GCE MARKING SCHEME

SUMMER 2018

GCE (LEGACY)
GEOLOGY - GL2a
1212/01

INTRODUCTION

This marking scheme was used by WJEC for the 2018 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

GCE GEOLOGY - GL2a (LEGACY)

SUMMER 2018 MARK SCHEME

Specimen A = Red Sandstone

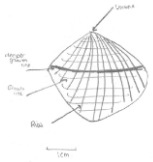
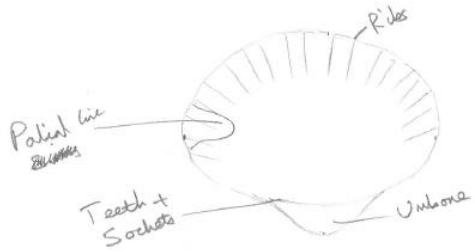
Specimen B = Cockle

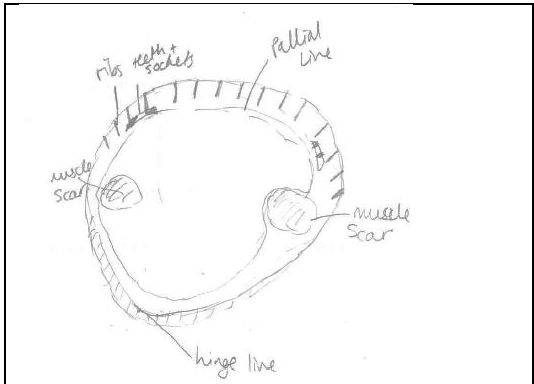
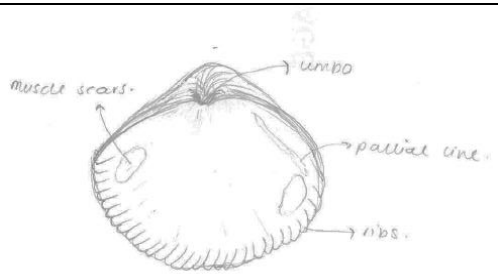
Specimen E = Bioclastic Limestone

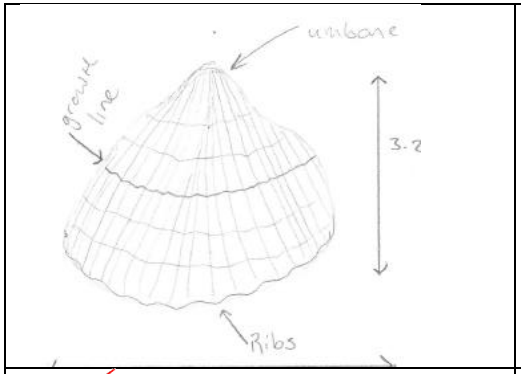
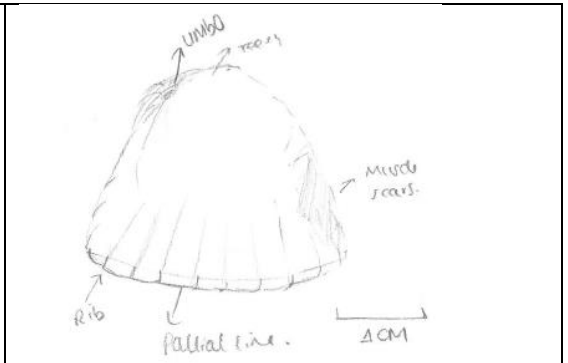
Q1	Marks	Expected Answer	Acceptable Answer	Do Not Accept
(a)	(3)	• Well Sorted • Porous • It is the product of Aeolian processes		• If more than 3 boxes are ticked, deduct 1 mark for each box which is wrongly chosen to a minimum of 0
(b)	(4)	• Quartz R • Cannot be scratched with a steel pin • Haematite • Red in colour	• No cleavage Or Colourless Or Vitreous Lustre • Cherry Red Streak • Accept Feldspar instead of haematite. If feldspar identified then accept, 2 cleavages, white/pink colour.	• Has a hardness of 7, any reference to density or streak • Any reference to density or hardness
(c)	(1)	• North-East		
	Total 8			

