GEOSCIENCE FOR LEAVING CERTIFICATE GEOGRAPHY

Continuing Professional Development Course 2022

DRUMLINS LESSON PLAN

Geraldine O'Brien (Carrigallen Vocational School), Tiernan Henry (UoG, iCRAG)

iCRAG
SFI RESEARCH CENTRE IN APPLIED GEOSCIENCES

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

An Roinn Comhshaoil, Aeráide agus Cumarsáide
Department of the Environment, Climate and Communications

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

An Roinn Comhshaoil, Aeráide agus Cumarsáide
Department of the Environment, Climate and Communications

Geoscience for Leaving Certificate Geography Teachers CPD programme

About the Geoscience for Leaving Certificate Geography Teachers CPD programme

Geoscience is vital for our sustainable future, and geography is the key gateway to geoscience for most students. The Geoscience for Leaving Certificate Geography Teachers CPD programme has been developed by iCRAG (the Science Foundation Ireland Centre for Research in Applied Geosciences) and Geological Survey Ireland to create an opportunity for teachers and geoscience professionals to come together to increase the awareness of geoscience within the Leaving Certificate geography curriculum.

During the CPD course, teachers and geoscience professionals from both research and industry are paired together to co-create curriculum facing resources that are freely available for use. Over the course of six evening sessions, teachers learn more about the cutting-edge geoscience being undertaken by their partnered geoscientists, before working together to develop a curriculum-facing resource using their interests, teaching expertise and the knowledge of the geoscientist. In 2021, the resources produced have included lesson plans, module plans and field guides and the accompanying teacher notes and slides/field booklets for each resource.

The resources link the most recent advances in geoscience to the geography curriculum in a way that is both understandable and relevant. The resources are freely available to be used for classes anywhere in the world. We hope that you and your students enjoy using them.

This resource

This resource has been developed by Geraldine O'Brien, a geography teacher at Carrigallen Vocational School and iCRAG researcher Tiernan Henry. The resource is a deep dive into Irish drumlins. Included in this resource pack is a full lesson plan and associated teacher notes, and a PowerPoint of slides. It is suitable for Leaving Certificate Students.

Sincerely,

Elspeth Sinclair

Elspeth Sinclair, Fergus McAuliffe, Siobhán Power
Programme Managers – Geoscience for Leaving Certificate Geography Teachers

Geological Survey Ireland, a division of the Department of Environment, Climate and Communications, has been mapping Ireland since 1845. They continue to map the Irish land and marine territories, as well as mineral and groundwater resources. They have responsibility for actions in the current Climate Action Plan including monitoring coastal change, the Just Transition in the midland counties, and providing data for de-risking offshore renewable energy. Irish geoscience research, particularly as it contributes to the development of government policy, is an important part of their work and they fund and co-fund many research projects, including some of the iCRAG research work. Their data and maps are freely available to all at www.gsi.ie.

iCRAG, the Science Foundation Ireland (SFI) Research Centre in Applied Geosciences, are a team of researchers creating solutions for a sustainable society. They develop innovative science and technologies to better understand Earth's past, present, and future and how people are connected to it. iCRAG drives research into areas that are critical to society, including:

- The minerals and metals we need for decarbonisation and sustainable energy.
- Securing and protecting groundwater and marine resources.
- Protecting society from Earth's hazards, such as floods and landslides.

Further information is available at: www.icrag-centre.org

Disclaimer: Every effort has been made to ensure that the information in this book is accurate. Data, links, and maps are accurate as of January 2023. The publishers cannot accept responsibility for any consequences arising from the use of this resource. The publishers are in no way liable or responsible for any injury or loss to any person using this resource.

Lesson plan: Drumlins and their effects on the Irish Landscape

Contents

Lesson plan: Drumlins and their effects on the Irish Landscape

Links to curriculum

Core Unit 1: Patterns and Processes in the Physical Environment
1.5 Landform Development-glacial landforms-drumlins
1.5 Landform Development – Drainage patterns
Core Unit 2: Regional Geography
2.1 The Dynamics of Regions – How economic, human and physical processes interact in a particular area.
Elective 5
5.4 Settlements can be identified in relation to site, situation & function

Learning Outcomes

Students should be able to:

- Navigate Scoilnet maps website
- Navigate the Geological Survey of Ireland website
- Identify and locate glacial landforms for example drumlins on diagrams, OS maps and photographs
- Describe the formation of drumlins
- Locate place names suggesting drumlins
- Explain how the physical landscape(drumlins) influence road transport.
- Identify, describe and explain drainage patterns on OS maps
- Understand the type of farming practiced in drumlin regions.

