

# Coastal Study Delimara Peninsula

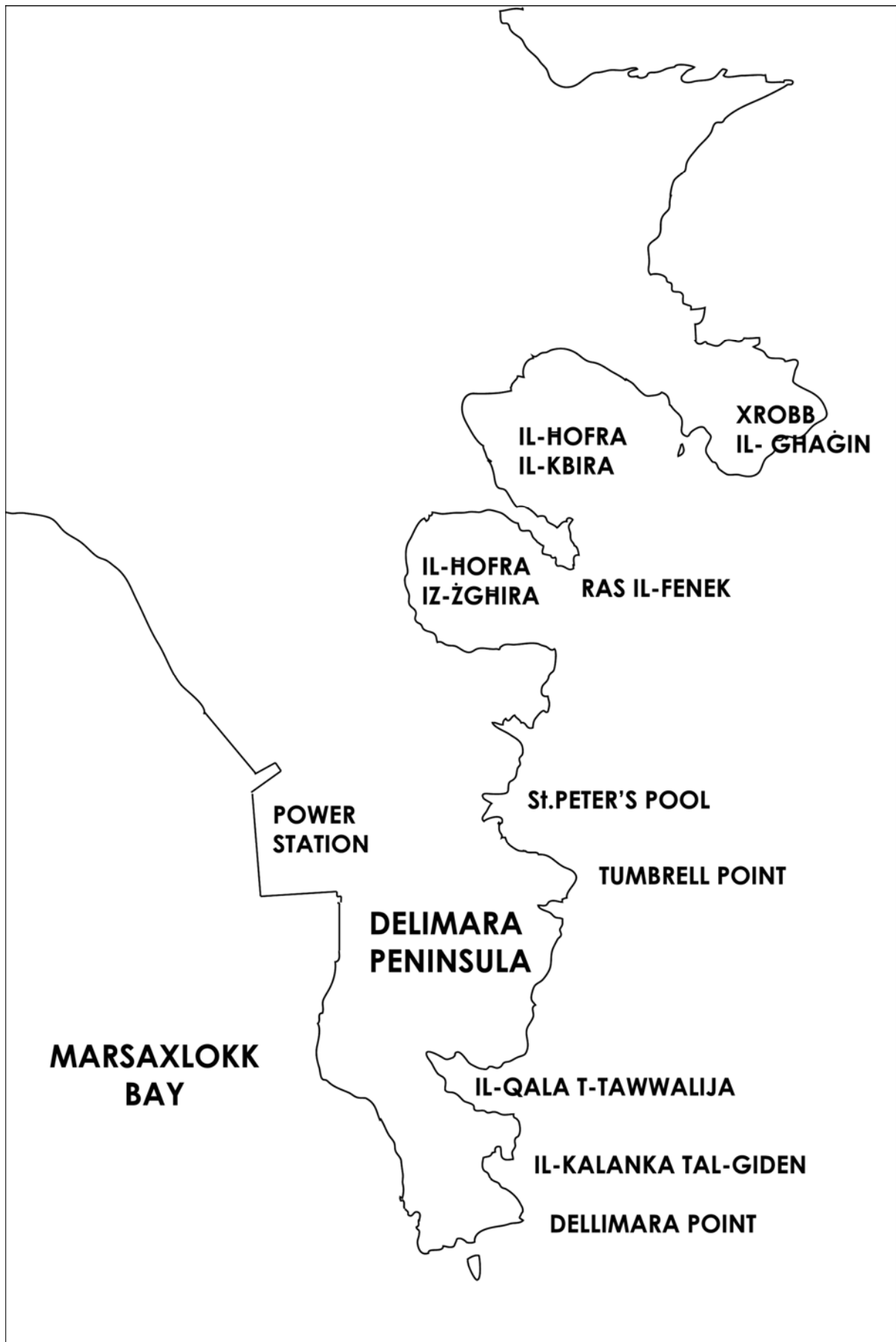


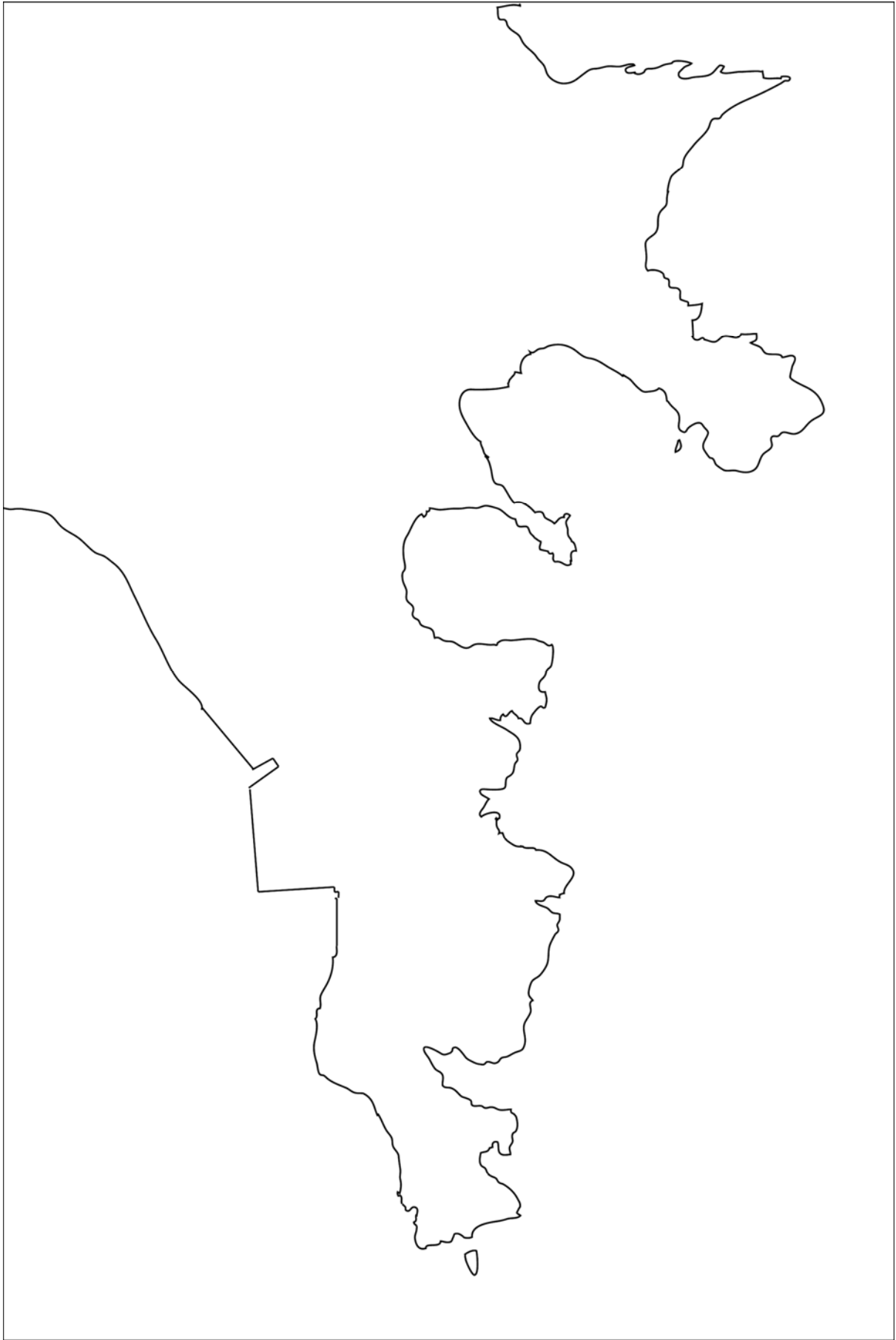
Edward Gilson

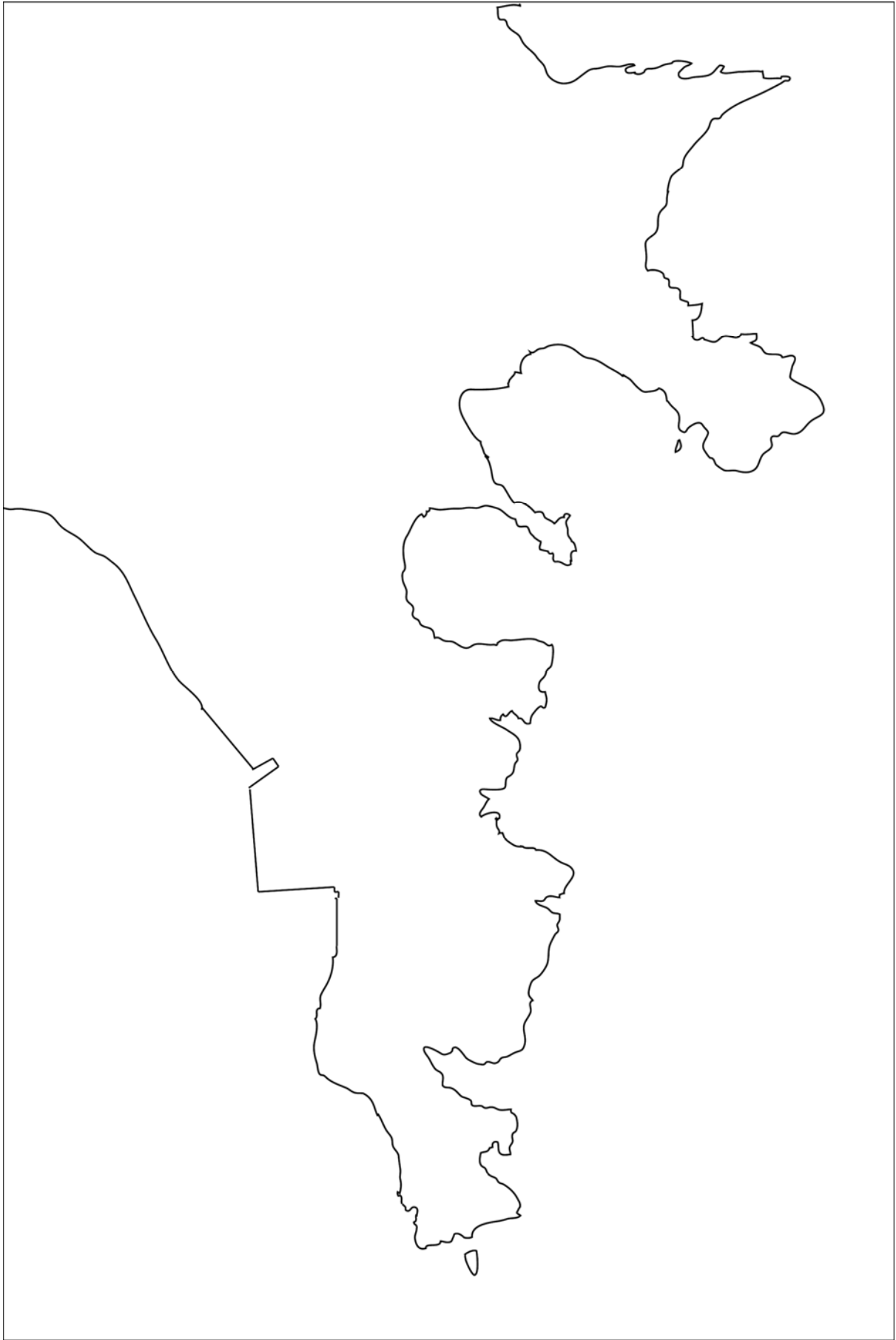


Fieldwork Report









**The coastline is where the land meets the sea. It is a place of enormous variety and great fascination. Sometimes the pounding waves wear away the land to produce steep cliffs; elsewhere the land merges gently into the sea in the form of a beach. In some places the coastline is almost straight for long stretches; in other places it is a series of tiny bays and jutting headlands.**

1. On the outline map provided mark all the coastal landforms along the route from Delimara to Xrobb l-Għagin.
2. On another map mark also the various coastal land use along the route.
3. What is causing the shape of the coastline at Delimara Peninsula to change?

