

CONTENTS



Introduction – The Exam	vii
Section 1	vii
Section 2	viii
1. Maps and Photographs	1
Grid references on maps	1
Scale and measuring distance	3
Directions on maps	5
Area on maps	6
Height on a map	6
How to locate places on photographs	7
Drawing sketch maps	8
Revision checklist	8
Drawing sketch maps from photographs	10
Drawing sketch maps from Ordnance Survey maps	13
Practice exam questions	19
2. The Earth’s Surface	24
The earth’s layers	24
The plates of the earth’s crust	24
Volcanoes	26
Earthquakes	28
Practice exam questions	30
3. Rocks and Soils	32
Types of rock	33
Resources from rocks	35
Soil	36
Practice exam questions	39

4.	Weathering and Erosion.....	41
	Erosion	41
	Weathering	41
	Practice exam questions.....	44
5.	Mass Movement.....	46
	Factors that affect mass movement	47
	Types of mass movement.....	47
	Practice exam question	48
6.	River Processes and Landforms.....	49
	River processes of erosion	50
	River transportation	50
	Stages in a river's course.....	50
	Dams.....	54
	Floods	54
	Advantages of river valleys to people	55
	Practice exam questions.....	55
7.	Glacial Processes and Features.....	57
	The causes of the Ice Age.....	57
	Processes of erosion by ice.....	58
	Features of glacial erosion.....	58
	Some features of glacial deposition	61
	Value of glaciation to people	63
	Problems caused by glaciation	63
	Practice exam question	64
8.	Coastal Processes and Features	65
	Sea erosion.....	65
	Features of sea erosion	66
	Transport of material along the shore	69
	Features of sea deposition	69
	People and the sea	71
	Practice exam questions.....	72
9.	Weather and Atmosphere.....	73
	The atmosphere	73
	How the sun heats the earth	73
	Facts about winds.....	74



Ocean currents	75
Weather	77
Rainfall	78
Irish weather	80
Work at a weather station	80
Hurricanes	83
Cyclones.....	84
Calculating temperatures.....	84
Practice exam questions.....	86

10. Climate 89

Factors that affect climate	89
Climates of the world	90
Water shortage.....	100
Irrigation schemes	102
Acid rain.....	105
Climate change	106
Practice exam questions.....	107

11. Population 111

World population distribution	111
The population cycle.....	112
Factors affecting population growth	113
Future population growth.....	114
Contrasting populations	114
The North and the South	118
Practice exam questions.....	120

12. Migration 123

Migration in Ireland	123
Irish migration to Britain and the USA.....	125
Organised migration.....	125
Population distribution in Sweden	128
Practice exam questions.....	130

13. Settlements 131

Locations of Irish settlements.....	131
Patterns of Irish towns.....	131
Settlement patterns on the Dutch polders	132
Functions of nucleated settlements.....	134

Classification of settlements by function	134
Functions change over time	137
Movement, communications links and the development of settlements	138
Practice exam questions.....	141

14. Urbanisation – Cities in the Developed and Developing World 142

The development of Dublin	142
Functional zones in New York City	144
Functional zones in Irish cities	144
Urban problems.....	147
Solutions to some urban problems.....	148
Problems in cities of the developing world	149
Practice exam questions.....	150

15. Economic Inequality 153

Factors that slow economic development	153
Some solutions to North/South inequalities.....	155
International aid to the South	155
Economic inequality in Ireland	157
Economic inequality in Italy.....	157
Practice exam questions.....	158

16. Economic Activities 161

Oil exploration	161
Peat production in the midlands	164
Fishing – over-exploitation of a resource	165
Farming – a primary activity	167
Practice exam questions.....	169

17. Industrial Activities 172

Economic development	172
Manufacturing industry	173
Light industry as a system	174
Heavy industry as a system	176
Industrial locations – a change over time	178
Women in industry	179
Effects of industry on agriculture, forestry, tourism and the environment	180
Practice exam question	182

4

Weathering and Erosion

aims

You need to know about:

- types of weathering
- limestone features
- acid rain.

Erosion

key point

Erosion is the **breaking down** of rock and the **carrying away** of rock particles by moving water, moving ice and wind. It involves the erosion, transport and deposit of rock particles.

