Teacher's Resource Book

Geography Now!

New Junior Cycle

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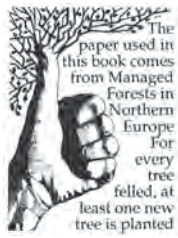

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Contents

Introduction

The **Junior Cycle Geography** syllabus, introduced in 2018, is part of the new Junior Cycle. The Junior Cycle, covering all subject areas for 12–16 year olds, aims to place 'the needs of students at the core of teaching and learning'. Our *Geography Now!* series – textbook, student activity book, student graphic organiser and teacher's resource book – do this in a clear and integrated way that puts students and their learning at the heart of the subject.

The *Geography Now!* textbook is split into three sections, to match the strands of the Junior Cycle Geography syllabus:

- Exploring the Physical World
- Exploring How We Interact with the Physical World
- Exploring People, Place and Change.

Many topics are interlinked – both within the strands and across them; where topics fit neatly together, a chapter might look at more than one learning outcome from one or more strands. The learning outcomes for each chapter are listed at the beginning of the chapter; where the chapter's topics contribute to but do not entirely deal with a learning outcome, we note that also.

The forty chapters have a wide mix of information and learning activities. The learning activities check the students' **understanding** (through questions), **application of knowledge** (e.g. through map reading), **ability to research** (to facilitate active and inquiry-based learning), **comprehension** (through extracting information from real-life sources), and **discussion** and **debate** (to develop their oral literacy skills, to listen to each other's views and formulate and explain their own opinions). Each activity is linked to at least one of the key skills.

This Teacher's Resource Book is an essential part of the package of the *Geography Now!* series. Any new course presents challenges to teachers both in fulfilling the aims of the course and in the completion of the course in the allotted time. The first part of this book looks at the Junior Cycle Geography specification and the main body of the book looks at each chapter in turn.

Together, the four books will provide a comprehensive teaching and learning experience that will ignite students' interest in geography and the world around them and will teach them what it means to be **geoliterate**.

Geography Now! textbook

Each of the forty chapters of the textbook has a range of learning approaches and learning activities. The chapters follow a similar format so that the students become familiar with what is expected of them.

- Learning outcomes – how the chapter matches the expectations of the syllabus
- Learning intentions – a summary list of what the student will learn from the chapter, using action verbs and language that they will immediately understand
- Key terms – the main terms that the student will learn from the chapter
- Clear text
- Relevant and informative photos and diagrams
- Learning activities – to aid understanding, consolidate new information, help the student assess their own understanding and take responsibility for their learning
- A summary exercise – an opportunity for students to check that they have understood the main terms of the topics.

The following visual signposting is used in each chapter:

– an activity for the students to undertake

The icons on the learning activities let the students know which key skill they are applying to the question:

– Curiosity: managing information and thinking

– Numeracy: being numerate

– Literacy: being literate

– Creativity: being creative

– Communicating

– Co-operating: working with others

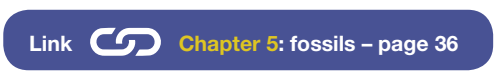
– Reflecting: managing myself

– Responsibility: staying well

There may be one of two icons in the bottom right corner of a learning activity:

Think-Pair-Share. These learning activities are designed for two students working together, where they will first think of their own answer/response to the question, and then discuss ideas, come to conclusions and share their findings with the rest of the class. Teachers can choose whether the sharing is in the form of each pair giving their answer out loud, by asking volunteers to give their answers, or by asking specific students to share their answers.

Pair work or groupwork. Two or more students will work together to discuss a subject, research a topic, share work or create a presentation, poster or podcast. These questions give students the opportunity of working in small teams to develop the skill of working with others.



Links to other chapters or, occasionally, other subjects such as Science.

Some chapters build on the knowledge of other chapters, but teachers do not have to work through the book in a linear way.

Running through all chapters are the themes of geoliteracy, graphicacy and sustainability.

Digital Resources

The *Geography Now!* digital resources will enhance classroom learning by encouraging student participation and engagement. They support the New Junior Cycle Specification's emphasis on the use of modern technology in the classroom and are designed to cater for different learning styles.

To provide guidance for the integration of digital resources in the classroom and to aid lesson planning, they are **referenced throughout the textbook** using the following icons:

- **Student website** – **www.edco.ie/geographynow** – with interactive activities and quizzes
- A series of stimulating **videos**, covering a variety of different topics, allows students to observe geography in action
- **Animations** bring key diagrams from the textbook to life and reinforce the topic at hand
- **PowerPoint** presentations provide a summary of key chapters of the student textbook, highlighting main themes and topics.

Teachers can access the *Geography Now!* digital resources – which also includes **editable lesson plans** – via the *Geography Now!* interactive e-book, which is available online at **www.edcolearning.ie**.

Activity Book

The student Activity Book has a chapter to accompany each of the forty chapters in the textbook. At the beginning of the chapter there is an **anticipation exercise** that contains a number of statements about the topics in the chapter. The student can tick the relevant column to say that they know about the statement already, or they need to learn about it. It acts as an introduction to the topic, lets the student know what they are about to learn and builds curiosity about the subject.

Apart from this anticipation exercise, students will usually work through the Activity Book questions once they have completed the chapter. Alternatively, teachers may choose to ask them to complete parts of it as they are working through the topic. Questions are written for students to answer on their own so that the Activity Book is a **personal record of learning**.

Each chapter has a **matching exercise** to check understanding of terminology. This is generally followed by a **key terms activity**, such as a crossword, that further checks vocabulary. Then there is a **range of activities** such as single-answer questions, definition questions, opinion questions – to check knowledge learned and to consolidate learning.

At the end of each chapter, the student is asked to do a **self-assessment**. This acts as a reminder of the contents of the chapter and also requires the student to really think about whether they really understand the topic. They use a traffic-light system, i.e. they tick:

- Green to indicate they understand the topic fully
- Orange to indicate they understand most of the topic but still have some questions
- Red to indicate they are struggling with the topic and need help with it.

The student will be asked to create a **mind map** or other visual aid of the chapter's subject as a reminder of what they have learned and to consolidate and revise that learning.

As a final exercise, the student should complete an end of chapter reflection (there is a template on page 000 of this book), which in conjunction with the self-assessment should be used as a basis for the student and their teacher to create an action plan for further study of the topics in the chapter.

Graphic organiser

The *Graphic Organiser* is especially helpful to students that learn in a visual way. Students can map out their ideas/thoughts in a very easy and logical manner that teachers can assess formatively and give feedback to the student. The graphic organiser is for the student's own personal use to use as and when they wish, although teachers might want to guide students on suitable occasions for using it (see pages ii and iii of the *Graphic Organiser* for some suggestions).

Teacher's Resource Book

In this book we provide:

- An overview of the new Junior Cycle
- An overview of the key skills within the Junior Cycle framework, and how *Geography Now!* addresses them
- A list of statements of learning (SOLs) that are specific to Junior Cycle Geography
- A list of learning outcomes, as provided by the National Council for Curriculum and Assessment, and the chapters in which we address them
- A list of action verbs and their meanings, as used in learning outcomes, learning intentions and learning activity questions and as defined by the National Council for Curriculum and Assessment
- An explanation of geoliteracy and how it relates to the syllabus
- Examples of plans for teaching the course in a non-linear way
- Information on assessment for the Junior Cycle Geography certificate.

There is a chapter to match each of those in the textbook/Activity Book. They each follow the same format:

- An overview of what students will be leaning in the chapter
- The learning outcomes and the statements of learning covered
- The key terms for the chapter
- A reminder to ask students to look at the anticipation exercise in their Activity Book
- Classroom demonstration/experiment (where applicable)
- Link to fieldwork activity for third-year CBA (where applicable)
- Answers/suggestions on how to assess each question in the textbook
- Answers for each question in the Activity Book
- Some chapters have additional activities for early finishers who will use these activities for learning reinforcement
- Suggested resources – videos and websites.

There is an appendix that contains:

- Presentation Assessment sheet, giving pointers on how to assess students' presentations/blog posts/articles/posters/podcasts.