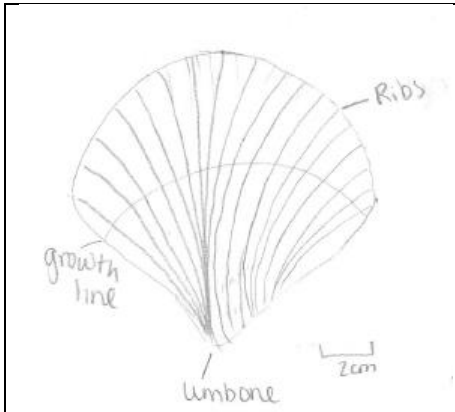
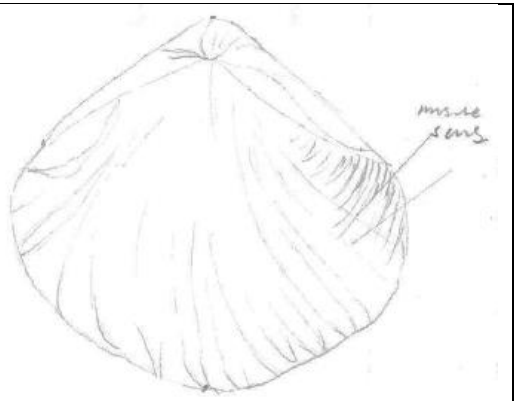
Q2	Marks	Expected Answer	Acceptable Answer	Do Not Accept
(a)	(4)	Award 1 mark for each of the following, see attached marked examples • (Sc)Suitable scale so that drawing nearly fills the box. • (Sh) Correct shape • (D) Detail of any 3 of the following **internal** features drawn on the diagram; Ribs, Umbo, Teeth, Sockets, Muscle Scars, Ligament Pit, Pallial Line, Grooves • (L) 2 named hard parts, any 2 of the following; Umbo, Teeth, Sockets, Muscle Scars, Ligament Pit, Pallial Line, Dentition, Crenulated Margin	• A maximum of 3 marks to be awarded if an external view is drawn • A correctly named right or left valve	• Any hard parts not appropriate to this fossil group e.g. foramen, brachial valve, suture line etc
(b)	(2)	• Bivalve • No plane of symmetry that bisects the valve	• Allow for correct recognition of symmetry even if the fossil group is incorrect • Presence of any of the following; Ligament Pit, Pallial Line, 2 adductor muscle scars only, teeth and sockets	• Any other fossil group • Any reference to equivalve

Q2	Marks	Expected Answer	Acceptable Answer	Do Not Accept
(c)	(3)	• Recognition that they formed at different times in different environments • Rock Unit B is unconformable to Rock Unit A so not formed at the same time • Rock Unit A is a desert sandstone and Specimen B is a marine fossil so formed in different environments	• Rock Unit B cuts Rock Unit A OR B is horizontal and A is dipping	
	Total 9			

	
Scale ✗ Shape ✗ Detail ✗ (no marks as external view) Labels ✓	Scale ✓ Shape ✓ Detail ✗ Labels ✓ (3 correct, 1 incorrect = 2 correct)

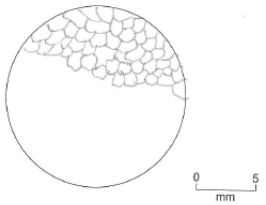
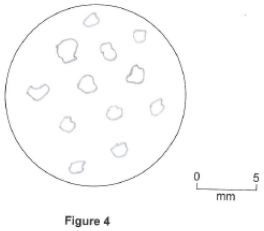
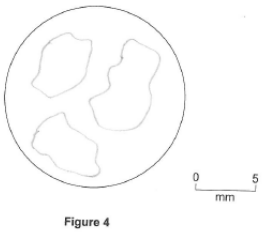
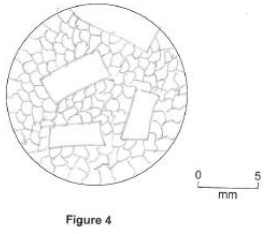
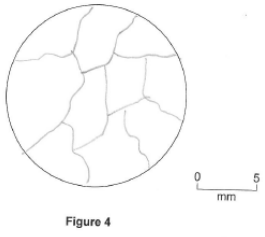
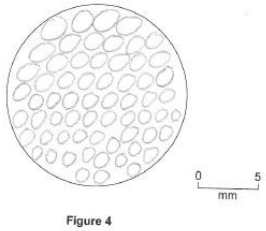
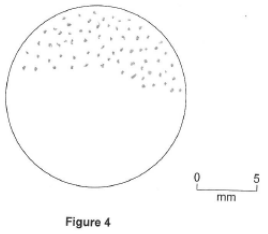
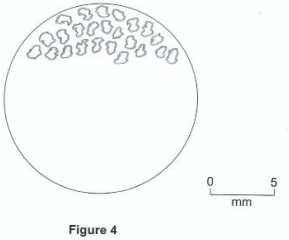
	