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4. Name the three factors that influence wave height and energy.

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5. Say if Delimara Point is sheltered or exposed to the following winds.  the correct answer.

Wind	Exposed	Sheltered
East		
West		
North-west		
North		
North-east		
South-west		
South-east		

6. At Delimara one would expect the largest waves to come from the ..... because of the long fetch in that direction.
7. Is the sea actively eroding the cliff on the day of the fieldwork?
8. The coastline between Delimara Point to Xrobb l-Ghagin has some of the most spectacular scenery in Malta. This coastal scenery owes much to the rocks and relief of the area.

Examine and describe the type of rock found in the area by filling the table below.

<b>Name of Rock</b>	<i>English</i>	
	<i>Maltese</i>	
<b>Sub-division</b>	<i>English</i>	
	<i>Maltese</i>	
<b>Main group</b>		
<b>Surface Colour</b>		

<b>Resistance</b>	
<b>Permeability</b>	
<b>Formation</b>	
<b>Fossils</b>	
<b>Use</b>	

- 9 a. What evidence can you notice that suggests that the rocks here are sedimentary? Take photographs and draw sketches if needed.

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- b. Try and look for evidence that clearly proves that sedimentary rocks were formed under the sea millions of years ago. Take photos and make simple sketches if necessary.

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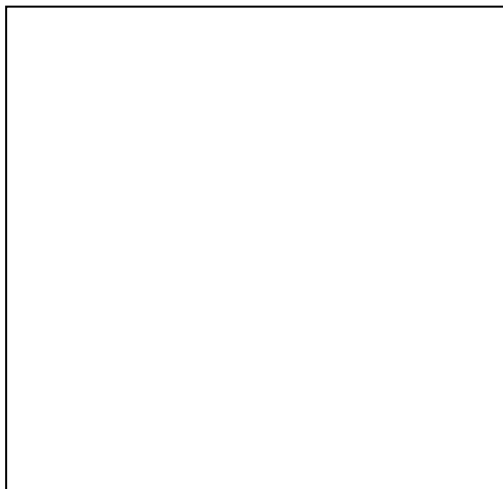
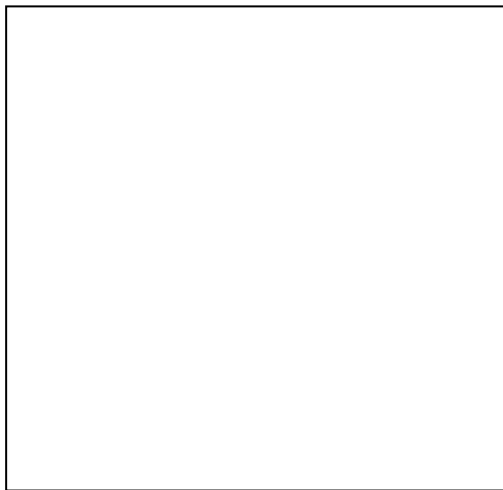
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10. Describe the way how waves erode or wear away the coast in this area. Find examples and take photographs of each type of erosion named below.

