Weathering and Erosion
Coasts 2

Year 7 – Coasts

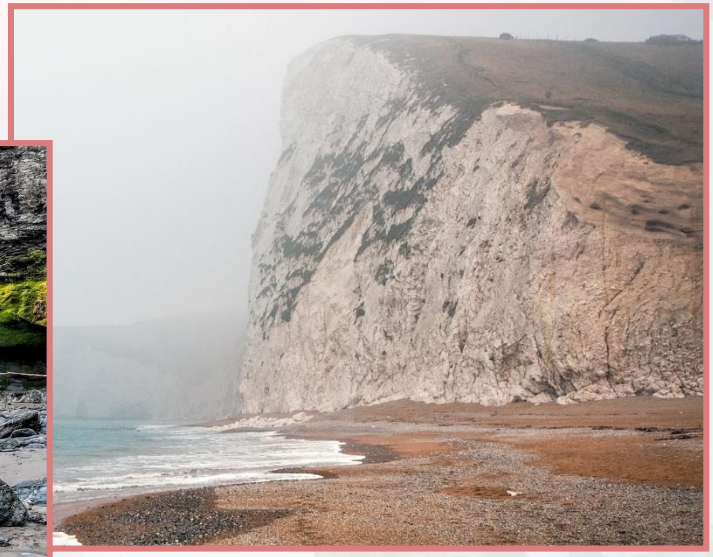
This week you will look at weather and erosion. Work through the slides and complete the tasks as you go.

There is lots to learn with weathering and erosion and this work should take you two weeks. Complete the tasks as you work through the PowerPoint and there is an optional additional task at the end.

Good luck!

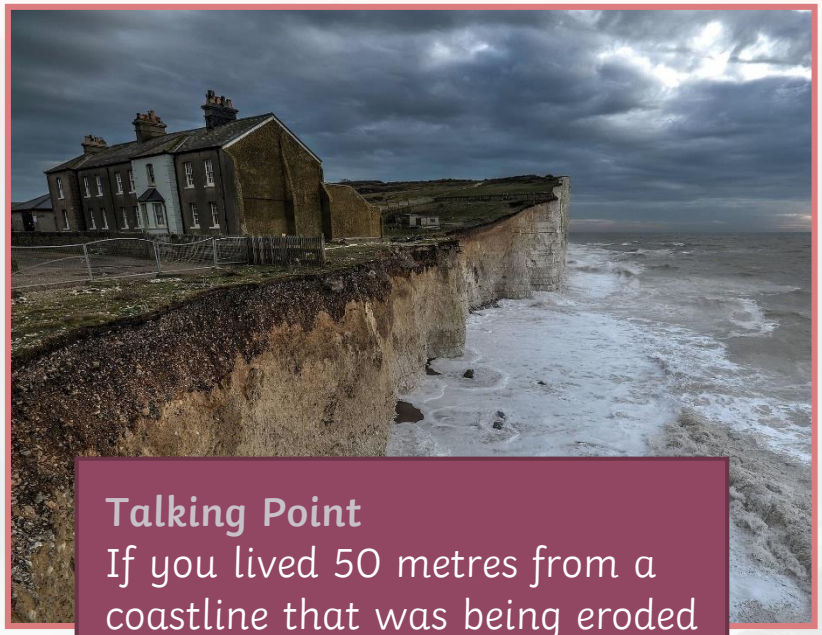
What do you think?

If one cliff is made of granite and another made from chalk, which will erode faster?



Coastlines

The coast is where the sea meets the land. Coastlines are constantly changing because of the action of waves and the weather.



Talking Point
If you lived 50 metres from a coastline that was being eroded by 5 metres every year, what would you do? Would you be able to sell your house?

Sometimes the change is extremely slow – especially in sheltered areas and when the rock type is hard, like granite.

In other areas, weaker rock and stronger waves mean that several metres of coastline are lost to the sea every year.

What Is Happening on the Coast?

Can you work out the order that the following processes take place?