Scale ✓ Shape ✓ Detail ✓ Labels ✓	Scale ✓ Shape ✓ Detail ✓ Labels ✓

	
Scale ✓ Shape ✓ Detail ✗ (no marks as external view) Labels ✓	Scale ✓ Shape ✗ Detail ✓ Labels ✓

	
Scale ✓ Shape ✗ Detail ✗ (no marks as external view) Labels ✓	Scale ✓ Shape ✓ Detail ✓ Labels ✗

Q3	Marks	Expected Answer	Acceptable Answer	Do Not Accept
(a)	(3)	• Pluton box ticked Any 2 of the following: • It is discordant • It has a metamorphic aureole • It is over 500m in diameter	• Credit correct reasons even if the incorrect box has been ticked • It cuts the bedding • It has metamorphosed rock units D or H • It is large	• Do not award 3 marks if the pluton box is not ticked • The question asks for **Map** evidence only so do not credit evidence from photograph 2 e.g. it is coarse grained, it is porphyritic etc.
(b)	(2)	• Structure M is part of the country rock • Incorporated into rock unit C during the intrusion of rock unit C	• M is a xenolith/ included fragment • Reference to assimilation or stoping	• Any reference to erosion
	Total 5			

Q4	Marks	Expected Answer	Acceptable Answer	Do Not Accept
(a) (i)	(1)	• Calcite	• Calcium Carbonate	
(a) (ii)	(1)	• Oolitic Limestone		• More than 1 box being ticked
(b)	(3)	Please see marked examples • (C) Crystalline • (Sh) Shape - **not rounded** • (Si) Size - All crystals are a similar size **and** greater than 0.5 mm	The drawing does not have to fill the entire circle	• Grains that show no contacts with any other grains ie all grains are floating
(c)	(1)	• Marble		
	Total 6			