Weathering

Agents of mechanical weathering:

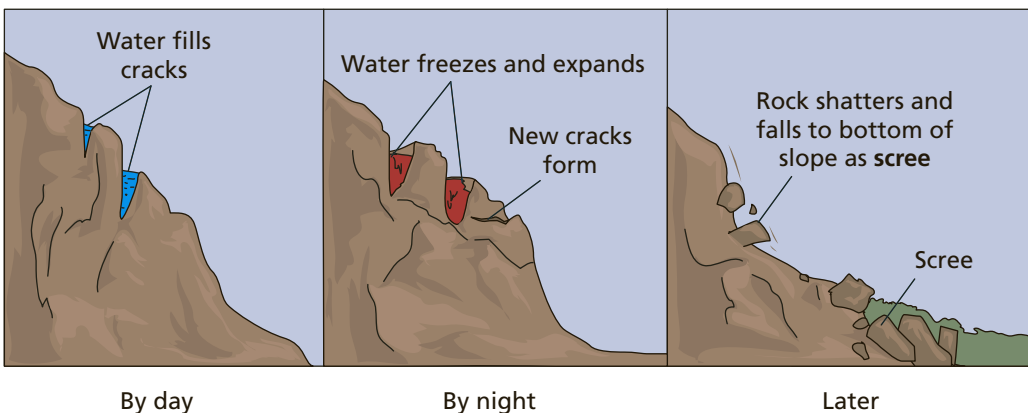
1. frost
2. sudden temperature change
3. plants and animals.

Agent of chemical weathering: rain

key point

Weathering is the breaking down of rocks. There are two types of weathering: **mechanical** and **chemical**.

Frost action



Frost action is also called **freeze-thaw**. In high mountain areas where rain falls, water collects by day in cracks in rocks. At night, the temperature drops and the water freezes and expands, so splitting the rocks. On steep slopes, this loose rock falls downslope and collects as loose heaps of rock. This is known as **scree**.

Examples: Macgillycuddy's Reeks and the Alps.

Chemical weathering



Question: Name the rock type in the Burren in Co. Clare and explain how it weathers.

Answer: Limestone.

Weathering:

1. Rain passing through the atmosphere joins with carbon dioxide to form a weak carbonic acid ($\text{H}_2\text{O} + \text{CO}_2 \rightarrow \text{H}_2\text{CO}_3$).
2. This acid dissolves limestone and the water washes it away.
3. Limestone is permeable, so the rainwater passes through its vertical joints and bedding planes.
4. This makes the cracks in the limestone wider. In this way, limestone pavement (grikes and clints) is formed on the surface.
5. Caverns, stalactites, stalagmites, pillars, curtains and passages are formed underground.

key
point

Chemical weathering occurs on limestone due to the effects of carbonic acid. It forms a **karst** landscape.

Case study: The Burren, Co. Clare

Definitions

Karst: **Karst landscapes** form where limestone is exposed at the surface, e.g. the Burren in Co. Clare.

Cavern: a large underground chamber in a limestone region dissolved by rainwater.

Stalactite: a slender column of calcite which hangs from a cavern ceiling.

Stalagmite: a thick column of calcite which forms on a cavern floor directly underneath a stalactite.

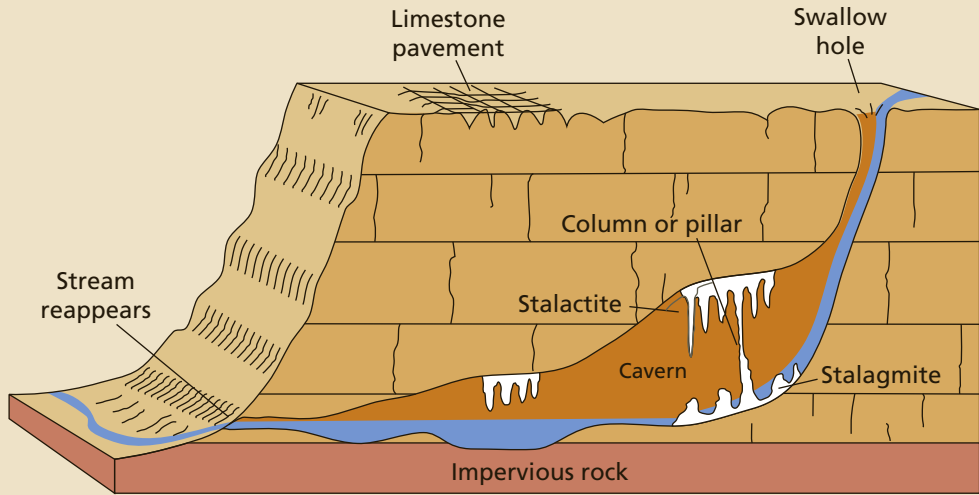
Pillar: a column of calcite in a limestone cavern formed when a stalactite and a stalagmite join together.