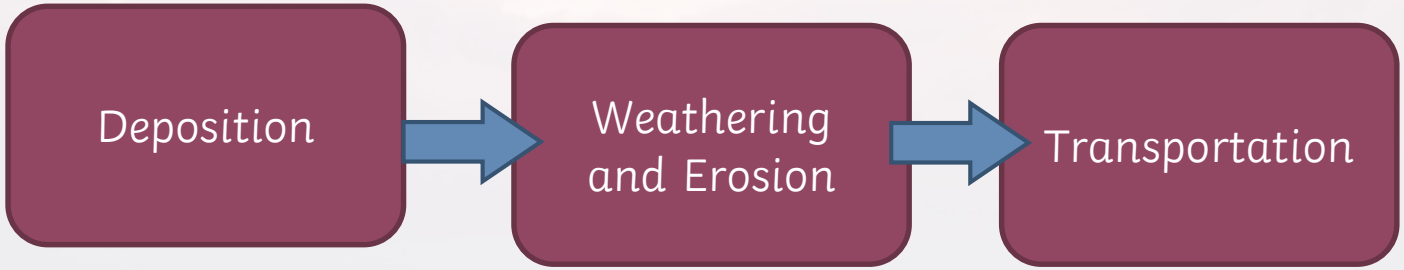
Transportation

Deposition

Weathering and Erosion

What Is Happening on the Coast?

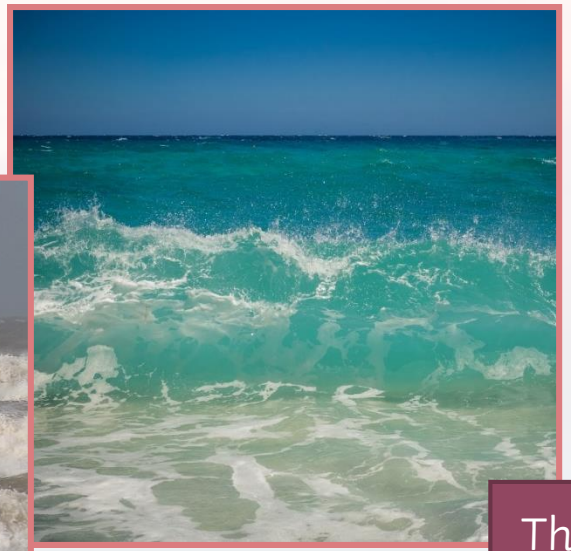
The below is the correct order… Did you get it right?



Today, we're going to look at how weathering and erosion affect coastlines.

Mechanical Weathering

This is when the rocks at the coast are affected by the weather.



There are two main types of mechanical weathering that take place around the coast.

Mechanical Weathering

Freeze-Thaw

Rain and sea water can get into cracks in the rock. In cold weather, this water freezes at night and turns to ice. The ice thaws in the day and becomes water again, but often freezes again the following night. The process is repeated many times.

Because water expands when it freezes and turns to ice, this continual expansion and contraction can put pressure on rocks and break them apart. It is also known as frost shattering.

Complete the Freeze Thaw Weathering sheet:

freeze	sea	contraction	breaks
thaw	cliff	continuous	crumble
rain	expands	pressure	

Freeze-Thaw

Create a storyboard to explore how the process of freeze-thaw weathering affects cliffs at the coast. Write at least two sentences in each box to explain what is happening. The word box at the bottom of the sheet will help you – use as many of the words as you can.

Use these words to create your storyboard!

Mechanical Weathering

Wetting and Drying

Some rocks are softer than others and are more affected by the weather. Rocks like shale and clay expand when they become wet in the rain and then contract when they dry out.

This process makes cracks appear in their surface, making it easier for rainfall to get inside and cause more damage. This can cause pieces to break off, but it can also make large areas unstable and lead to landslides.

Write this paragraph out in your books choosing the correct word about wetting and drying.

Wetting and Drying

Select the correct word choices in this paragraph about wetting and drying.

Water has a large impact on **softer / harder** rocks, such as **clay / granite**.

The rocks get wet and then **contract / expand**. When they dry out, they **contract / expand**.

When they dry out, **arches / caves / cracks** appear.

This can cause rocks to **glue / crumble** and also lead to **tsunamis / landsides / explosions**.