At the end of the book, there are photocopiable sheets which teachers are free to use as handouts if applicable.

- Photocopiables relating to specific questions in the textbook and Activity Book
- A placemat template (for how to use this, search on the internet for "PDST placemat technique")
- A fishbone diagram template (for how to use this, search on the internet for "PDST fishbone template")
- End of chapter reflection – to give students when they have finished the textbook chapter and its corresponding chapter in the Activity Book
- A template for a KWHL chart (for an explanation, see page 000)
- A self-assessment/peer assessment template for teachers to use as they deem appropriate.

Contents for the *Geography Now!* series of books

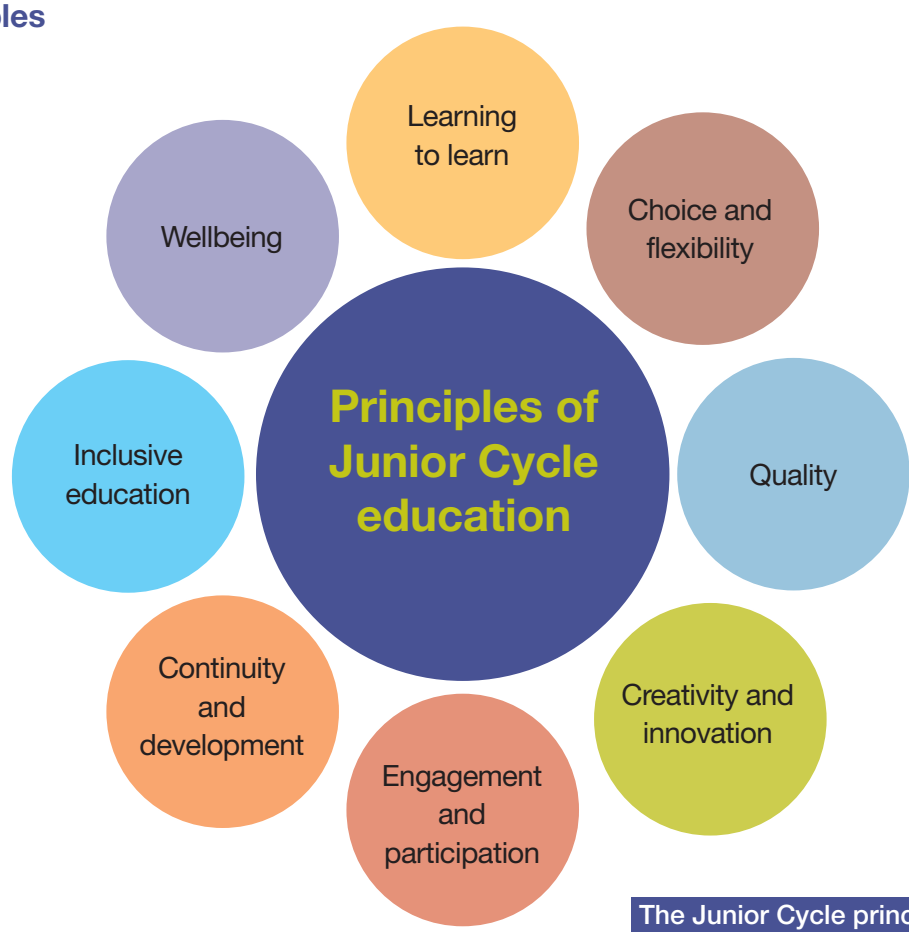
The Junior Cycle

The Junior Cycle specifications for all subjects take an integrated approach to learning. As well as subject-specific learning, students are guided to develop a wide range of skills and thinking abilities.

The range of subjects in the Junior Cycle are based on:

- Eight principles
- Eight key skills
- Twenty-four statements of learning.

The principles



The Junior Cycle principles

The eight principles shown in this diagram and outlined below are applicable to all subjects across the Junior Cycle.

Learning to learn – supporting independent learning that students can carry on with in their lives after schooling.

Choice and flexibility – providing a wide choice of learning experiences to meet the needs of all students.

Quality – offering a high quality of education.

Creativity and innovation – providing opportunities within learning.

Engagement and participation – designed to give students a sense of inclusiveness and the confidence to take an active role in their community.

Continuity and development – helping students build on their previous learning and experiences and enabling them to progress.

Inclusive education – including all students and providing equality of opportunity, participation and outcome.

Wellbeing – ensuring that the learning experience contributes to the physical, mental, emotional and social wellbeing of all students.

All eight principles underpin the text and activities in *Geography Now!* and the accompanying student Activity Book.

The key skills

The Junior Cycle key skills

The eight key skills in the diagram and outlined below are relevant to all school subjects.

Managing information and thinking – being organised, observant, applying critical thought, researching.

Being numerate – carrying out calculations, gathering and analysing information.

Being literate – reading, writing, speaking; being clear and accurate when writing answers to questions, creating posters and speaking in class.

Being creative – exploring options, having ideas, imparting knowledge using a range of media, such as posters, infographics, videos, podcasts and digital presentations.

Communicating – presenting information, listening, expressing ideas and opinions, using digital technologies to find and impart information.

Working with others – developing good relationships, dealing with conflict, co-operating, being respectful, helping each other, being part of a team.

Managing myself – making decisions, setting goals, organising work, reflecting on learning, self-assessment and knowing where and how to find information.

Staying well – being healthy, physically active, social, confident, being responsible and ethical.

Every activity in the textbook is linked to one or more of the key skills listed above. The link is noted on the activity in the textbook and in this Teacher's Resource Book. Some activities might cover more key skills than we have noted, depending on how they are carried out. We indicate the key skills by the following codes:

Key skill	Textbook*	Teacher's Resource Book
Managing information and thinking	Curiosity	MIT
Being numerate	Numeracy	BN
Being literate	Literacy	BL
Being creative	Creativity	BC
Communicating	Communicating	C
Working with others	Co-operating	WwO
Managing myself	Reflecting	MM
Staying well	Responsibility	SW

*See page iv for the corresponding icons.

Statements of learning

The learning at the core of the Junior Cycle is expressed in twenty-four statements of learning. Not all the statements apply to geography and some are only touched on. The specific ones that are listed by the National Council for Curriculum and Assessment as relevant to geography are:

SOL 6: The student appreciates and respects how diverse values, beliefs and traditions have contributed to the communities and culture in which she/he lives.

SOL 7: The student values what it means to be an active citizen, with rights and responsibilities in local and wider contexts.

SOL 8: The student values local, national, and international heritage, understands the importance of the relationship between past and current events and the forces that drive change.

SOL 9: The student understands the origins and impacts of social, economic, and environmental aspects of the world around her/him.

SOL 10: The student has the awareness, knowledge, skills, values and motivation to live sustainably.

SOL 16: The student describes, illustrates, interprets, predicts, and explains patterns and relationships.

SOL 18: The student observes and evaluates empirical events and processes and draws valid deductions and conclusions.

In the TRB, each question from the textbook notes the SOL from the above list that the question covers.

Other SOLs are relevant but not assigned to specific learning activities, such as:

SOL 1: The student communicates effectively using a variety of means in a range of contexts in L1.

SOL 3: The student creates, appreciates and critically interprets a wide range of texts.

SOL 5: The student has an awareness of personal values and an understanding of the process of moral decision-making.

SOL 15: The student recognises the potential uses of mathematical knowledge, skills and understanding in all areas of learning.

SOL 19: The student values the role and contribution of science and technology to society, and their personal, social and global importance.

SOL 24: The student uses technology and digital media tools to learn, communicate, work and think collaboratively and creatively in a responsible and ethical manner.

Learning outcomes

All the learning outcomes are examined within the context of the following elements:

- Processes, patterns, systems and scale
- Geographic skills
- Sustainability.

The learning outcomes are given below, together with the chapter numbers in which we address them and in which the student is working towards them without explicitly addressing them.

