizontal displacement)

d) GH: dyke (dolerite – wall of magma)

e) IK: intrusion (contact metamorphism at boundary)



2. Construct a geological section from X to Y.

3. If EF is vertical, what sort of movement has occurred along this boundary?

Strike-slip

4. Name the most likely metamorphic rocks to be found close to the boundary with the granite.

Marble (contact metamorphism of limestone) and quartzite (contact metamorphism of well sorted sandstone)

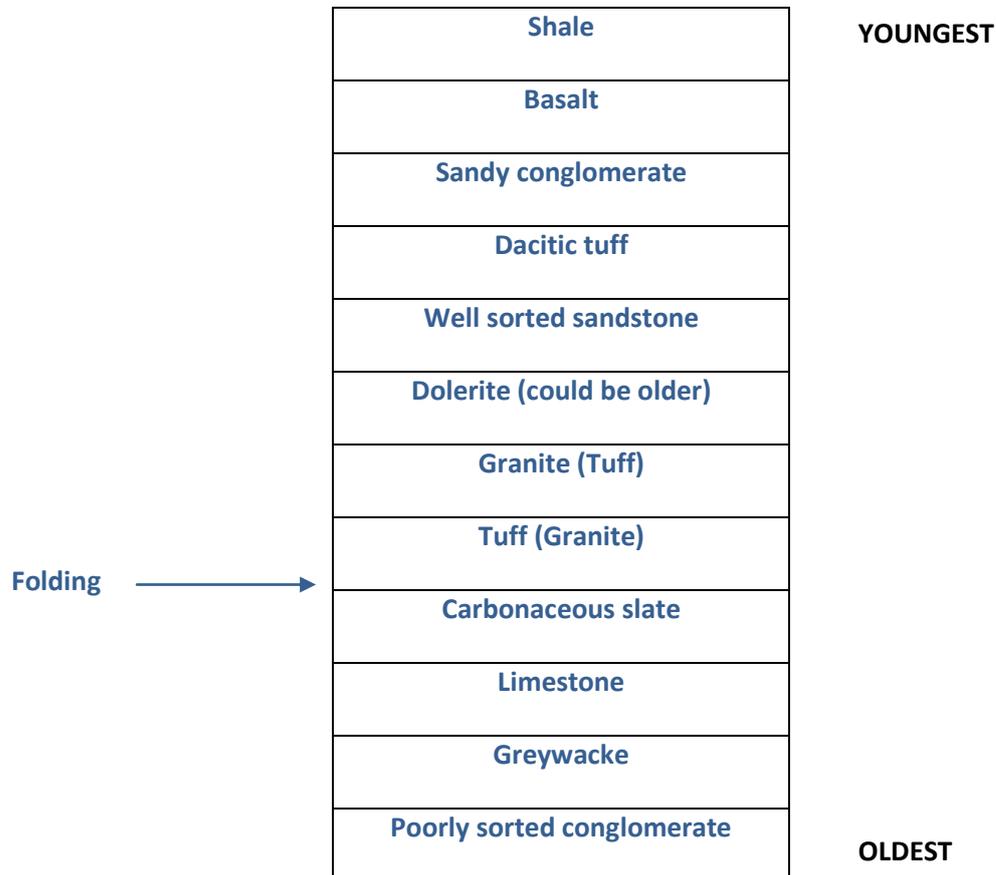
5. The basalt is between shale and sandy conglomerate. How could you tell whether this is a flow or a sill?

By dating the rocks to give absolute ages or looking further afield for cross cutting relationships

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6. List the rock types in order of formation. Use the stratigraphic column provided.



7. A greywacke is a poorly sorted mixture of angular and rounded fragments in a muddy matrix. Explain the changes that would have occurred in the environments of deposition between the greywacke, conglomerate and limestone.

The poorly sorted conglomerate was likely deposited in the upper section of a river system, where the water is flowing quite fast, to transition into greywacke the river may have slowed down (to allow deposition of mud) and for limestone become a coastal area, so perhaps this reflects transgression (encroaching) of the sea).