### **Corrasive Action**

*Corrasive action is also known as ..... . It occurs when boulders, pebbles and sand are hurled against the base of a ..... by breaking ..... . This causes ..... And rocks break up. Most corrasive action takes place at the base of the cliff and in time a ..... is worn away at the base of the cliff.*

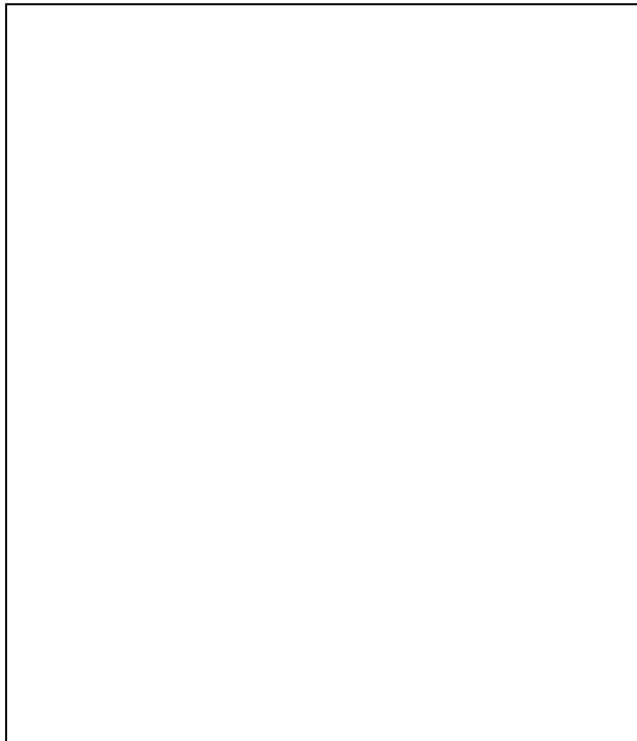
### **Hydraulic Action**

*This is also known as ..... . When waves break against the foot of a cliff, air in joints, bedding ....., cracks and crevasses is suddenly ..... . When the wave ..... the air expands often with a great an explosive force. This action causes the rocks to shatter as the cracks become ..... and extended.*

### **Attrition**

*This occurs when boulders and pebbles are ..... Against the shore as they ..... With one another. Rocks break in to ..... Pieces. In this way particles become rounded, ..... And are reduced in .....*

11. Find examples of pot holes formed by the process of erosion during storms. Measure the diameter and depth of these hollows. What do we usually find in the bottom of these hollows? Draw a simple sketch of these pot holes. Briefly explain how these hollows are formed and enlarged by wave action.



Pot holes formed by the processes of erosion

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1. The coastal landforms present at Delimara Peninsula are also the result of a number of weathering processes namely, solution, salt crystallisation and biological weathering. Briefly describe each weathering process.

**Solution**

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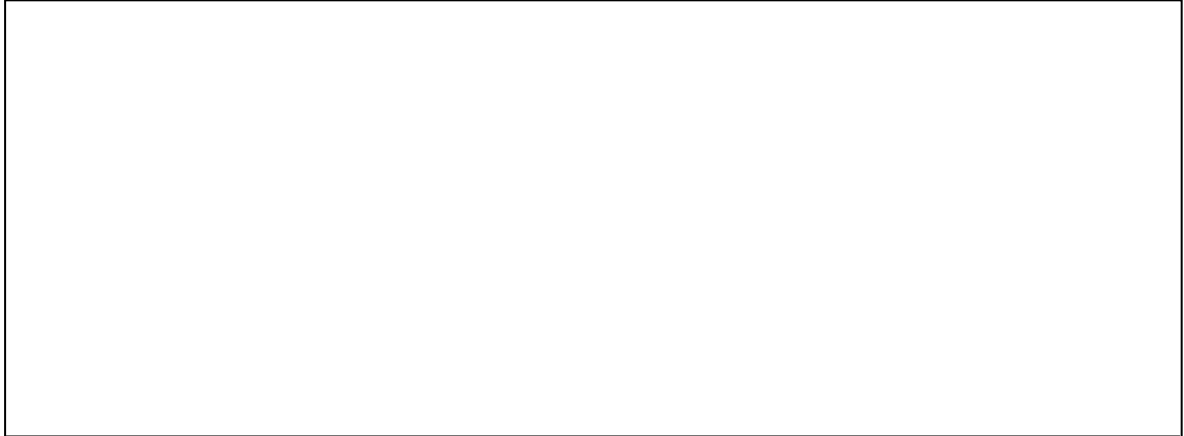
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Use a measuring tape and a metre ruler to find out the length, depth and width of some of these solution hollows. Now using these measurements make a simple sketch to show the scenery developed by solution.



**Landforms formed as a result of solution weathering**

**Salt crystallisation**

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Find examples of this type of weathering which can result in honeycomb structures.

**Biological Weathering**

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Find examples and take photos of these marine organisms which actually wear down rock surfaces.

