Helping you deliver the KS3 Programme of Study

This chapter addresses these areas of the Programme of Study:

Key concepts
Place Understand the physical and human characteristics of real places; develop geographical imaginations of places. Space Know where places and landscapes are located, why they are there, the patterns and distributions they create, how and why these are changing, and the implications for people. Interdependence Explore the social, economic, environmental and political connections between places; understand the significance of interdependence in change, at all scales. Environmental interaction Understand that the physical and human dimensions of the environment are interrelated, and together influence environmental change.

Key processes
Geographical enquiry Ask geographical questions, thinking critically, constructively and creatively; analyse and evaluate evidence, presenting findings to draw and justify conclusions. Graphacy and visual literacy Use maps, photographs and other geographical data; construct maps. Geographical communication Communicate knowledge and understanding using geographical vocabulary and conventions in both talk and writing.

The big picture
These are the big ideas behind the chapter:
- Our coastline is continually shaped and changed by physical and human processes.
- The waves shape and change the coast by eroding, transporting and depositing material. The result is special coastal landforms.
- We humans also change it, through the way we use the land.
- In many areas along the south and east coasts, erosion is threatening settlements.
- The challenge is to defend the coast against erosion in a sustainable way.

A pupils’ version of this big picture is given in the geog.2 students’ book opener for Chapter 2, and in geog.2 resources and planning OxBox CD-ROM, for the whiteboard.

Chapter outline
Use this, and their chapter openers, to give pupils a mental roadmap for the chapter.

2 Coasts As the pupils’ chapter opener, this unit is an important part of the chapter; see page 11 for notes about using chapter openers
2.1 Waves and tides What they are and what causes them
2.2 The waves at work How waves erode, transport, and deposit material
2.3 Landforms created by the waves The landforms you find along the coast, created by the waves – some through erosion, some through deposition
2.4 The coast and us The ways we use, and change, the coastline
2.5 Your holiday in Newquay Brush up on OS map skills, at this surfing resort
2.6 How long can Happisburgh hang on? How and why the village of Happisburgh (pronounced Haisbro) is being nibbled away by the sea
2.7 The war against the sea Where erosion is a problem along the coast, and how it can be slowed down
2.8 Defend – or let go? What’s the strategy? And should there be compensation, for property lost to the sea?

Objectives and outcomes for this chapter

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Outcomes</th>
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<tr>
<td>Most pupils will understand:</td>
<td>Most pupils will be able to:</td>
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<tr>
<td>● that our coastline is shaped by both physical and human processes</td>
<td>give examples of physical and human processes that shape the coastline</td>
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<td>● what causes waves, and tides</td>
<td>explain that waves are caused by the wind, and say how its strength, duration and fetch affect them; explain that the tides are caused by the pull of the moon (and to a lesser extent, the sun) on the sea</td>
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<td>describe the processes of erosion, transport and deposition by the waves; say that weathering helps to make erosion easier</td>
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<td>● how the waves shape the coast, and that weathering contributes to it</td>
<td>give at least six examples of ways we use the coast; and say what special functions a coastal town can have</td>
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<td>name, describe and identify the coastal landforms covered in the chapter; explain how they are formed</td>
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<td>● that the action of the waves leads to characteristic coastal landforms</td>
<td>give at least four ways to protect coastal places from erosion</td>
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<td></td>
<td>describe the problems at Happisburgh</td>
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<tr>
<td>● that we use the coast in different ways, some directly related to the sea</td>
<td>give at least four ways to protect coastal places from erosion</td>
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<td>explain why the government does not want to protect all the places at risk of erosion; say what the current strategy is, for defending the coast</td>
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<tr>
<td>● that erosion is causing serious problems along some parts of the coast</td>
<td></td>
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<tr>
<td>● that there are things we can do to protect the coast from erosion</td>
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<tr>
<td>● that the current strategy is to defend the coast in a sustainable way</td>
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These tie in with the opening lines in each unit, which give the purpose of the unit in a pupil-friendly style.

Opportunities for assessment

See the formal assessment materials for this chapter on geog.2 assessment file & OxBox CD-ROM. They include a level-marked assessment with success criteria and a feedback form, interactive assessments, a scored test, and a self-assessment form.

There are other opportunities for assessment too. For example, you could use some of the more extended ‘Your turn’ questions in the students’ book, worksheets or longer learning activities from geog.2 resources and planning OxBox CD-ROM, or some of the ‘Further suggestions for class and homework’ at the end of this chapter.

Getting ready for this chapter

Some of the starters and plenaries suggested for this chapter may need resources prepared in advance. Check out the Resources section on the ‘Help at a glance’ pages.

geog.2 resources & planning OxBox CD-ROM has all the photos and diagrams from the chapter, for whiteboard display, plus movies and interactive materials. You will find these very useful for devising your own starters and plenaries. In addition, geog.world CD-ROM is a rich source of further material, including interactive weblinks and skills lessons.