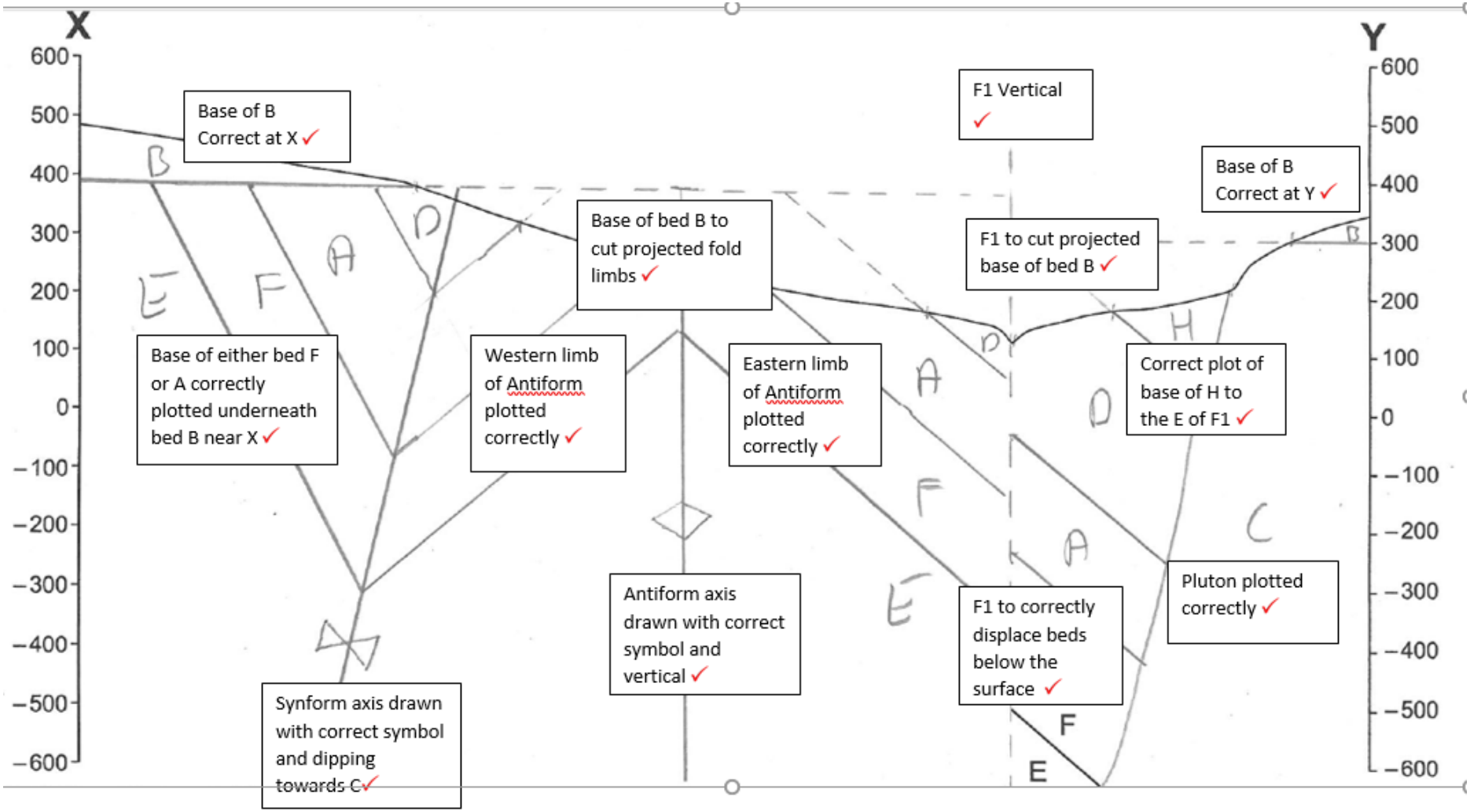
	 Figure 4	 Figure 4	 Figure 4
Crystalline ✓ Shape ✓ Size ✓	Crystalline ✗ Shape ✓ Size ✓	Crystalline ✗ Shape ✓ Size ✓	Crystalline ✓ Shape ✓ Size ✗
 Figure 4	 Figure 4	 Figure 4	 Figure 4
Crystalline ✓ Shape ✓ Size ✓	Crystalline ✗ Shape ✗ Size ✓	Crystalline ✗ Shape ✗ Size ✗	Crystalline ✗ Shape ✓ Size ✓

Q5	Marks	Expected Answer	Acceptable Answer	Do Not Accept
(a)	(1)	• 100m (unit must be present for the mark to be awarded)		• Any other answer than 100m
(b)	(4)	• F1 Dip Slip • as the base of Rock Unit B has been vertically displaced • F2 Strike Slip • as no vertical displacement of the base of Rock Unit B across F2 or Offset of F1	Allow the evidence mark even if the incorrect fault type box has been ticked	
(c)	(2)	To gain full marks there must be recognition that the statement is incorrect • Cannot assign a side as being either a hanging wall/footwall • So cannot be classified as normal/cannot classify fault	An implication that the statement is incorrect • Doesn't dip towards downthrown side • Accept it is impossible to tell for 1 mark • It could be a tensional/extensional fault because beds have downthrown	• The fault is vertical without ref to hangingwall/footwall • The "student is wrong"

Q5	Marks	Expected Answer	Acceptable Answer	Do Not Accept
(d)	(5)	• G in top box • B in second to top box • F1 older than F2 • F1 and F2 between G and B • F in bottom box	• Award 1 mark for B in top box and G in second to top box • Award this mark providing F1 is shown as older anywhere on the column	• F1 and F2 being shown as the same age
	Total 12			