LO	Students should be able to ...	Addressed in chapter:	Working towards in chapter:
Strand one: Exploring the Physical World			
1.1	describe the formation and global distribution of volcanoes, earthquakes, and fold mountains in the context of plate tectonics and structure of the Earth	1, 2, 3, 4	
1.2	distinguish between different categories of rock type, referring to composition and formation	5	
1.3	analyse the processes and effects of weathering and mass movement on our landscape	8, 9	
1.4	assess a soil type in a local area in relation to composition and vegetation	13	
1.5	explain how the processes of erosion, deposition and transportation shape our fluvial, marine, and glacial landscapes	10, 11, 12	
1.6	classify global climates, and analyse the factors that influence the climate in Ireland	15, 16, 17	
1.7	investigate the formation and behaviour of a significant weather event	19	
1.8	gather, record and interpret weather data	16, 17, 18	19
1.9	differentiate between the types of energy resources produced by the physical world	23	3, 22
1.10	investigate a range of physical processes active in a chosen location and the connections between them	7, 21	1, 3, 4, 10, 11, 12
Strand two: Exploring How We Interact with the Physical World			
2.1	describe the economic and social impacts of how we interact with the occurrence of volcanoes, earthquakes, and fold mountains	2, 3, 4	
2.2	evaluate the environmental, economic, and social consequences of rock exploitation and energy resources	23	
2.3	identify how the physical landscape influences the development of primary activities	13, 14, 22, 24, 25, 26	2, 3
2.4	assess the exploitation of water, fish stocks, forestry, and soil as natural resources	25	10, 11, 13
2.5	describe a local secondary activity in relation to its function and the factors that influence its location	37	
2.6	examine the causes and implications of climate change	20	16, 17
2.7	investigate examples of how people interact with and manage surface processes		3, 4, 10, 11
2.8	investigate how people respond to a natural disaster		3, 4
2.9	assess the interrelationships between the physical world, tourism and transport	24, 38	3, 8, 21

LO	Students should be able to ...	Addressed in chapter:	Working towards in chapter:
Strand three: Exploring People, Place and Change			
3.1	use the demographic transition model to explain populations' characteristics and how populations change	27, 28, 30	
3.2	investigate the causes and consequences of migration	29	
3.3	examine population change in Ireland and in a developing country	29	
3.4	consider the factors affecting the location and origin of rural and urban settlement in Ireland	34	
3.5	examine the causes and effects of urban change in an Irish town or city	35	
3.6	identify global patterns of economic development	36	
3.7	compare life chances for a young person in relation to gender equality, health care, employment and education opportunities in a developed and a developing country	31, 32, 33	
3.8	evaluate the role of development assistance on human development	39	
3.9	synthesise their learning of population, settlement and human development within the process of globalisation	40	

Note that although chapter 6, Maps and photographs (including satellite images) are not referenced directly in the learning outcomes, the skills learned in that chapter are applied in the learning outcomes throughout the book.

Action verbs

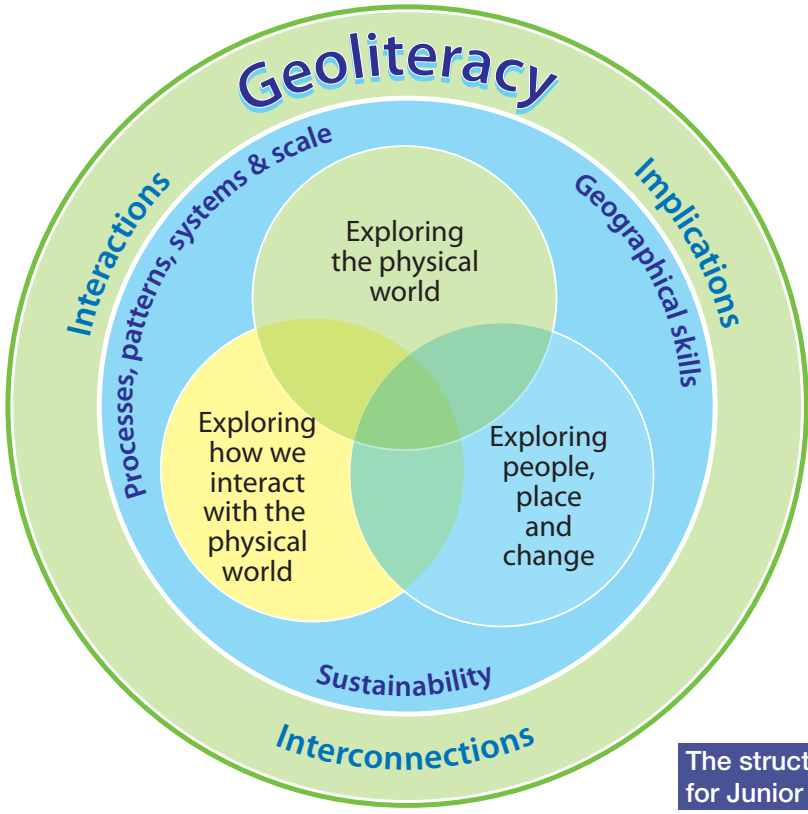
Action verbs are at the core of learning outcomes and learning intentions. In *Geography Now!* we have used **active** action verbs, not only for the learning intentions but also in the majority of questions in the learning activities in the textbook and the consolidation activities in the students' Activity Book. The following list explains, using definitions from the Geography specification, the action verbs students will encounter. Each action verb is described in terms of what is required of the learner in the activities, and what they should be able to do once they have achieved the learning outcome or intention.

Action verbs	Students should be able to
Analyse	study or examine something in detail, break down in order to bring out the essential elements or structure; identify parts and relationships, and to interpret information to reach conclusions
Apply	select and use information and/or knowledge and understanding to explain a given situation or real circumstances
Assess	judge, evaluate or estimate the nature, ability, or quality of something
Calculate	obtain a numerical answer showing the relevant stages in the working
Classify	group things based on common characteristics
Compare	give an account of the similarities and/or differences between two (or more) items or situations, referring to both/all of them throughout
Complete	finish making or doing; bring to a successful conclusion
Conduct	organise and carry out
Consider	describe patterns in data; use knowledge and understanding to interpret patterns, make predictions and check reliability
Construct	develop information in a diagrammatic or logical form; not by factual recall but by analogy or by using and putting together information
Debate	argue about a subject, especially in a formal manner
Demonstrate	prove or make clear by reasoning or evidence, illustrating with examples or practical application
Describe	develop a detailed picture or image of, for example a structure or a process, using words or diagrams where appropriate; produce a plan, simulation or model
Determine	ascertain or establish exactly by research or calculation
Differentiate	recognise or ascertain what makes something different

Action verbs	Students should be able to
Discuss	offer a considered, balanced review that includes a range of arguments, factors or hypotheses; opinions or conclusions should be presented clearly and supported by appropriate evidence
Distinguish	make the differences between two or more concepts or items clear
Evaluate (ethical judgement)	collect and examine evidence to make judgments and appraisals; describe how evidence supports or does not support a judgement; identify the limitations of evidence in conclusions; make judgments about ideas, solutions or methods
Explain	give a detailed account, including reasons or causes
Examine	consider an argument or concept in a way that uncovers the assumptions and relationships of the issue
Identify	recognise patterns, facts, or details; provide an answer from a number of possibilities; recognise and state briefly a distinguishing fact or feature
Investigate	observe, study, or make a detailed and systematic examination in order to establish facts and reach new conclusions
Interpret	use knowledge and understanding to recognise trends and draw conclusions from given information
Justify	give valid reasons or evidence to support an answer or conclusion
Monitor	observe and check the progress of something over a period of time; keep under systematic review
Predict	give an expected result of an event; explain a new event based on observations or information using logical connections between pieces of information
Prepare	make something ready for use or presentation
Present	promote or propose an idea; deliver or illustrate evidence; show something for others to examine
Propose	put forward a plan or suggestion for consideration
Recommend	put forward something with approval as being suitable for a particular purpose
Recognise	identify facts, characteristics or concepts that are critical (relevant/appropriate) to the understanding of a situation, event, process or phenomena
Relate	associate, giving reasons
State	provide a concise statement with little or no supporting argument
Suggest	propose a solution, hypothesis or other possible answer
Synthesise	to draw together, in written or other form, different ideas, data, information and/or knowledge to create a new idea or deeper understanding
Use	apply knowledge or rules to put theory into practice
Verify	give evidence to support the truth of a statement

Geoliteracy

Geography is the starting point for our understanding of the world around us. The world has become in many ways a smaller place. Technological advances, the internet, the ease of inter-continental travel, the rapid spread of information and culture through media, and global economic interdependence have all worked to bind the global community more closely together. The study of geography provides an excellent lens through which students can study global issues and face up to the necessity of a sustainable culture in the future.