Using the chapter starter

Why does the coast look so different in different places? It’s largely down to geology. Page 26 of the students’ book has a simple geological map, which you could refer to. The hardest rock – for example the Old Man of Stoer, made of rock around 1.2 billion years old – is the most resistant to erosion. See suggestions 1–4, on page 48 of this book, for further activities related to this chapter starter.
Waves and tides

About this unit
This unit explains what causes waves, and the tides, and introduces swash and backwash. In ‘Your turn’, pupils apply what they’ve learned – in response to questions about a diagram and photos – and then do some creative writing.

Key ideas
- Waves are caused by wind dragging on the surface of the water.
- The length of water the wind blows over is called the fetch. The stronger the wind, the longer it blows for, and the longer the fetch, the larger the waves will be.
- Waves ‘break’ in shallow water. The water that rises up the sand is the swash; it rolls back into the sea as backwash.
- When the swash is stronger than the backwash, material is added to the beach. If the backwash is stronger than the swash, the beach is eroded.
- The moon and sun exert a gravitational force on the Earth; so they draw the seas upwards, on the side facing them; at the same time, on the opposite side of the Earth, the seas are pulled outwards by a centrifugal force. As a result, the water level falls everywhere else around the Earth.
- These rises and falls in water level are called tides. There are high tides at a place twice a day, and low tides in between.
- As the moon travels around the Earth, and the Earth around the sun, the combined pull of the moon and sun changes; so the heights of the tides change too.

These rises and falls in water level are called tides. There are high tides at a place twice a day, and low tides in between.

Key vocabulary
wave, fetch, swash, backwash, tide, high tide, low tide, tidal range, prevailing wind (in ‘Your turn’)

Skills practised in ‘Your turn’
- Geography skills: drawing conclusions from maps; analysing photos
- Literacy skills: giving reasons, explanations, and evidence; making predictions
- Thinking skills: giving reasons, explanations, and evidence; making predictions

Unit outcomes
By the end of this unit, most pupils should be able to:
- define/explain the terms given in ‘Key vocabulary’ above
- explain that waves are caused by wind, and say how wind strength, duration and fetch affect them
- explain that tides are caused by the pull of the moon (and to a lesser extent, the sun) on the sea

Resources
For starter: 1: a set of images of waves, both shallow and stormy (try Google Images?)
For starter: 2: shallow tray, water and a straw
For plenary: a set of small cards, each with one term from ‘Key vocabulary’ written on.
For plenary: 10: simple animation showing tides (eg type NOAA tide animation into Google)

Ideas for a starter
1. Show images of waves. What do you think causes them? What makes these so different?
2. Make waves by blowing on the surface of water in a shallow tray, with a straw.
3. Mind-movie time! You are on a beach, all alone. What can you see and hear? Tell us.

Ideas for a starter
1. Explain that tides are caused by the pull of the moon (and to a lesser extent, the sun)
2. Explain that waves are caused by wind, and say how wind strength, duration and fetch affect them
3. Define/explain the terms given in ‘Key vocabulary’ above

By the end of this unit, most pupils should be able to:
- give reasons, explanations, and evidence; making predictions
- give definitions; writing a dramatic diary entry
- draw conclusions from maps; analysing photos
- analyse photos

For plenary: 1: shallow tray, water and a straw
For plenary: 2: shallow tray, water and a straw
For plenary: 3: a set of small cards, each with one term from ‘Key vocabulary’ written on.

Ideas for plenaries
Plan plenaries for strategic points throughout the lesson, as well as at the end.
1. Use any of questions 1–5 in ‘Your turn’ as a plenary about waves.
2. How do we use waves?
3. Can waves do us harm?
4. Do we get waves in rivers? Why? / Why not?
5. Use question 6 in ‘Your turn’ as a plenary about tides.
6. Ask pupils to read out their work for question 7.
7. Place the cards you have prepared (with the terms wave, fetch, swash, backwash, prevailing wind, tides, high tide, low tide, tidal range on face) down. With books closed, ask a pupil to choose a card, and act out (or describe, or draw on the board) what is on the card, for the rest of the class to guess. The pupil must not say the word(s) on the card.
8. (With books closed) What have waves got to do with geography? What do you think they are leading onto?
9. Take two minutes to work with a partner and think up one interesting question about waves, that we have not covered today. (This could produce a good enquiry question which the class could follow through.)
10. To finish off, display the animation showing what causes the tides.

Further class and homework activities
Suggestions 5–9 on page 48 of this book
Shipwrecked! in geog2, Coasts on geog.world CD-ROM

Answers to ‘Your turn’
1. Strength of wind; how long the wind has been blowing; length of the fetch.
2. b, because it is the strongest, with the longest fetch.
3. a, because it is light, like C, but has a shorter fetch.
3. a, because it is light, like C, but has a shorter fetch.
4. a, because it is light, like C, but has a shorter fetch.
5. a, because it is light, like C, but has a shorter fetch.
6. a, because it is light, like C, but has a shorter fetch.
7. a, because it is light, like C, but has a shorter fetch.
8. a, because it is light, like C, but has a shorter fetch.
9. a, because it is light, like C, but has a shorter fetch.
10. a, because it is light, like C, but has a shorter fetch.
The waves at work

About this unit
This unit explains how the waves shape the coast, by eroding, transporting and depositing material. In ‘Your turn’, pupils apply what they’ve learned, in response to questions about drawings and photos.