Chemical Weathering

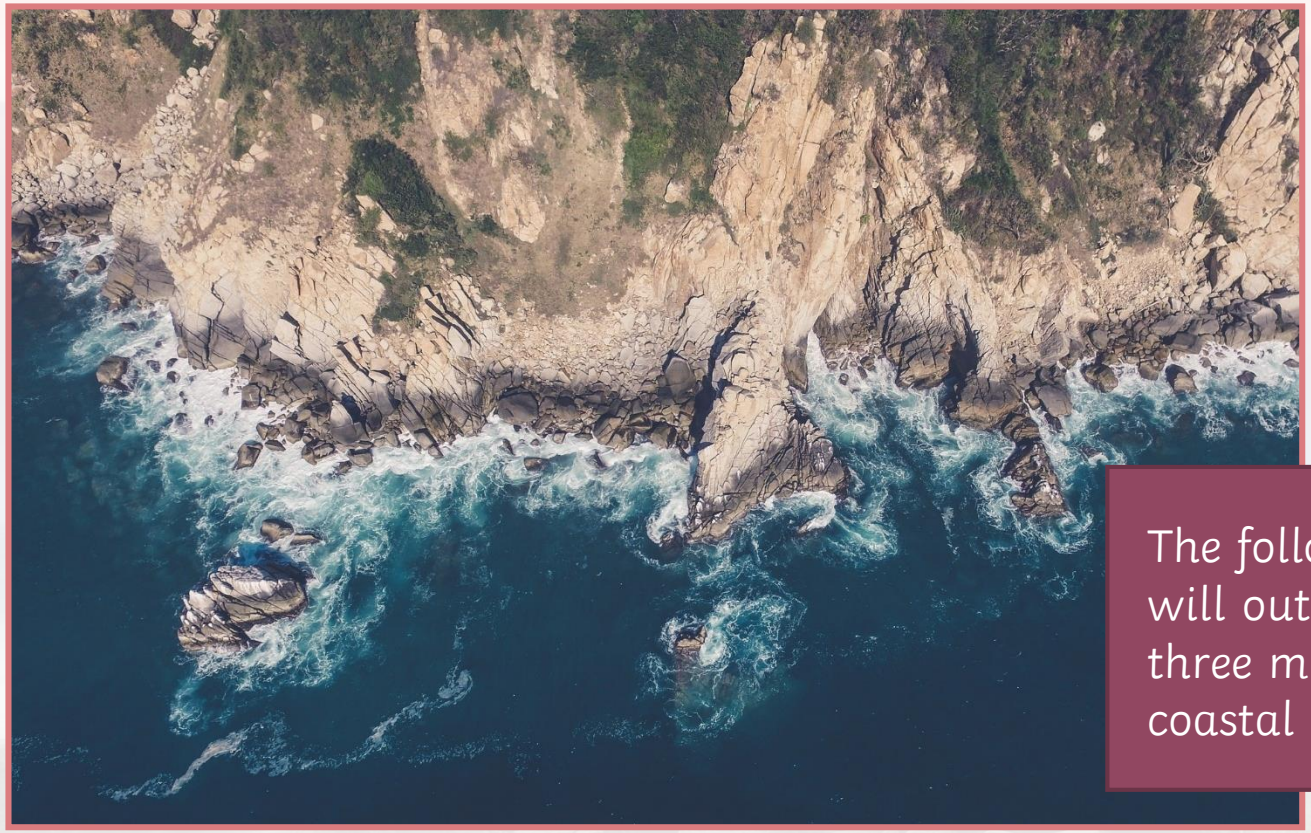
This is when water reacts with minerals in rocks and the structure of the rock is changed. The best example is solution.

As carbon dioxide dissolves in water, it becomes slightly acidic. When this slightly acidic solution comes into contact with rock, it can dissolve it over time.

Not all rocks are affected at the same rate. Some rocks, such as limestone, are especially susceptible to chemical weathering.

Coastal Erosion

Erosion at the coast is caused by the sea. Waves can be very powerful and cause a lot of damage to cliffs – especially if they are made of weak rock.



The following slides will outline the three main types of coastal erosion.