The structure of the specification for Junior Cycle Geography

The new Junior Cycle specification is based on the concept of **geoliteracy**. This requires not only knowledge of geography but a range of skills. The idea behind geoliteracy is that we begin to use geographic **understanding**, geographic **thinking** and geographic **reasoning** to make far-reaching decisions. It consists of three components: interactions, interconnections and implications (the *three 'I's*):

Interactions are how the world works in terms of systems, both physical and human. It involves understanding how humans interact with the environment. Students will study such topics as soil and food supply or the distribution of natural resources and manufacturing. A geoliterate student will be able to make informed decisions about the sustainable use of these resources.

Interconnections describe how the planet is connected through these systems. It is about how something happening in one area can have an impact on both neighbouring and distant places. Students will study such topics as wind systems, ocean currents, global warming and aid. A geoliterate student will understand how natural events that occur in one region may have an impact on other places and people.

Implications involve the decision-making process. It is about being able to reason how decisions taken at a local, regional or global scale can have an impact that is often far-reaching in terms of time and space. Students will study such topics as urban planning and transport. The study of resource management may involve an examination of how producing oil and gas in remote areas may be environmentally unfriendly and undesirable for communities. A geoliterate student will understand that decisions that we make may have long-lasting effects both for the health of the planet and for communities.

A linear or non-linear approach?

Teachers are aware from their in-service courses that where it is possible and practicable, students should focus on local examples in learning outcomes. A non-linear approach to the teaching of the course is also seen as an important aspiration which teachers may adopt as they gain familiarity with the course over time.

Learning outcomes are covered over three years. What this means in practice is that teachers build on earlier learning from one learning outcome to the next. Teachers use the knowledge that their students have gained from previous learning and may refer back to previous learning outcomes again.

Some examples are given below of units of work which are non-linear to varying degrees in approach and which teachers may find helpful as they proceed through the three-year span of the course.

Teaching and learning plan

This scheme of work suggests the amount of class time that might be allocated to various topics and is listed in a linear fashion. It is not prescriptive and merely follows the order in which the three interconnected strands are listed in the geography curriculum specification.

Term / Year	Year 1	Year 2	Year 3
September–Mid-term (8 weeks approx.)	**Chapters 1–4**	**Chapter 6** (Aerial photographs) **Chapters16–18**	**Chapters 30–33**
Mid-term–Christmas (7 weeks approx.)	**Chapter 5 Chapters 7–9** (excluding OS material)	**Chapter 19–20 Chapter 6** (Satellite images) (Link back to chapters 2–4, 10–12, 19)	**Chapter 34 Classroom-based Assessment 2 Assessment Task**
January–Mid-term (6 weeks approx.)	**Chapters 10–11** (excluding OS material)	**Chapter 21–23** (Chapter 22 – link to chapters 3 and 5)	**Chapters 35–37**
Mid-term–Easter (6 weeks approx.)	**Chapter 12** (excluding OS material) **Chapters 13–15**	**Chapters 23–26 Classroom-based Assessment 1**	**Chapters 38–40**
Easter–June (7 weeks approx.)	**Chapter 6** (OS skills) (Link back to chapters 8-12) **End-of-year review**	**Chapters 27–29 End-of-year review**	**Preparation for examination**

The key point of teaching and learning in is that the students learn about and understand the geographical topics in an integrated manner. This will demonstrate the interrelationship between the various topics and the impact that it has on the student.

For that reason, a non-linear approach using various learning outcomes is desirable. The overall scheme of work should contain several units of learning using a number of learning outcomes with a non-linear approach for each year.

Term / Year	Year 1	Year 2	Year 3
September–Mid-term (8 weeks approx.)			
Mid-term–Christmas (7 weeks approx.)			**Classroom-based Assessment 2 Assessment Task**
January–Mid-term (6 weeks approx.)			
Mid-term– Easter (6 weeks approx.)		**Classroom-based Assessment 1**	
Easter–June (7 weeks approx.)			**Preparation for examination**

Teachers are free to link various chapters in a non-linear way either during the three years or during revision in the second half of students' third year of study. We offer a few examples of areas where teachers can broadly link some aspects of the course material.

Example 1

Content: Theory of plate tectonics (chapters 1–5)

Key concept: Natural hazards pose risks to people and property

Linkage: Tsunami in Japan (chapter 4), Eruptions in Mt St Helens (chapter 3), Ash cloud in Iceland (chapter 3)

Added links: Flooding (chapter 11), Tropical storms (chapter 19), Climate change (chapter 20)

Example 2

Content: Weathering and erosion (chapters 7–12)

Key concept: Rivers have a major impact on human and economic activity

Linkage: Rivers and energy resources (chapter 23), River valleys and farming (chapter 26), River valleys and settlement (chapter 34)

Example 3

Content: Earth's atmosphere and oceans (chapters 15–20)

Key concept: Changing atmospheric conditions impact on people and the environment

Linkage: Coasts (chapter 11), Renewable energy resources (chapter 23), Forestry (chapter 24), Settlement in Ireland (chapter 34), Change in an Irish urban centre (chapter 25)

Example 4

Content: Soils (chapters 13, 14)

Key concept: Soil is an important natural resource

Linkage: Fold mountains (chapter 2), Volcanoes (chapter 3), Primary activities (chapter 26), Forestry (chapter 254)

Example 5

Content: OS maps and photographs (chapter 6)

Key concept: OS maps are an essential resource to understanding surface processes

Linkages: Fold mountains (chapter 2), Karst landscapes (chapter 8), Rivers (chapter 10), The sea (chapter 12), Glaciation (chapter 12), Forestry (chapter 24), Settlement in Ireland (chapter 34), Change in an Irish urban centre (chapter 35)

Example 6

Content: Chapters 27–32; chapters 34–35

Key concept: The imprint of humankind on Earth: population and settlement

Linkages: Volcanoes (chapter 3), Earthquakes (chapter 4), OS maps and photographs (chapter 6), Agents of erosion (chapters 10–12), The greenhouse effect and climate change (chapter 20), Exploiting energy resources (chapter 23), Economic activities (chapter 37), Tourism (chapter 38)

Example 7

Content: Chapters 36–40

Key concept: Economic development is unevenly distributed across the globe

Linkages: OS maps and photographs (chapter 6), Fold mountains (chapter 2), Global climates (chapter 21), Exploiting resources (chapters 23–26)

Other non-linear approaches to topics are given below, with more detail.

Learning plans

Name of unit: The occurrence of volcanoes and the physical, economic and social impacts of volcanic activity in the context of plate tectonics

Key LOs

1.1 Describe the formation and global distribution of volcanoes in the context of plate tectonics and structure of the Earth

1.9 Differentiate between the types of energy resources produced by the physical world

1.10 Investigate a range of physical processes active in a chosen location and the connections between them

2.1 Describe the economic and social impacts of how we interact with the occurrence of volcanoes

Action verbs

Describe / differentiate / investigate (see pages xii/xiii)

Elements

Students will approach the learning outcomes through the lens of the elements. Elements informing the teaching of this unit are: processes, patterns, systems and scale.

- **Processes:** Examine the factors which account for the distribution of volcanoes.
- **Patterns:** Examine plate tectonics in detail on a global scale and show the patterns of volcanoes around the world.
- **Systems:** Examine the economic and social impact of human interaction with volcanoes.
- **Scale:** Study one volcano in detail (local scale).

Geographical skills

- Reading and interpreting a variety of geographical stimuli.
- Organising and interpreting geographic data.
- Examining maps of regions and countries where volcanoes are found.