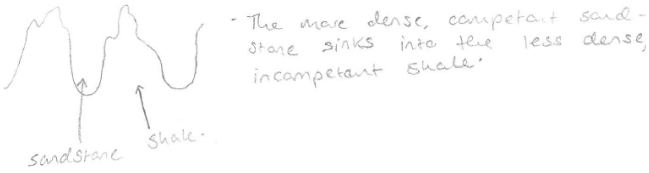
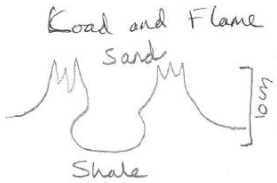
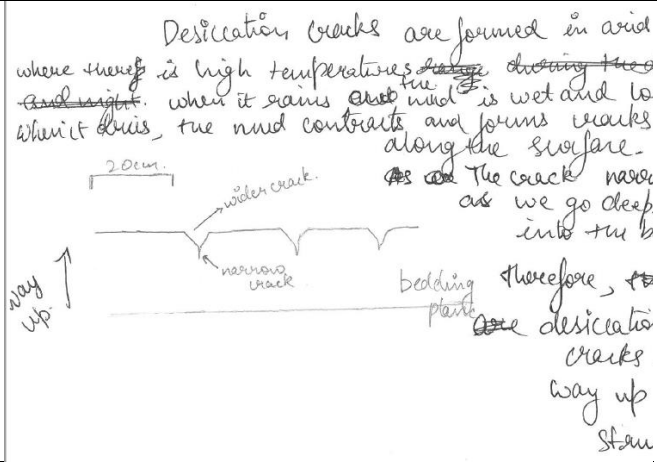
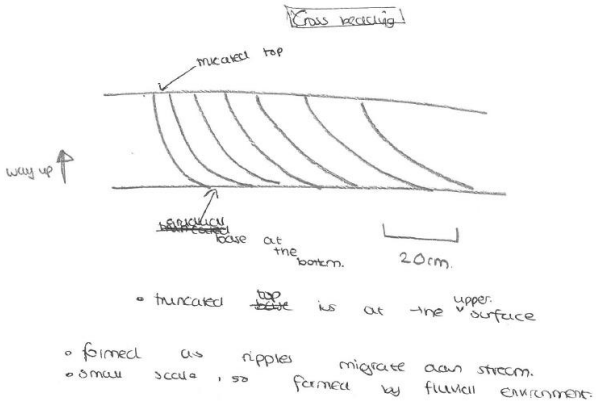
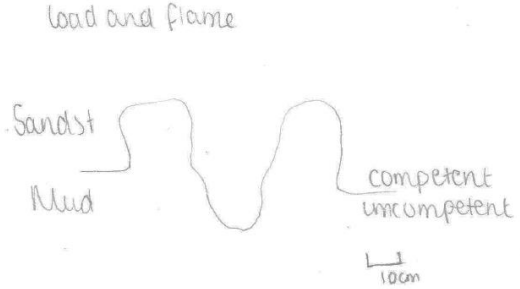
Q6	Marks	Expected Answer	Acceptable Answer	Do Not Accept
(a)	(2)	• Limestone • Made up of Calcite Or Made from fossils	• Bioclastic/shelly/crinoidal Limestone • Made from $CaCO_3$ Or Reacts with HCl	• Chalk or Oolitic Limestone • Any reference to hardness
(b)	(2)	• Shallow marine • Tidal oxygenated marine		• If more than 2 boxes are ticked, deduct 1 mark for each box which is wrongly chosen to a minimum of 0
	Total 4			