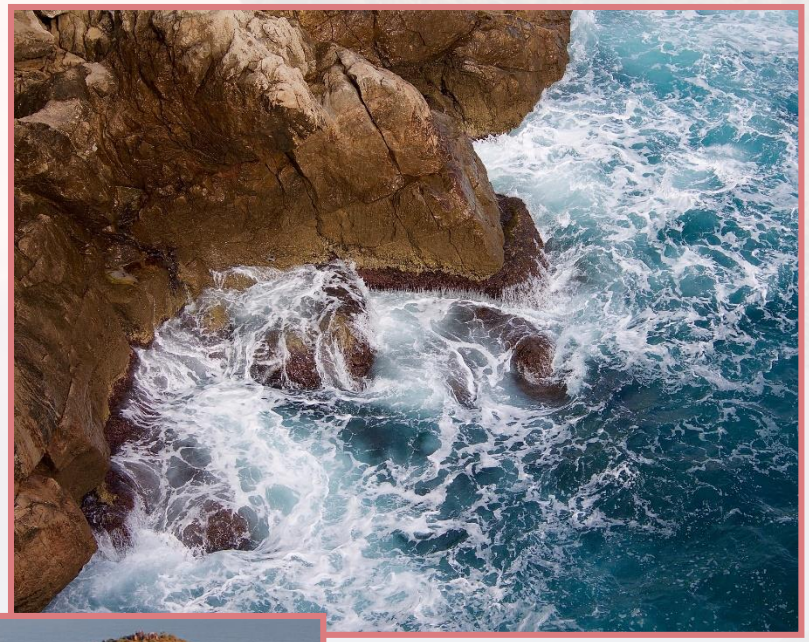
Coastal Erosion

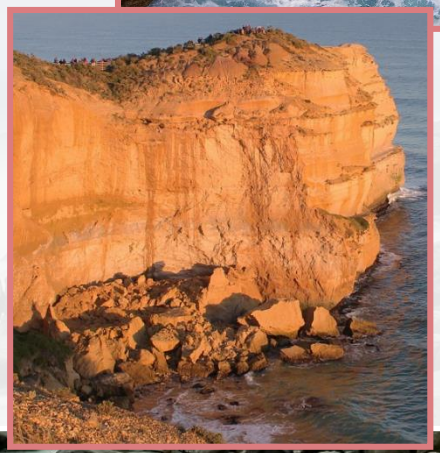
Hydraulic Action

The constant pounding of cliffs by the waves causes a lot of damage. If there is a strong wind, large fetch and weak rocks, the waves will erode more of the cliff.

As the powerful waves smash into the cliff face, air is compressed in the small cracks in the rock. Tiny fragments of rock get blasted away as the process is repeated many times.

After a large storm, hydraulic action can wear away a lot of rock at the base of a cliff. Sometimes, this leaves the upper part of the cliff unstable and causes it to collapse.





Use the storyboard below to explain how hydraulic action can erode cliffs. In each box, draw a picture and write at least two sentences to explain what is happening. You can also add labels to your pictures if you wish. Try to include all the words in the box at the bottom of the page.

Use these words to complete your storyboard!

cliff	fetch
sea	wind
wave	powerful

air	erosion
compression	collapse
blast	

Coastal Erosion

Abrasion/Corrasion

Abrasion and corrasion are the same thing.

During storms, the strong waves pick up rocks, pebbles and sand. The material is then smashed into the cliff face, creating an effect a little like sandblasting. This can break off pieces of the cliff face.

Experts believe this is the most damaging type of erosion.

Coastal Erosion

Attrition

Imagine having a box of pebbles. If you continually shook the box, all the pebbles would bump into each other and eventually wear each other down. Over time, they would become smaller and more rounded.

This process happens in the sea: waves constantly move material such as rocks and pebbles. They get bashed onto the surface and into each other.

Complete the Venn Diagram on the **Abrasion/Corrasion and Attrition Activity Sheet** to highlight the similarities and differences between attrition and abrasion.