- Gathering data from a variety of sources – textbook, internet and videos.

Sustainability

- Students will examine the impact of volcanic activity on nearby settlements in relation to risk to life and injury, damage to property and services such as water, sanitation, gas pipes and transport.
- Students will examine one case study of settlement in a volcanic region to focus on the efforts that authorities have made to reduce the impact of volcanic activity.
- Students will examine how the presence of volcanic activity impacts on agriculture, tourism and geothermal energy and in these ways, provide for the livelihood of great numbers of people.

Geoliteracy

- **Interconnections:** Students will learn that the occurrence of volcanoes are related to plate tectonics. They will also discover that fold mountains (chapter 2) and earthquakes (chapter 4) may be found in similar regions and plate edges.
- **Interactions:** Pupils will examine the impact of human interaction with those features, e.g. volcanoes and the risk to life; volcanoes and the development of tourism; volcanic soils and agriculture.
- **Implications:** Students will realise that as the global population grows, people will increasingly occupy regions which are more vulnerable to volcanic activity, earthquakes and landslides, thus placing their futures at risk.

Name of unit: Rivers – a natural resource

Key LOs

1.5 Explain how the processes of erosion, deposition and transportation shape our fluvial landscapes

1.9 Differentiate between the types of energy resources produced by the physical world

1.10 Investigate a range of physical processes active in a chosen location and the connections between them

2.4 Assess the exploitation of water as a natural resource

2.7 Investigate examples of how people interact with and manage surface processes

Action verbs

Explain / differentiate / investigate / assess (see pages xii/xiii)

Elements

Students will approach the learning outcomes through the lens of the elements. Elements informing the teaching of this unit are: processes, patterns, systems and scale.

- **Processes:** Rivers as energy systems – erosion, transportation and deposition.
- **Patterns:** River patterns may be dendritic, trellis or radial.
- **Systems:** River systems drain river basins and in doing so, shape the landscape over time in ways that are common to all river systems.
- **Scale:** Local, national and international in scale.

Geographical skills

- Map work including OS; Atlas physical map of the major rivers of the world.

- Drawing a sketch of the stages of a river.
- Identifying the features of rivers at a river's various stages.
- Asking geographic questions.
- Gathering data from a variety of sources including photographs.
- Tracing the changes in a river over time.
- Examining the importance of rivers as water sources and as power sources for the needs of humankind.

Sustainability

- Consider the relationship between people and rivers.
- Critically reflect on the impact of humankind on water quality in rivers.
- Critically reflect on the importance of rivers for leisure and recreation.
- Critically reflect on the impact of large river dams on river systems.
- Critically reflect on systems of flood control and on the wisdom of building housing estates in flood plains.

Geoliteracy

- **Interconnections:** Students will understand that river systems are part of the natural world. Rivers are part of the natural landscape and are connected to climate, rainfall patterns and rock type. River flow influences fish ecosystems in the ocean beyond the mouth of a river. Rivers influence farming because flood plains are among the most fertile farming regions on earth.
- **Interactions:** Students will understand that people interact with river systems for transportation, water sources and for hydroelectricity production and that this has consequences for the natural world.
- **Implications:** This involves decision making processes. Students will understand that rivers can be used and abused by people especially when large settlements have grown along river banks. People's decisions in relation to dams and water use have implication for the natural processes of a river and for its health as an ecosystem.

Name of unit: People and energy resources

Key LOs

1.9 Differentiate between the types of energy resources produced by the physical world (chapter 22)

2.2 Evaluate the environmental, economic and social consequences of rock exploitation and energy resources (chapter 23)

2.6 Examine the causes and implications of climate change (chapter 20)

Action verbs

Differentiate/evaluate/examine (see pages xii/xiii)

Elements

Students will approach the learning outcomes through the lens of the elements. Elements informing the teaching of this unit are: processes, patterns, systems and scale.

- **Processes:** Examine the processes by which energy resources are exploited, locally, nationally and globally.

- **Patterns:** Examine the patterns of international trade in energy resources.
- **Systems:** Identify some regions where exploitation of energy resources occurs.
- **Scale:** Identify the environmental impact of the burning of fossil fuels.

Geographical skills

- Reading and interpreting a variety of geographical stimuli.
- Organising and interpreting geographic data.
- Examining maps of regions and countries where the resources examined in the named chapters are found.
- Gathering data from a variety of sources – textbook, internet and videos.

Sustainability

- Consider the relationship between people and energy resources.
- Consider the long-term environmental effects of the burning of fossil fuels.
- Consider the food, water and other needs of the large settlements in the desert region of the Persian Gulf where oil and gas production occur.
- Critically reflect on the sustainability of continued inward migration of people from all over the world to the desert conditions of the Gulf regions.

Geoliteracy

- **Interconnections:** Students will learn that the exploitation of energy resources leads to patterns of global trade and to settlement and to inward migration in the Persian Gulf; pupils will learn that the oil trade is global in scale and that climate change is a global issue
- **Interactions:** Pupils will realise the impact of human interaction with oil/gas resources in the Persian Gulf
- **Implications:** Students will realise that burning fossil fuels leads to global warming and climate change and that carbon free energy is vital for the health of Planet Earth.

Name of unit: Settlement – Hamlets/villages to large cities

Key LOs

3.4 Consider the factors affecting the location and origin of rural and urban settlement in Ireland (chapter 34)

3.5 Examine the causes and effects of urban change in an Irish town or city (chapter 35)

Action verbs

Consider/ examine (see pages xii/xiii)

Elements

Students will approach the learning outcomes through the lens of the elements. The elements informing the teaching of this unit are: processes, patterns, systems and scale.

- **Patterns:** Settlement patterns in rural Ireland
- **Systems:** Urban centres have many things in common such as the CBD, functional zones, green spaces
- **Scale:** local and national in Ireland

Geographic skills

- Map work including OS; Atlas map of Irish urban settlement.
- Drawing a sketch of the local village/town/city.
- Census figures of urban and rural population growth over time in Ireland.
- Asking geographic questions.
- Gathering data from a variety of sources.
- Tracing the growth of a settlement over time.

Sustainability

- Consider the relationship between people and the rural landscape.
- Critically reflect on the impact of different patterns of rural settlement on the environment.
- Critically reflect on causes and solutions to urban traffic congestion.
- Critically reflect on urban sprawl and urban decay.
- Consider that a housing crisis has developed in larger urban centres in Ireland and that many people can no longer afford to live in the capital city of the Republic of Ireland.

Geoliteracy

- **Interconnections:** Students will understand that urban centres grow in preferred locations such along river valleys and river banks, sheltered harbours, gaps in upland areas and dry point sites
- **Interactions:** Students will understand that settlements do not develop in isolation and that transport networks, such as road and rail, link settlements and help them to grow
- **Implications:** Dublin is far and away the largest city in Ireland and this has implications for the balanced development of urban centres in the rest of the country.

Name of unit: Secondary activity and the growth of urban centres

Key LOs

2.5 Describe a local secondary activity in relation to its function and the factors that influence its location

3.5 Examine the causes and effects of urban change in an Irish town or city

Elements

Students will approach the learning outcomes through the lens of the elements. The elements informing the teaching of this unit are: processes, patterns, systems and scale.

- **Processes:** The inputs, processes and outputs in the chosen manufacturing plant.
- **Systems:** A broad awareness of the place of the urban centre within the Irish urban system. Where is the local urban centre within the hierarchy of the urban system in Ireland?
- **Scale:** Local and national scale.

Geographic skills

- Reading and interpreting a variety of geographical stimuli.
- Map work including OS.
- The study of aerial photography of towns including satellite photography.
- Drawing a sketch of the local town/city.

- Examination of the change in census figures of the local urban centre.
- Tracing the growth of the local settlement over time.
- Asking geographic questions.

Sustainability

- Consider the relationship between people and manufacturing.
- Consider the environmental impact of the processing of manufactured products in the local plant in reference to air quality, water requirements, waste, traffic in and out of the plant, energy requirements.
- Reflect on the positive impact of the plant on employment and quality of life in the town/city.
- Critically reflect on the long-term prospects of the plant for the town/city.