13. Create a labelled sketch of a cliffed coast to show:

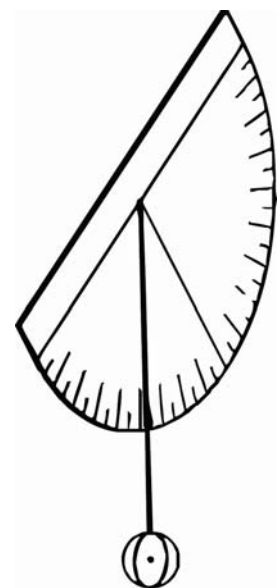
- bedding planes
- boulders
- joints
- wave cut platform
- notch
- erosional features

Measure the features you can identify using a tape measure and a clinometer. If this is not possible then estimate the dimensions carefully.

- Find the height of the cliff using the clinometer.

*Look for a plastic 180 degree protractor. Drill a hole at the centre of the angles. Find a short length of fine fishing line, 10 cm longer than the radius of the protractor. At one end make a large knot, or knot it around a small object such as a very small washer. Pass the line through the hole at the 'centre' of the protractor and fasten a small steel nut at the other end. The nut should be heavy enough to pull the fishing line straight. The line and weight form a pendulum to provide a vertical reference.*

*To use the clinometer, hold the base uppermost, so that the nut hangs down vertically (as shown in the diagram). Hold the clinometer out at arms length and sight along it,*

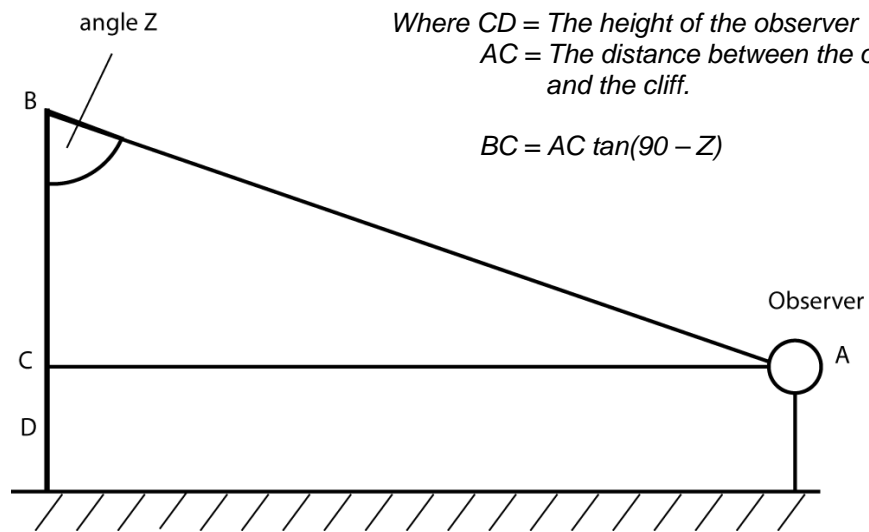


until your eye and your arm make a straight line to the top of the cliff. Allow the pendulum to swing freely below the protractor's curved edge. When it has stopped swinging press the fishing line against the protractor scale and read the angle. Depending upon the ways the protractor is graduated you may have to subtract the angle from 90 degrees to give the angle of slope.

The height of the cliff is calculated as follows:  
 Height of cliff = BC + CD

Where CD = The height of the observer  
 AC = The distance between the observer and the cliff.

$$BC = AC \tan(90 - Z)$$



- Measure the height of the notch at the base of the cliff.
- Notice the layers or 'beds' of rock. Why do some stick out more than others?

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- Are the rocks dipping (sloping) towards the sea, away from it or are horizontally bedded?

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- Is the wave-cut platform sloping gently towards or away from the sea? Why?

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- What will happen when the wave-cut platform becomes wider and wider?

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- Are the cliffs here stable or are still retreating backwards?

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15. Find examples of caves and mark them on the outline map of Delimara Peninsula.

- Take photos of these caves. Label the photos clearly to explain how caves are formed.

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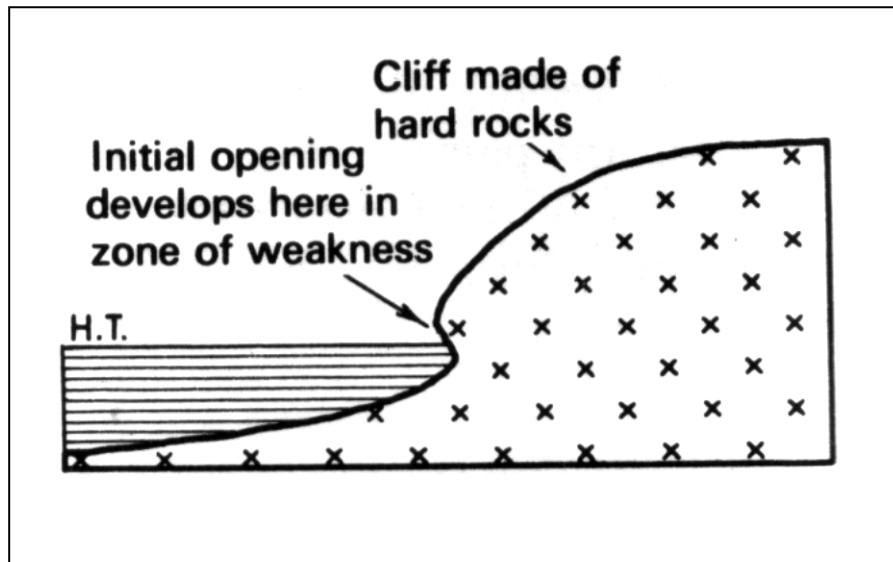
- What feature is formed if caves are linked to the cliff top by a vertical shaft?