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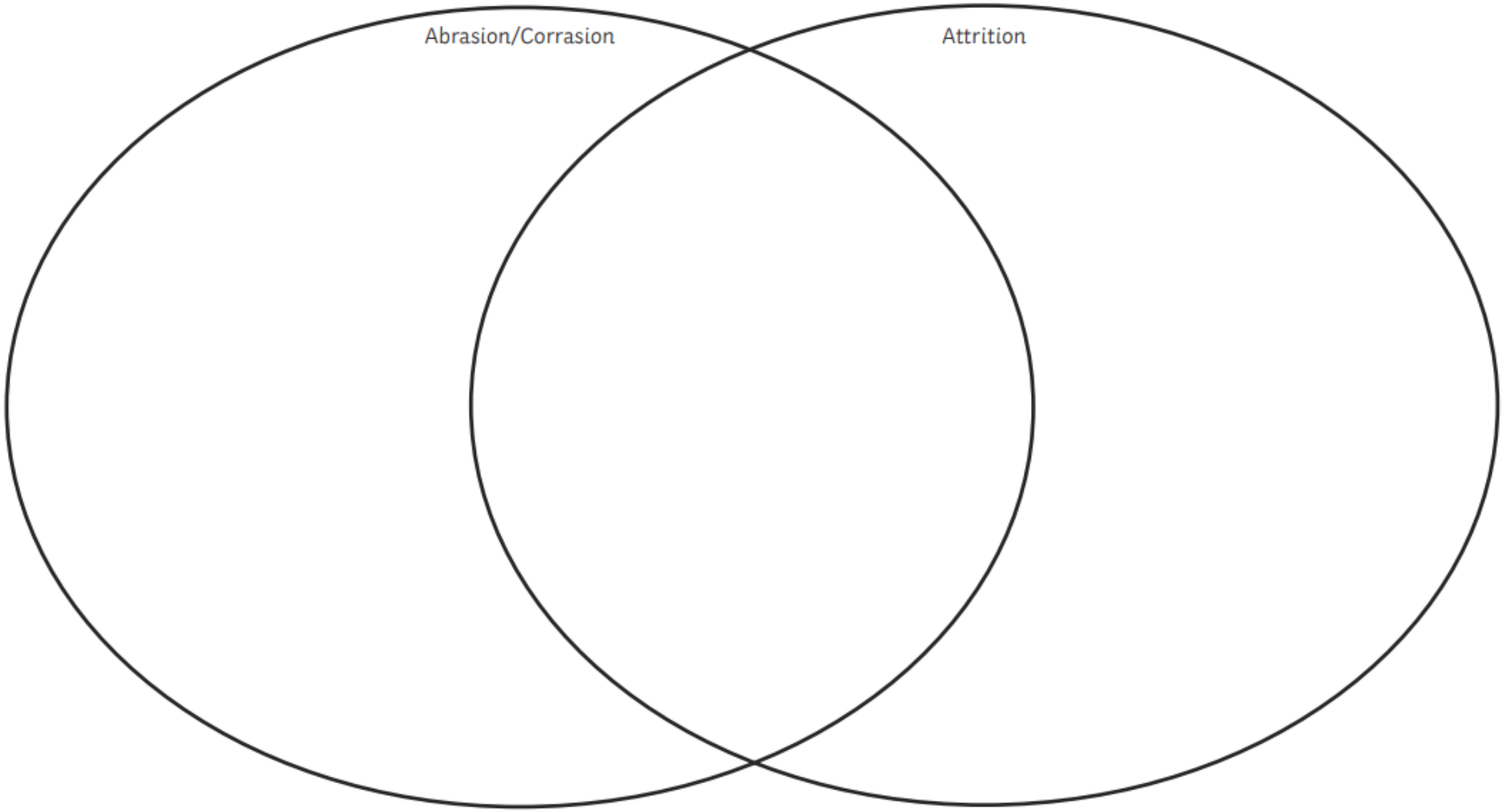
Abrasion/Corrasion and Attrition

Complete the Venn Diagram below to show the similarities and differences between abrasion/corrasion and attrition.



Weathering and Erosion

You have discovered three types of weathering and three types of erosion. All are very important when it comes to shaping our coastlines. They help to make new landforms – and to wear older ones away.

Weathering and Erosion

Now you have been introduced to all the different types of weathering and erosion, complete this sheet to show your understanding of the processes. For each physical process, draw a picture and write a sentence to explain how it works.