Key ideas
- Waves continually shape the coastline by eroding, transporting and depositing material. Weathering helps this process by making erosion easier. (Note that pupils usually study weathering in Science in Year 8.)
- The waves erode rock by: hammering into the cracks at high pressure; dissolving any soluble material; and flinging pebbles and sand at it, which scrape it away. They then knock rock fragments together so that these get smoothed and worn away.
- The end products of erosion are pebbles (shingle), sand, and mud.
- The way waves roll in and out, and their direction, means that most eroded material is carried parallel to the shore. This is called longshore drift. (Some is carried out to sea.)
- Beaches form in sheltered areas where the waves deposit sand or shingle.
- Some resorts have groynes (barriers of wood or stone) down the beach, to stop sand being carried away by longshore drift.

Key vocabulary
- erode, transport, deposit, weathered, hydraulic action, solution, abrasion, attrition, shingle, sand, longshore drift, groynes, prevailing wind

Skills practised in ‘Your turn’
- Geography skills: working out a compass direction; analysing a photo and drawings
- Thinking skills: coming up with reasons and explanations

Unit outcomes
By the end of this unit, most pupils should be able to:
- define/explain the terms given in ‘Key vocabulary’ above
- describe the processes of erosion, transport and deposition by the waves
- say that weathering helps to make erosion easier

Resources
For starter 1: beach pebbles; garden stones for comparison; sand
For starter 2: objects found on a beach: shells, pebbles, items washed up from boats
For starter 3 and plenary 1: video of waves at work (eg type sea waves into YouTube)
For starter 5 and plenary 5: see geog 2 resources and planning OxBox CD-ROM

Ideas for a starter
1. Show some rounded beach pebbles (and garden stones for comparison), and sand.
   Ask: Why are the pebbles round? Where do you think they come from originally? Where did the sand come from? Why are the grains so small?
2. Show beach trophies: shells, pebbles, old bits of fishing net from fishing boats.
   Say: I found these on a beach. How did they end up there?
3. Show video of the waves at work.
4. With books closed, write the words erosion, transport, deposition, and their meanings, each on a large sheet of paper. Six pupils hold the sheets up. The class match them.
5. With books closed, display the photo from page 16 of the students’ book. Do you think these waves are affecting this rock? In what way?

Answers to ‘Your turn’
1. They erode, transport and deposit material.
2. hydraulic action, solution, abrasion
3. a. Yes. It is smoother, because any projections on its surface have been worn away through collisions with other pebbles.
   b. attrition
4. a. To stop the beach being eroded away.
   b. Yes; more sand has built up on one side of each groyne (the side facing the waves) than the other; this shows they are working.
   c. I (from the south west); the longshore drift flows past the groynes from that direction, and some of the sand gets trapped.
5. a. south east
   b. A is not sheltered enough. The waves are eroding material.
   c. B is sheltered so sand is deposited.
   d. from the erosion of rocks; at least some would have come from the rocks at A.
   e. No. There are different types of rocks; some are harder, and these erode more slowly than softer rocks do.
   f. Also, wave action around the coast varies, depending on the degree of the places’ exposure to, or shelter from, the winds, as well as other local conditions (tides, currents, etc).

Ideas for plenaries
Plan plenaries for strategic points throughout the lesson, as well as at the end.
1. (If starter 3 not used) Show video of the waves at work.
2. With books closed, pupils write the correct terms for the processes that contribute to erosion, on a spider map on the board. Each nominates another pupil to explain what that term means.
3. Write two headings on the board: The sea    Rivers
   Ask: What work does the sea do, to shape the land? Write erosion/transport/deposition in that column. Now who can remind me of what you learned last year, about the work that rivers do? Is it the same as for the sea? Are there any differences?
4. Who can tell me what weathering is? Do you think it makes erosion harder, or easier? Why is that?
5. Look at the photo on page 17. (You could display it.) What would happen if the groynes weren’t there? Where would the sand go? Where do you think it would end up?
6. Use question 6 in ‘Your turn’ as a plenary.
7. Do you think erosion along the coast is as fast on a calm day as on a windy day? Explain.
8. So is the sea wearing the British Isles away and making them smaller? Discuss.
9. Do you think erosion and deposition could be causing us problems? Discuss.
10. A quickfire test: call out a pupil’s name and a definition (eg for erosion, attrition, hydraulic action). The pupil has five seconds to give you the term.
11. You have one minute to work with a partner and decide on the four key things you learned today. Write them down.

Further class and homework activities
Interactive activities for Unit 2.2 on geog 2 resources and planning OxBox CD-ROM
Worksheet 2A on geog 2 resources and planning OxBox CD-ROM
Suggestions to use at a glance

Worksheet 2A (from the south west); the longshore drift flows past the groynes from that direction, and some of the sand gets trapped.