Geoliteracy

- **Interconnections:** Students will understand that employment generated in a local secondary activity directly and indirectly leads to the growth of employment in the town/city
- **Interactions:** Students will understand that the growth of the town/city leads to greater interaction with other urban centres through employment and improved transport links
- **Implications:** Students will understand that increased employment and urban growth has implications for housing, the development of services and traffic both within and in the vicinity of the town.

Assessment

Assessment is an essential element of the teaching and learning cycle. It enables the students to know how they are progressing and how they might improve. Assessment enables teachers to gather evidence and make judgements about student achievement. However, the main aim of assessment should be to give feedback to students and to help them to progress in their learning.

These are three main purposes of assessment: assessment ***for*** learning, assessment ***as*** learning and assessment ***of*** learning.

Assessment *for* learning

Assessment *for* learning, also known as **formative assessment**, is concerned with the monitoring of students' learning to provide ongoing feedback that can be used by teachers and students to make learning more effective.

- It helps both teachers and students to realise what has been learned.
- It helps students to identify their strengths and weaknesses.
- It helps teachers to identify any problems that their current learning process may have, and which areas of study may require further work.

Formative assessment happens during the learning process and should take place on an almost daily basis rather than at the end. It typically involves giving attention to small sections of learning. Its key purpose is to improve students' learning rather than for grading students' achievements of learning outcomes. Formative assessment is most effective when it moves beyond grades and focuses not just on how the student has performed in the past but on future learning.

Formative assessment should be distinguished from continuous assessment, which refers to the assessment of a student's ongoing work but may not involve any feedback to help promote better teaching and learning.

Assessment *as* learning

Assessment *as* learning occurs where students are actively encouraged to engage in the assessment process. This can be through either self-assessment or peer assessment. Assessment as learning:

- Encourages students to take responsibility for their own learning
- Requires students to ask questions about their learning and encourages reflection
- Helps students to validate and question their own thinking, and to become comfortable with the uncertainty that is inevitable in learning anything new
- Creates an environment where it is safe for students to take risks and where support is readily available.

Assessment as learning should begin as soon as students are aware of the goals that have been set for a piece of learning and should occur throughout the learning process. It implies that students take ownership of and responsibility for moving the learning process forward.

In *Geography Now!* we have included some learning activities where students are specifically asked to provide self-assessment or peer assessment by completing questions in their Activity Book. We also provide a photocopiable self-assessment/peer assessment sheet that teachers can give students on other occasions at their discretion (page 000).

Assessment *of* learning

Assessment *of* learning, also known as, **summative assessment**, is about summarising how much learning has taken place. It is a middle-term or long-term summing up of progress. Examples of summative assessments include a mid-term examination, a project, an end-of-course examination. Summative assessment:

- Usually takes place at the completion of a significant unit or period of learning
- Is used to rank or grade students
- Compares one student's achievement with (in-house or national) standards
- Includes assessment for the Junior Cycle Profile of Achievement (see page xxvi).

Assessment strategies

Both the textbook and student Activity Book of *Geography Now!* incorporate a wide range of assessment and self-assessment strategies. These include:

Learning activities asking students to carry out self-assessment/peer assessment.

Think-Pair-Share learning activities, where students think of an answer themselves and then discuss it with their partner, thus having the opportunity to self-assess and change their thinking before sharing with the rest of the class or hearing other students' answers.

Comparing answers with other students. Although this is not overtly self-assessing, this will be a natural outcome.

Reviewing other students' work – posters, presentations, etc. – and thinking about how they can incorporate what they consider good practice into their future work.

Anticipation exercises for each chapter, where students need to think about what they know about a topic. Teachers may like to ask students to complete these in pairs, so that students can develop their literacy skills and learn to be comfortable admitting they know nothing about a specific topic.

Revisiting the anticipation exercises once a chapter is finished, to think about the statement again and assess whether they now understand it.

Completing an end-of-chapter self-assessment based on the traffic-light system, where students can indicate how well they understand the material presented in the chapter; teachers need to review this self-assessment to help students plan further learning.

End-of-chapter reflection, for which there is a photocopiable template (page 000) for teachers to give students at the end of each chapter (or series of chapters, or strand, as the teacher deems appropriate). The template prompts the student to reflect on the material they have learned, to note what they enjoyed learning, and to identify any questions they still have.

KWHL chart, for which there is a photocopiable template (page 000), which teachers can give to students as they think appropriate. These are designed to be given to students at the beginning of a new topic, so they can identify what they already know (K) about the topic, what they would like to know (W) and how they will find out about it (H). The final section is to be completed at the end of the topic, so that students can reflect on what they have learned (L).

Mind maps, which students are asked to complete at the end of each chapter. A complete mind map is given in the Activity Book for chapter 1, and then chapters 2 to 5 have mind maps for the students to complete, with increasingly more boxes left empty. By chapter 6 (if the chapters are looked at linearly), students should be comfortable enough to draw their own mind map. Mind maps can be done on paper, or by using one of the free internet tools available (search for "free mind map tool"). Some students may not find mind maps a useful way of consolidating their thoughts, in which case they should be given leeway to produce a different kind of graphic, such as a fishbone chart (photocopiable, page 000; there are also fishbone templates in the students' graphic organiser).

Junior Cycle Profile of Achievement (JCPA)

The profile of achievement will incorporate:

- Two classroom-based assessments (**CBAs**)
- An assessment task
- A final examination.

Classroom-based assessments (CBAs)

CBAs will provide an opportunity for students to:

- Research and organise information
- Analyse data in order to be able to make value judgements
- Collaborate with others and communicate their ideas clearly
- Apply their learning to current significant events and contexts
- Be empowered to explore areas of personal interest
- Reflect on their contributions to the CBA.

These will be assessed at a common level by the class teacher and will be reported on using the following descriptors or yardsticks:

- Exceptional
- Above expectations
- In line with expectations
- Yet to meet expectations.

CBA 1 will take place over a three-week period in Term 2 of second year. It will involve an investigation of *Geography in the News*. This is an enquiry or investigation into a geographical event, based on a recent media source.

CBA 2 will take place over a three-week period in Term 1 of third year. An investigation of an aspect or aspects of *The Geography of a Local Area*. This an enquiry or investigation into a recent geographical event, based on a media source.

Assessment task

This is a written report, undertaken over two lesson periods following CBA 2 in Term 3 of their third year of study. It will be externally marked and will be worth up to 10% of the marks available for the state-certified examination. It assesses students in aspects that include their ability to:

- Reflect on how their geographical thinking has evolved
- Reflect on the skills that they have developed and applied
- Evaluate new knowledge, based on their experience of the CBA
- Reflect on how their appreciation of geography has been influenced by the CBA.

Final examination

This is a single-paper examination that will be set at a common level. It will take place in June of third year and will last no longer than 2 hours. It is worth 90% of the marks available for the state-certified examination. It will be will be assessed externally by the State Examinations Commission using the following set of grades:

- Distinction
- Higher Merit
- Merit
- Achieved
- Partially achieved.

Technology for studying geography

There are many research activities throughout the textbook for which the students will mainly do their research on the internet. For most classes it would be advantageous to have computer time available during the lesson, but look ahead at the chapter and it may be possible to set some of the tasks as homework.

There are other activities that require the student to create a presentation or poster, video or podcast, and again they will need computer access to do these.

There are few website addresses in the textbook, as these change quickly, or may have unsuitable material added. Therefore, those addresses we do give, tend to be for government agencies, where the website is likely to be in place for the duration of the students' learning. We do, however, give a number of website addresses in this Teacher's Resource Book at the end of each chapter.