Curtain: a continuous sheet of calcite formed when rainwater drips from a crack in a cavern roof.

Passages: long tunnels formed by underground streams.

Joints: vertical cracks in the limestone layers.

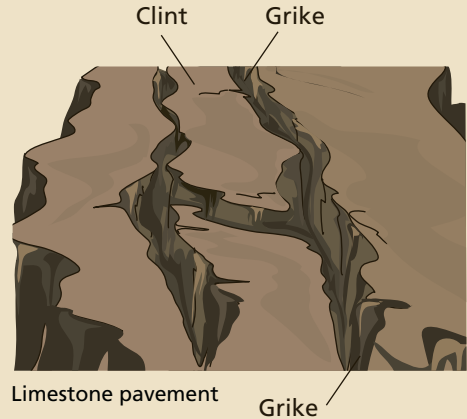
Bedding planes: horizontal cracks that separate the limestone layers.



Features of a limestone or karst region

Burren attractions

1. Tourists admire the bleak karst landscape with its unspoilt scenery, e.g. Mullaghmore.
2. Geologists study the rock formations, e.g. limestone pavement.
3. Historians examine the ancient settlements in the Burren, e.g. dolmens and forts.
4. Botanists study the many rare Alpine flowers, e.g. gentian.



SOME KEY WORDS

Types of weathering

mechanical weathering
chemical weathering
freeze-thaw
scree
carbonic action
karst landscape
limestone pavement

Surface limestone features

limestone pavement
grikes and clints
swallow/sink holes

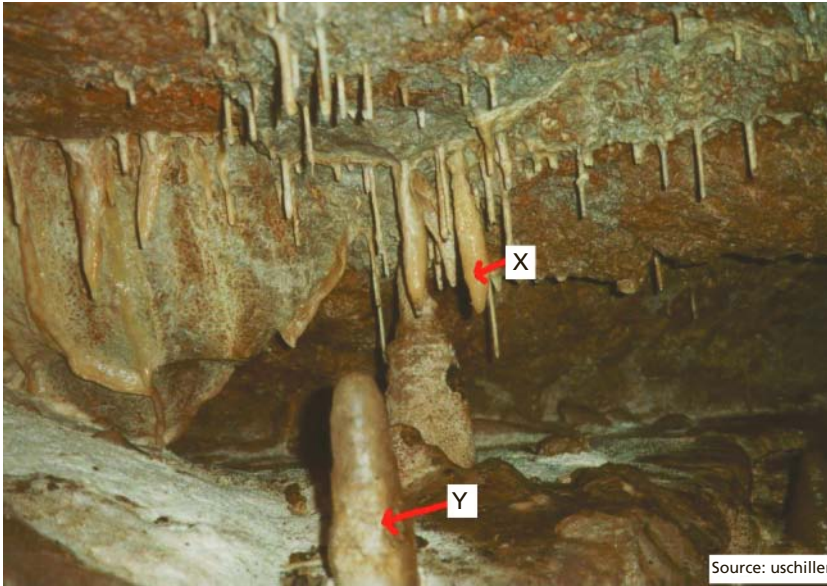
Underground limestone features

caverns
stalactites
stalagmites
pillars
bedding planes
joints

Practice exam questions

1. An Irish cave

Examine the photograph of a cave in Ireland.



- (i) What type of rock is shown? (1)
- (ii) Identify the feature labelled X and the feature labelled Y. (2)
- (iii) Describe fully how the rock shown in the photograph is weathered by rainwater. (7)

(Question 4A, Section 2, JC Higher level, 2008)

2. The Burren

The diagram shows underground features in a karst region.