Wetting and Drying	Freeze-Thaw	Chemical Weathering

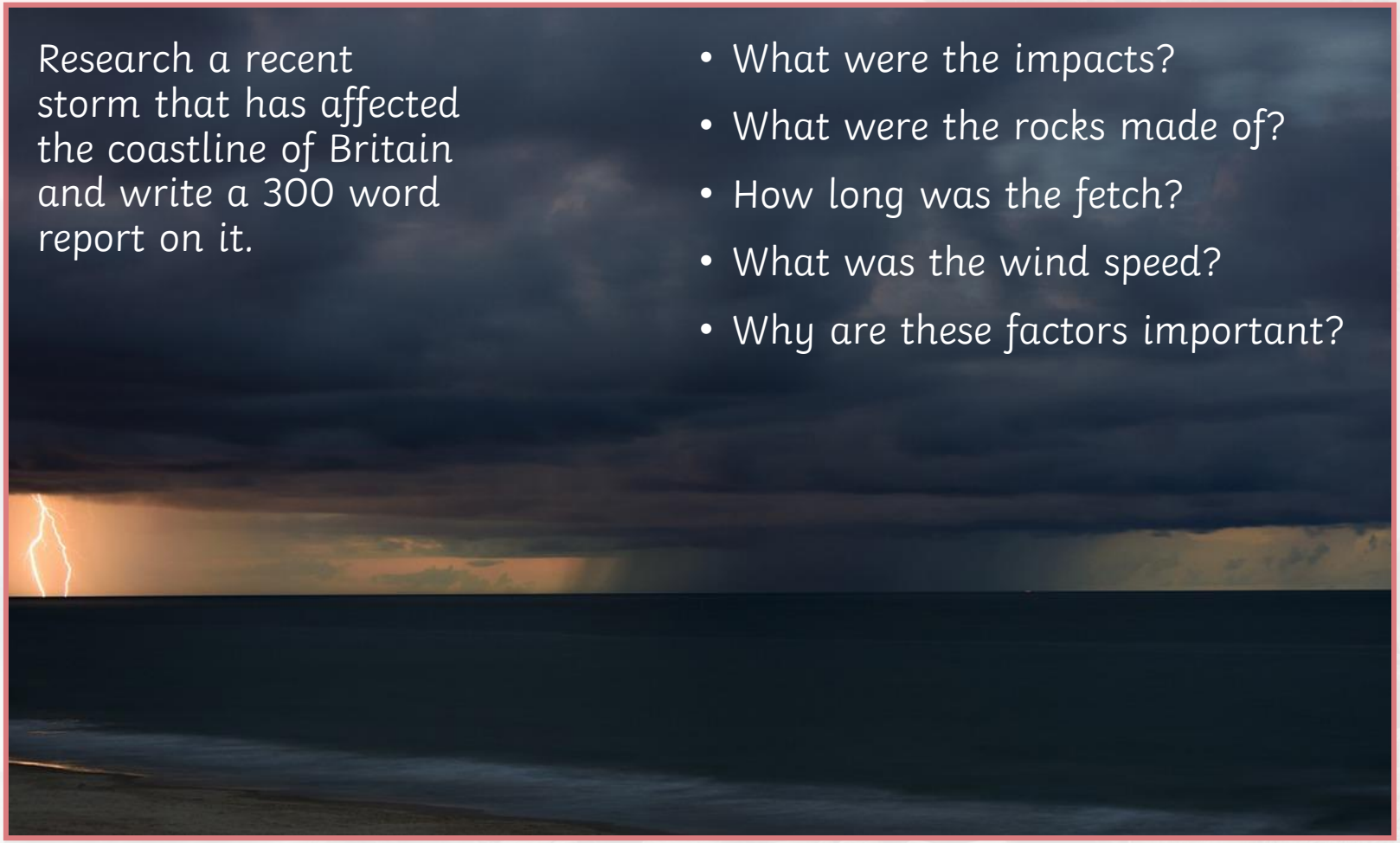
Abrasion/Corrasion	Attrition	Hydraulic Power

Which Process?

Look and the key factor and decide which process it is associated with.

air compressed in cracks	hydraulic action
rocks hurled at cliffs	abrasion
needs cold temperatures	freeze-thaw
pebbles hit each other	attrition
rocks dry out and crack	wetting and drying

Extra activity (Optional)



Research a recent storm that has affected the coastline of Britain and write a 300 word report on it.

- What were the impacts?
- What were the rocks made of?
- How long was the fetch?
- What was the wind speed?
- Why are these factors important?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