In addition, you will find these sites helpful:

- **https://www.jct.ie/home/home.php**
- **https://www.examinations.ie/**
- **https://www.ncca.ie/en/junior-cycle**

Geography Now! Digital Overview

Resource	Suggested integration in class
Student website	■ Revise the key themes and topics of each chapter with a range of interactive activities (such as multiple choice quizzes, labelling, image match, and fill in the blanks activities). ■ Students can complete these activities in class or as a homework task. ■ These activities can be assigned during class time to early finishers. ■ The activities can be used to differentiate students according to ability; for example, while teachers are revising something with weaker students, the activities can be assigned to stronger students, or while teachers are working on a challenging activity with very strong students, the activities could be carried out by weaker students. ■ Activities can be used as part of a group or pair work task, and a competitive element can be introduced by asking two students to see how many activities they can complete in a set amount of time.
PowerPoint	■ Introduces each chapter and summarises key terms and illustrations to aid lessons.
Animation	■ Animations bring key diagrams from the textbook to life and reinforce the topic at hand.
Video	■ Videos allow students to observe geography in action.

Section 1

1 Our restless Earth

Overview

This chapter begins with a brief description of the place of Earth within the Solar System. It then examines the structure of Earth, giving a brief description of the layers that make up Earth. The remainder of the chapter deals with the crust of Earth: how it consists of plates and that these plates move. This concept introduces plate tectonics.

Students examine how and why plates move and identify the different types of plate boundary and what happens at each. This provides the introduction to the next three chapters: fold mountains, volcanoes and earthquakes. Finally, the chapter looks back at how Earth's crust has changed over the last 200 million years. This resource book has an additional activity to predict changes to the crust into the future.

Learning Outcomes addressed

1.1 Describe the formation and global distribution of volcanoes, earthquakes, and fold mountains in the context of **plate tectonics** and **structure of the Earth**.

Students are also working towards:

1.10 Investigate a range of physical processes active in a chosen location and the connections between them.

Statements of learning contributed to: 9, 16, 18

Learning intentions

When the students have completed this chapter, they will be able to:

- State Earth's position in the Solar System
- Describe the structure of Earth
- Examine the plates that make up Earth's crust
- Identify the seven main tectonic plates on a world map
- Describe the results of plates moving (fold mountains, volcanoes, earthquakes)
- Explain the concept of continental drift.

Key terms

crust mantle core magma plates plate tectonics convection currents transform boundary destructive boundary constructive boundary continental drift Pangaea

Before you start

Ask the students to complete the left-hand side of the anticipation exercise in their Activity Book.

Overview of textbook questions

1.1 Activity (pair work) **MIT**, **BN**, BL, BC, C, WwO, **MM**, SW

The answers should be written in the student's Activity Book. Answers: (a) 150 million kilometres (150,000,000 km), (b) Equator, (c) 40,070 kilometres, (d) 6,378 kilometres. Check also that the student knew how and where to find the answers and that they chose a reputable source. Assess how they worked with a partner: shared research, respect for each other, allowing each other to answer.

1.2 Activity **MIT**, BN, BL, BC, C, WwO, MM, SW

(a) Eurasian, (b) Pulling away from, (c) Antarctic

1.3 Activity SOL 16 **MIT**, BN, **BL**, **BC**, **C**, **WwO**, MM, SW

A: Constructive; B: Transform; C: Destructive

1.4 Activity (group work) **MIT**, BN, BL, BC, **C**, **WwO**, MM, SW

Assess student for correct and concise explanation and appropriate demonstration. Check example is correct.

1.5 Activity (group work) **MIT**, BN, BL, BC, **C**, **WwO**, MM, SW

Ireland not located at edge of plate / No large plate faults near Ireland / Most volcanic and earthquake activity takes place at plate boundaries.

1.6 Activity SOL 16 **MIT**, BN, BL, BC, C, WwO, MM, SW

(a) North American, (b) African and Indian plates, (c) North American and Pacific plates

1.7 Activity (TPS) **MIT**, BN, **BL**, BC, **C**, **WwO**, MM, SW

(a) Check against the world map on page 000. (b) Mediterranean Sea will close / disappear / get smaller.

(See video (0m 59s): **https://www.youtube.com/watch?v=2lt3ETk2MGA**.)

Key terms MIT, BN, **BL**, BC, **C**, WwO, **MM**, SW

Make sure the student can use the key terms appropriately. Encourage them to make up their own sentences that show real understanding.

Overview of activity book questions

Exercise	Answers/suggestions for answers
Matching exercise	1 D, 2 G, 3 A, 4 F, 5 C, 6 E, 7 H, 8 B
Key terms crossword	Across: 2 continental, 5 destructive, 7 Pangaea, 8 currents, 10 crust, 11 magma, 12 convection. Down: 1 mantle, 2 constructive, 3 tectonics, 4 plates, 5 drift, 6 transform, 9 plate, 10 core.
Key questions	**1** About 4.5 billion years ago
	2 Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune
	3 Core
	4 It is under a lot of pressure.
	5 Eurasian
	6 Constructive
	7 Destructive
	8 E.g. San Andreas Fault (where the Pacific Plate is sliding past the North American Plate).
	9 Convection currents

Key activity – Plate tectonics

Boundary label	A	B	C
Name the two plates that meet there	(i) North American (ii) Pacific	(i) Eurasian (ii) North American	(i) Eurasian (ii) Indian
Identify the type of boundary	Transform	Constructive	Destructive
Describe how the plates move	Slide past each other	Separate / move apart	Collide
List two features that you find at this plate boundary	(i) Fault lines (ii) Earthquakes	Two from: mid-ocean ridges, volcanic islands, volcanic mountains (volcanoes)	Two from: fold mountains, volcanic mountains (cones), earthquakes

Anticipation exercise	Make sure the student revisits the anticipation exercise and has ticked all items in the 'I know this' column on the right of the table. If they have ticked in the 'I need to learn this' column, make sure this is reflected in their self-assessment.
Mind map	Students will copy the mind map from the activity book. Check for accuracy and creativity, and that they appear to understand the connection between the bubbles. Allow students to draw a different type of summary chart (e.g. a fishbone chart) if they wish.
Self-assessment	The students should complete this themselves. Make sure they have an opportunity to ask questions and have a plan for filling in any gaps in their learning.
End of chapter reflection	Give students the end of chapter reflection photocopiable from page 000. Review this with each student together with their self-assessment.

Suggestion for additional activity

Watch the short video on plate movement in the future:
https://www.youtube.com/watch?v=2It3ETk2MGA

Using just five statements, predict what is likely to happen to Earth's crust over the next 250 million years.

Suggested resources

Videos

Structure of Earth (2m 07s): **https://www.youtube.com/watch?v=bgnn096PfWQ**

Structure of Earth – greater detail (2m 25s): **https://www.youtube.com/watch?v=_iUfi8XqEos**

Plate tectonics (2m 36s): **https://www.youtube.com/watch?v=OinfMLdornU**

Plate Tectonics – convection currents (1m 13s): **https://www.youtube.com/watch?v=ryrXAGY1dmE**

Plate tectonics for kids (5m 09s): **https://www.youtube.com/watch?v=tcPghqnnTVk**

Websites

Infosheet/diagram (downloadable) on the structure of Earth:
http://www.3dgeography.co.uk/volcano-worksheets

Labelled globe and infosheet – Structure of Earth: **http://www.bbc.co.uk/schools/gcsebitesize/geography/natural_hazards/tectonic_plates_rev1.shtml**

Plate tectonics – downloadable posters worksheets etc.:
http://www.wasp.edu.au/course/view.php?id=14

Introduction to plate tectonics: **https://geology.com/nsta/**

Digital references

RESOURCE	TITLE	*Geography Now!* TEXTBOOK REFERENCE
Student website	Chapter 1	2, 7
Animation	Figure 1.2 The layers that make up Earth	4
Animation	Figure 1.3 The main tectonic plates	4
Animation	Figure 1.4 Convection currents in the mantle cause the plates of the crust to move	6
Animation	Figure 1.5 The continents as they might have looked about 200 million years ago, before continental drift; during the early stages of continental drift; and a present-day map of the continents	7
PowerPoint	Chapter 1	7

12 Activity at plate boundaries – fold mountains

Overview

This chapter is the first chapter that takes a look at activities that occur at plate boundaries. Students will learn what fold mountains are and how they were formed in the context of plate tectonics. They will examine the two most recent periods of fold mountain building: Armorican and Alpine. In both cases, links to the Irish landscape are explored. A key investigation in the Activity Book will ask students to research the third period of folding (Caledonian).