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- What comes out through these blowholes during stormy conditions?

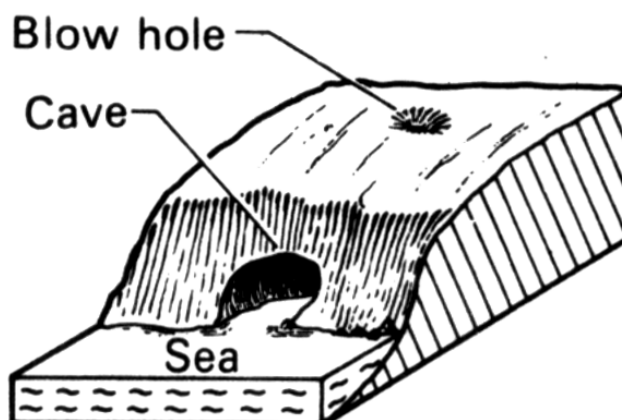
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- The diagram below shows the initial stage in the development of a blow hole. Draw two other diagrams extending the initial opening until it reaches the top of the cliff. Label the diagrams properly.





- The diagram below shows a cave linked by a vertical shaft to the cliff top forming a blow hole. What might happen if the roof of the cave ultimately collapses?



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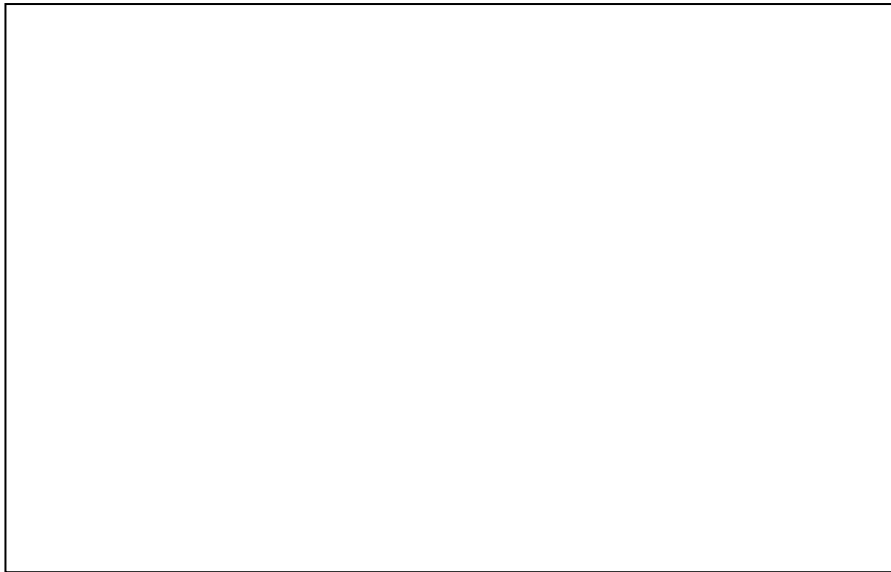
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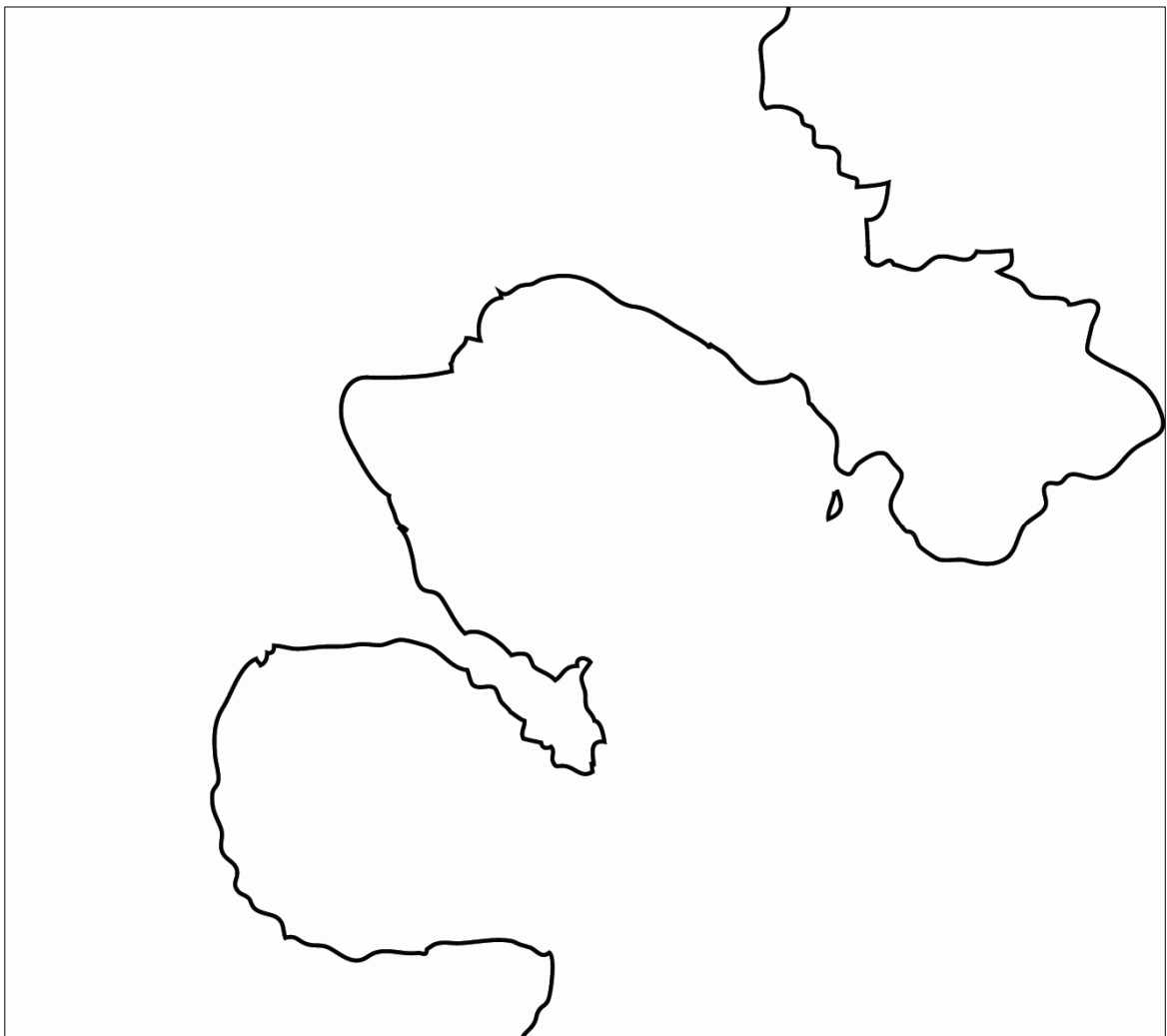
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- Draw a diagram to show what happens when the roof of the cave collapses.