Q7	Marks	Expected Answer	Acceptable Answer	Do Not Accept
	(12)	Candidates are asked to complete a sketch cross-section not to construct, so the mark scheme allows for some variations in dips/positions of beds. There are 13 marks available, please mark to a maximum of 12. Use the annotated cross section as the mark scheme • Base of B correct at X • Base of B correct at Y • F1 vertical • Pluton plotted correctly. • F1 to correctly displace beds below the surface • Base of bed B to cut projected fold limbs • Base of bed B to be cut by F1 • Western limb of antiform, plotted correctly • Eastern limb of antiform, plotted correctly • Antiform Fold Axis drawn with correct symbols and vertical • Correct plot of base of H to the E of F1 • Base of either Bed F or A correctly plotted underneath bed B near X • Synform axis drawn with correct symbol and dipping towards X.	• Approximate dip values for fold limbs (50° - 70°) and (30° - 50°) • Faults, unconformities, igneous bodies and be outcrops within approximately 6mm of correct location on the surface • Pluton with a vertical edge	• Any dip >5° on the unconformities. • APTs that do not approximately bisect the folds
	Total 12			



Q8	Marks	Expected Answer	Acceptable Answer	Do Not Accept
	(4) N	Please see attached exemplars and annotate the marks that you have awarded • Suitable diagram and named structure (of one of the following): Cross-Bedding, Graded bedding, Flute Cast, Sole Structure, Convolute bedding, Load and Flame, Symmetrical ripple marks, Asymmetrical ripple marks, Trace fossils, desiccation cracks		• Just a name of a sedimentary structure or a named fieldwork location. • An incorrectly named diagram
	W	• Relevant reference as to which is the correct way up of the structure (e.g. top and bottom labelled or way up arrow shown or written explanation).	• This could be in the form of an arrow	
	D	• Correct description/name of the environment required to form the chosen sequence e.g arid desert, fluvial, delta, turbidity current, beach	• Correct description/name of the environment required to form the chosen structure e.g arid desert, fluvial, delta, turbidity current, beach	

	E	Explanation of the origin of the chosen sequence e.g. explanation of: • deposition of sediment in aeolian dunes • deposition in (mega) ripples (fluvial) • deposition on a delta, • deposition by turbidity currents • coastal deposition of sand by tides/waves • deposition in lake in arid climate.	Explanation of the origin of the chosen structure e.g. explanation of • deposition on advancing front face of Aeolian dune to create large scale cross bedding • deposition on advancing front face of (mega) ripple to create smaller scale cross bedding • deposition into body of water and subsequent sorting to create graded bedding • erosion and infilling at base of turbidity current to create flute casts/sole structures • sinking of denser sediment into less dense sediment to create load and flame/convolute bedding • action of waves on beach to create symmetrical ripple marks • drying and contraction of lake sediment to create desiccation cracks • No double jeopardy, the correct description and explanation of incorrectly named sequence/structure should be credited	
	Total (4)			

 - The more dense, competant sand-stone sinks into the less dense, incompetant shale.	 Graded Bedding There was a decrease in ~~the~~ energy levels from high to lower levels as high energy levels carry larger sediments which have a too higher mass to be carried by lower energy levels. As energy levels decrease ~~sand~~ sediments are deposited due to their mass.	 The competent sand is heavier sinks into the incompetent which cannot support it. T sinking motion forces the sh rise upwards as the sand pu down into the shale.
Named Diagram ✗ Way Up ✗ Description of Environment ✗ Explanation of Origin ✓	Named Diagram ✓ Way Up ✗ Description of Environment ✗ Explanation of Origin ✓	Named Diagram ✓ Way Up ✓ Description of Environment ✗ Explanation of Origin ✓
 Desiccation cracks are formed in arid where there is high temperatures ~~during the day and night~~. when it rains ~~and~~ the mud is wet and lo when it dries, the mud contracts and forms cracks along the surface. ~~As~~ The crack narro as we go deep into the b Therefore, ~~the~~ desiccatio cracks way up Stam	 • truncated ~~top base~~ at the upper surface • formed as ripples migrate down stream. • small scale, so formed by fluvial environment.	 The competent rock falls into the uncompetent the underlying rock shoots up into the competent rock.
Named Diagram ✓ Way Up ✓ Description of Environment ✓ Explanation of Origin ✓	Named Diagram ✓ Way Up ✓ Description of Environment ✓ Explanation of Origin ✓	Named Diagram ✓ Way Up ✓ Description of Environment ✗ Explanation of Origin ✓