Students will examine how humans interact with fold mountains. They are introduced to the concept of sustainability. The chapter finishes with a group activity comparing the lives of young people in the Himalayas with those of young people in Ireland.

Learning Outcomes addressed

1.1 Describe the formation and global distribution of volcanoes, earthquakes and **fold mountains** in the context of plate tectonics and structure of the Earth.

2.1 Describe the economic and social impacts of how we interact with the occurrence of volcanoes, earthquakes and **fold mountains**.

Students are also working towards:

2.3 Identify how the physical landscape influences the development of primary activities.

Statements of learning contributed to: 6, 7, 8, 9, 10, 16, 18

Learning intentions

When the students have completed this chapter, they will be able to:

- Describe how fold mountains are made
- State periods of folding and give examples of the mountains that resulted
- Explain how people interact with fold mountains with reference to the Himalayas
- Consider how modern practices and technologies affect the traditional ways of mountain living.

Key terms

fold mountains anticline syncline Alpine folding Armorican folding

Before you start

Ask the students to complete the left-hand side of the anticipation exercise in their Activity Book.

Classroom demonstration

Fold mountain formation

This demonstration simulates the formation of fold mountains.

When to do it After reading the chapter introduction (page 9).

Equipment

- Rectangular-shaped food container (clear plastic)
- Sand
- Folded (layered) tissue paper
- A piece of cardboard

Steps:

1. Cut the cardboard so that it fits tightly against the inside of the plastic container.
2. Place a thin layer of sand on the bottom of the container.
3. Cover this with a layer of tissue paper.
4. Repeat the process until you have 5 (or 7, depending on the height of the container) layers in place (see figure 2.1). NB Ensure that the container is not more than half full at this stage.
5. Hold the cardboard firmly and slowly press it forward against the sand. The layers will begin to fold. (See figure 2.2.)

You can stop at any point to take questions or offer explanation.

Figure 2.1 Before

Figure 2.2 After

Overview of textbook questions

2.1 Research

MIT, BN, BL, BC, C, WwO, MM, **SW**

Check against the world map on page 000.

2.2 Experiment

MIT, BN, **BL**, **BC**, C, WwO, MM, SW

(a)–(c) Assess for clarity, language use, observation and accurate recording by text and drawing. Make sure the diagram is labelled with 'Anticline' and 'Syncline'.

(d) No change because the conditions did not vary / Change due to variations in the speed and the pressure of the 'plate' movements

(e) (Pair work) See (d) above.

2.3 TPS

MIT, BN, BL, BC, **C**, WwO, MM, SW

Seas covered areas where fossils were laid down / Fossils laid down in shallow seas / Uplift followed / Folding took place / Sediments now at higher level.

2.4 TPS

MIT, BN, BL, BC, C, WwO, MM, SW

Strata (layers) are no longer horizontal / Anticlines and synclines can be seen / Faults (cracks) in rocks are evidence of pressure put on the rock.

2.5 Activity

MIT, BN, BL, BC, C, WwO, MM, SW

(a) Collision of Eurasian Plate and African Plate. (b) North-South / African Plate pushed northwards against Eurasian Plate.

2.6 Research

MIT, BN, BL, BC, C, WwO, MM, SW

A: MacGillicuddy's Reeks, B: Comeragh Mountains, C: Galtee Mountains, D: Caha Mountains, E: Knockmealdown Mountains

2.7 In the news (group work)

MIT, BN, **BL**, BC, **C**, **WwO**, MM, SW

(a) (i) Agriculture (animal farming), trade, tourism, (ii) Old: traditional / sustainable / barter / all linked to farming / self-sufficiency; New: unsustainable / money / growth of tourism / loss of self-sufficiency / impact on environment / unsustainable, (iii) Climate: short growing season / shortage of water /cold is uncomfortable for work); viability: small farms / difficulty of getting produce to market, (iv) Loss of fallow period (10 years to 2–3 years) / overfarming / attraction of employment and opportunity elsewhere, (v) Barter vs money / Personal sale vs markets / local vs distant, (vi) Change from agriculture to tourism / urban migration / more employment options – construction, tourism, etc., (vii) Destruction of natural resources / loss of trees / destruction of ecosystems / loss of traditional medicines, (viii) Positive: increase in employment opportunities / increase in wealth or earnings / increase in standard of living / less dependence on agriculture; Negative: construction of infrastructure has led to loss of forest and plant life / this may, in turn, lead to migration from the area.

(b) The students will probably give greater detail, but they should include: Challenges – employment, education, migration. Compare to Irish – Greater opportunities in all areas.

Key terms

MIT, BN, **BL**, BC, **C**, WwO, **MM**, SW

Make sure the student can use the key terms appropriately. Encourage them to make up their own sentences that show real understanding.

Overview of activity book questions

Exercise	Answers/suggestions for answers
Matching exercise	1 E, 2 D, 3 A, 4 G, 5 B, 6 C, 7 F
Key questions	**1** (i) Himalayas, (ii) Alps, (iii) Andes, (iv) The Rocky Mountains
	2 Armorican mountains are older than Alpine mountains and are therefore more time for them to be worn down. Plus point: Armorican mountains are about 250 million years old; Alpine mountains are 30–35 million years old.
	3 Armorican
	4 Eurasian and African
	5 Two from: MacGillycuddy's Reeks, the Cahas, the Galtees, the Comeraghs, the Knockmealdowns. (Students may name another range from Munster.)
Key investigation	(a) Caledonian. (b) 400 million years ago. (c) e.g. Donegal mountains (student may name another). (d) They have been worn down over hundreds of millions of years.
Key activity	Student's own work. All answers are valid; students should be able to give a reason why if you ask them.
Anticipation exercise	Make sure the student revisits the anticipation exercise and has ticked all items in the 'I know this' column on the right of the table. If they have ticked in the 'I need to learn this' column, make sure this is reflected in their self-assessment.
Mind map	Student's own work. Check for accuracy and creativity, and that they appear to understand the connection between the bubbles. Allow student to draw a different type of summary chart (e.g. a fishbone chart) if they wish.
Self-assessment	The students should complete this themselves. Make sure they have an opportunity to ask questions and have a plan for filling in any gaps in their learning.
End of chapter reflection	Give students the end of chapter reflection photocopiable from page 000. Review this with each student together with their self-assessment.

Suggested resources

Videos

Folding (0m 21s): **https://www.youtube.com/watch?v=6OHRb_ODo-Q**

Formation of Himalayas (1m 14s): **https://www.youtube.com/watch?v=PDrMH7RwupQ**

Websites

Fold Mountains (diagrams and photographs): **http://www.3dgeography.co.uk/mountain-diagrams**

How fold mountains are formed (diagrams):
https://www.dkfindout.com/us/earth/mountains/fold-mountains/

Fold mountains (GCSE): **https://www.bbc.co.uk/education/guides/zyfxdmn/revision**

Digital references

RESOURCE	TITLE	*Geography Now!* TEXTBOOK REFERENCE
Student website	Chapter 2	8, 13
Animation	Figure 2.1 Fold mountains	9
Animation	Figure 2.2 The Andes were formed when two plates collided	10
Video	Figure 2.3 Folding has buckled the rocks to form anticlines and synclines. Note the faults that run up through the rock	10
PowerPoint	Chapter 2	13

Notes

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Geography Now!

Teacher's Resource Book

The *Geography Now!* Teacher's Resource Book will assist in engaging with the new Junior Cycle course, focusing on geo-literacy, interconnections and sustainability. It includes:

- An introduction to key educational changes in the **new Junior Cycle for Geography**, including **Statements of Learning** and **Key Skills**, with an emphasis on **literacy** and **numeracy**
- **Suggested solutions** to activity book and textbook questions
- **Peer-assessment photocopiables** – one for each strand
- Additional student activity suggestions for every chapter
- Guidelines on a **non-linear approach** to the textbook
- Outline of relevant **digital resources** for each section

FREE TEACHER'S POSTERS

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