16. Draw a sketch map showing the location of the two semi-circular bays known as *Il-Hofra ż-Żgħira* and *Il-Hofra l-Kbira* and the headland known as *Ras il-Fenek* jutting out between them. Label all important features and processes that are occurring.



The bays known as *Il-Hofra z-Zghira* and *Il-Hofra l-Kbira* have a ..... shape and are rather narrow at the ..... . The layers are dipping towards the ..... and as a result the Upper Globigerina Limestone which is ..... than the layer beneath it formed a barrier to marine erosion. Originally the part that is now the bay was dry ..... . After battering away for a long time, the sea finally ..... through the Upper Globigerina Limestone and has since widened the gap between the cliffs. Once the sea has broken through the outer wall of UGL, erosion of *Il-Hofra z-zghira* and *Il-Hofra l-Kbira* was .....

17. Label important processes that are occurring on a sketch of Ras il-Fenek.



Wave erosion is particularly ..... at Ras il-Fenek. When waves approach Ras il-Fenek they are bent or ..... . As a result they attack the headland on ..... sides. In fact a number of ..... are found on either side of the headland.

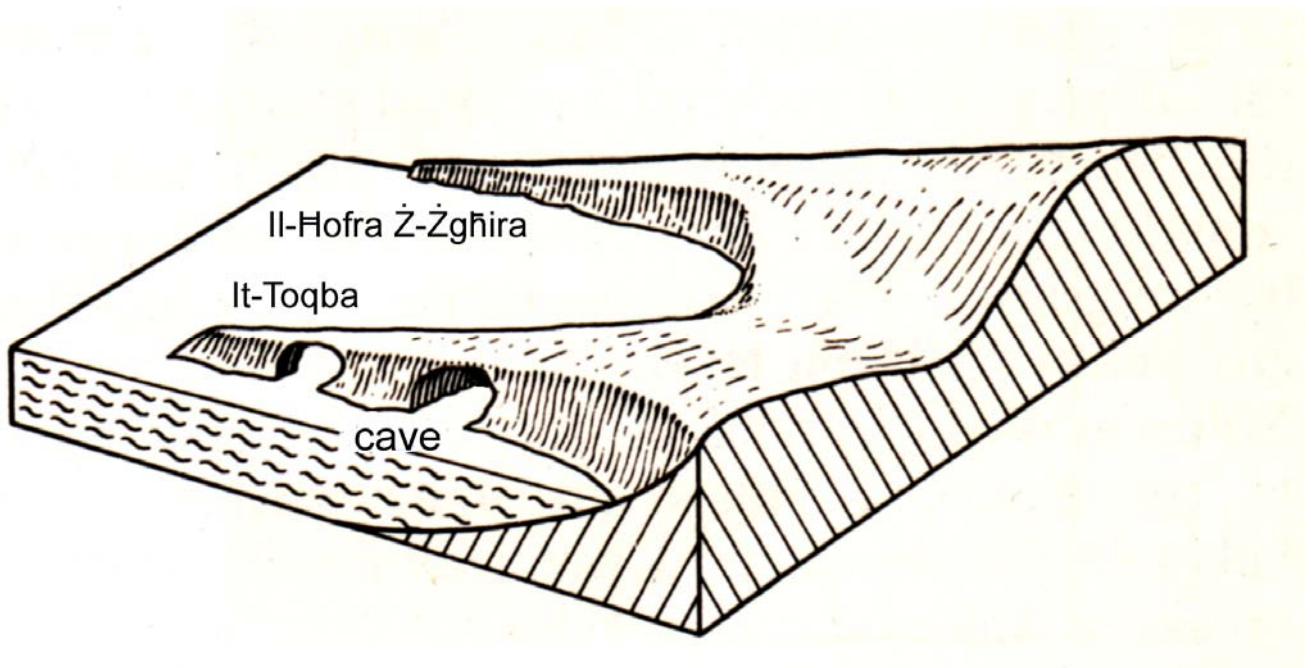
*Caves developed on either side of the Ras il-Fenek headland ultimately joined together and a natural ..... formed.*