8. Write a geological history of the area.

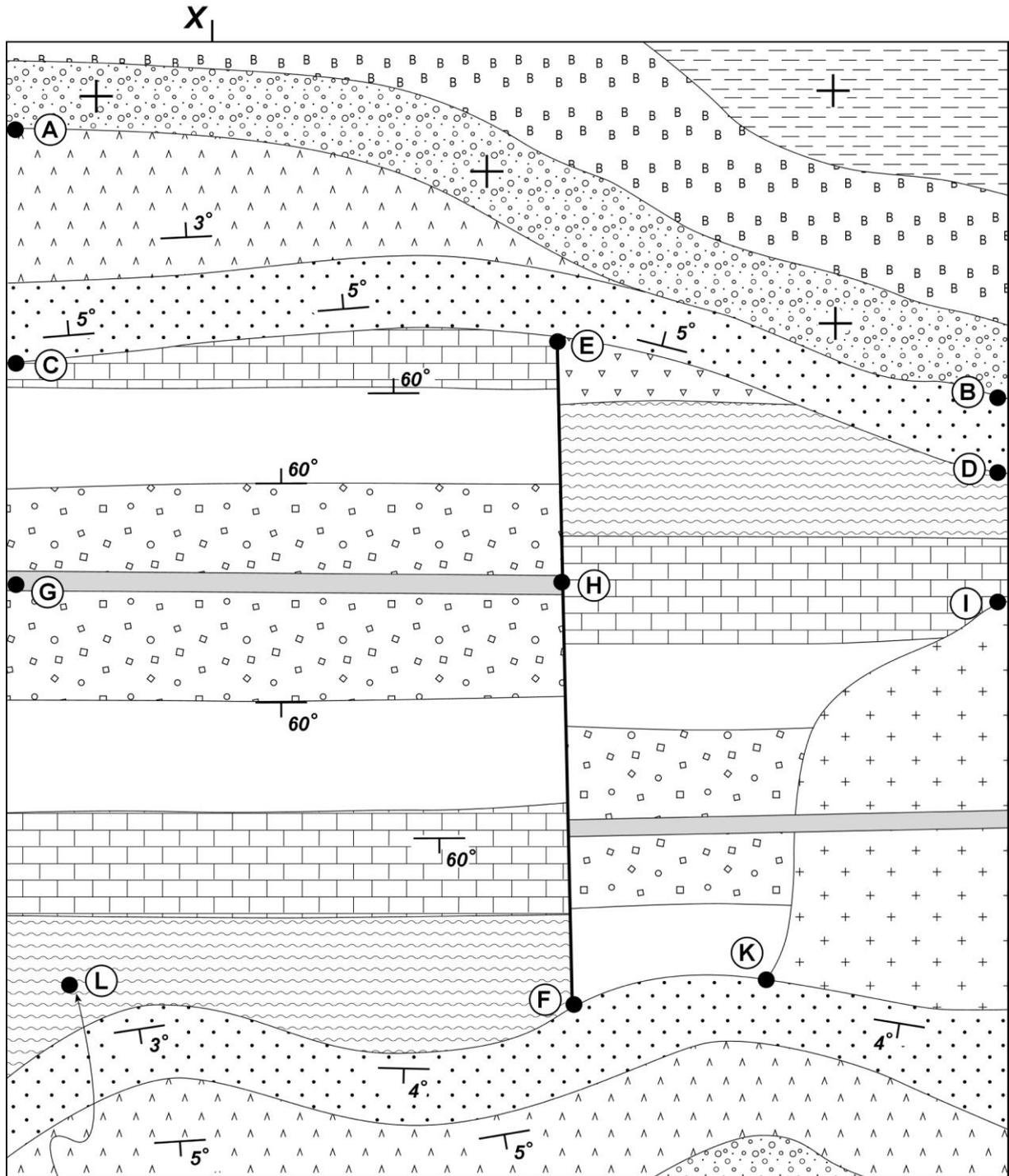
The sediments for poorly sorted conglomerate, greywacke, limestone and carbonaceous slate were deposited and formed into rock (with mild metamorphism for the slate). These were then folded. Volcanic activity in the region allowed for the deposition of tuff and intrusion of granite

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and dolerite. This was followed by deposition of well sorted sandstone which was partially buried by a dacitic tuff. Further deposition occurred, with sandy conglomerate which was buried by a basalt flow and this was covered with deposition of a shale. Weathering and erosion is occurring at the present day surface.

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fossil found at L

**N**

	Well sorted sandstone		Granite		Poorly sorted conglomerate		Horizontal bedding
	Dolerite		Tuff		Sandy conglomerate		40° Dip of bedding
	Carbonaceous slate		Greywacke		Dacitic tuff		
	Basalt		Shale		Poorly sorted limestone		