18. What might happen at some time in the future to the small caves found at Ras il-Fenek?

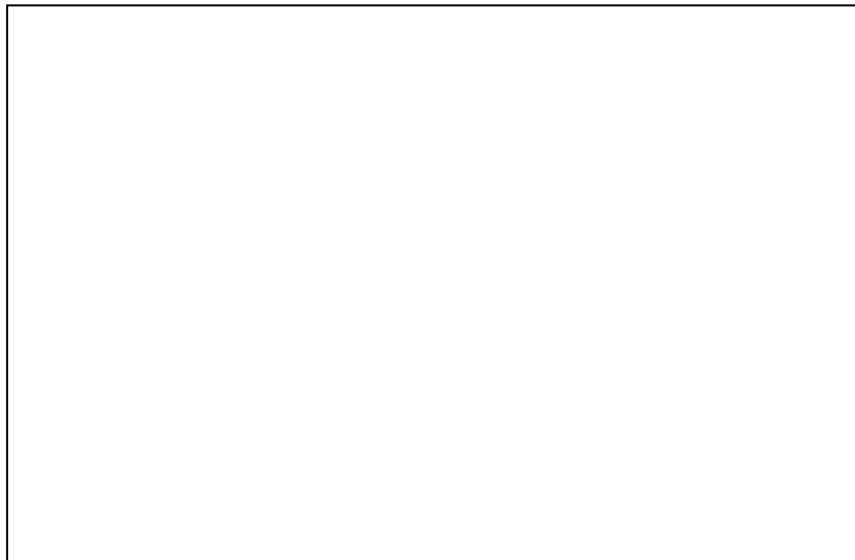
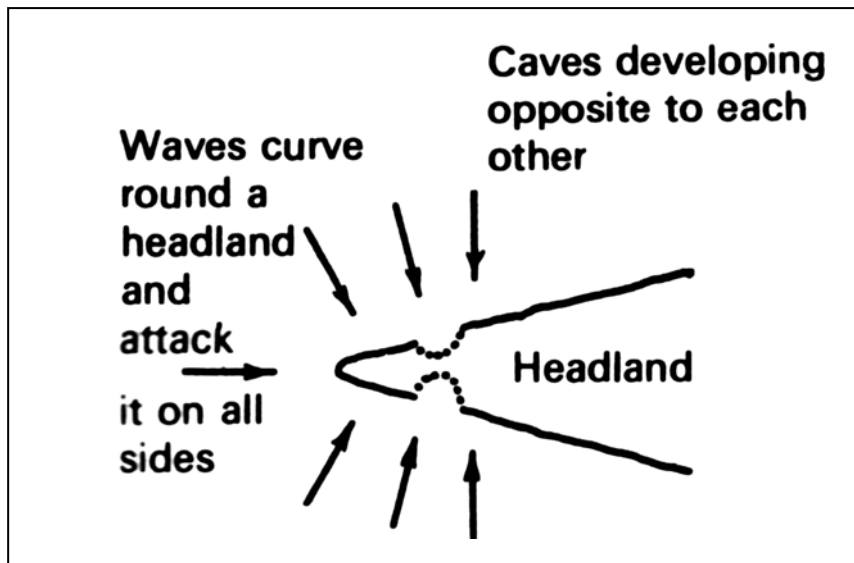
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19. What can happen to the arch as erosion continues?

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20. Continue the diagram below to show the stages in the development of an arch and a stack.



21. What do we call the material carried by waves? .....

- From where does this material come from?

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- Where is this material usually deposited?

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- Are there any signs of beach formation in the area?

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21. List the uses made of the coastline along the route from Delimara to Xorb il-Għagin.


- Mark this variety of coastal land use on one of the maps of Delimara. Title your map 'Land use at Delimara Peninsula'.
- Take photos of the various activities that take place on this coastline.

22. How can you tell that this area was important for salt production in the past?

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- Is salt production still produced here? .....
- Describe the appearance of the salt pans.

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- How is salt produced in these salt pans?

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23. Describe two ways in which people's use of the land around the Delimara Peninsula may be a threat to the landscape and wildlife in the area.

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