Resources required:

- Whiteboard
- Computer/laptop
- Playdough
- Geological Map of Ireland

Keywords and definitions

Keyword	Definition
Drumlins	An oval-shaped hill consisting of boulder clay.
Stoss slope	The steep slope of a drumlin which faces the direction of the ice movement.
Lee slope	The gentle slope of a drumlin.
Unstratified	Unsorted material which may vary from large boulders to fine rock particles.
Boulder clay	A mixture of boulders & clay deposited directly by a glacier
Eustatic movement	Is the rising or falling of sea level relative to the land
Deranged drainage	Deranged drainage pattern occurs where glaciation has affected the landscape. Rivers have no definite pattern, they are irregular in appearance.
Pastoral farming	Pastoral farming occurs when there is grazing of animals. Examples of this include dairy farming, beef farming and sheep rearing.
Dendritic	Drainage pattern looks like a tree.
Radial	Drainage pattern looks like the spokes of a wheel
Trellised	Drainage pattern occurs when tributaries join the main river at right angles.

Learning Activities

Students will:

- Complete the retrieval exercise on previous knowledge.
- Navigate Scoilnet maps and Geological Survey of Ireland websites
- Learn about drumlins through a PowerPoint presentation.
- Participate in a group activity to construct models of drumlins.
- Engage in talk and discussion on the models of drumlins.
- Present their models to the class.
- Watch video clips
- Evaluate their work by completing 3-2-1 Exit ticket.
- Possible field trip

Extra Info/Files

	Web Address	Brief Description
1.	https://maps.scoilnet.ie/	Videos showing how to use Scoilnet maps eg swipe and spotlight widget
2.	www.gsi.ie	
3.	https://timeforgeography.co.uk/videos_list/glaciation/formation-drumlins/	The formation of drumlins

Resources Provided

- Teacher Lesson Plan
- PowerPoint to guide lesson
- 3-2-1 Exit ticket

Materials Needed

- Laptop/iPad
- Play dough
- GSI Map - Bedrock Geology of Ireland
- OS map & aerial photograph of Carrick-on-Shannon

Methodologies

- Retrieval practice
- Talk and discussion Q&A
- Active learning
- Investigative approach
- Group Work
- Keywords accompanied by a set of Notes
- Oral questioning

Assessment

- Teacher observation and discussion on the construction of drumlins.
- Teacher questioning – talk and discussion
- Review keywords at the end by writing out what they have learned on a new page.
- Self-assessment – Exit ticket

Linkage and Integration

Linkages

Art- model construction
Numeracy – calculating averages, providing grid references for their school in their local area, drumlins etc
Literacy – keywords displayed on the whiteboard.
S.P.H.E. – working together co-operatively
English- oral language through talk, discussion, and presenting their work
History – local history

Differentiation

- Teaching style
- Support
- Task

Teacher Notes

This lesson plan is aimed at 5th Year students. It is planned for a double class or over two single classes.

Use the PowerPoint to guide through the lesson.

1. Start the lesson with retrieval practice.
2. Share Lesson Intentions and keywords with the students.
3. Go to the GSI website and click on the map of Ireland. Select GEOLOGY (second tab). Go to the Layer tool (on the top right of the screen, looks like a few pages on top of each other) and turn off the geology (uncheck the box). Then zoom into your chosen area and turn on GEOMORPHOLOGY in the Geology layer list. All the moraines and drumlins will appear on the map. Ask students to study their local area in this map.
4. Go to Scoilnet maps website at www.maps.scoilnet.ie and click on OSi map viewer. Activate search for a location tool by inserting Eircode of your school. Ask students to look at heights of drumlins in their area.
5. PowerPoint slides on the formation of drumlins, recognising drumlins in diagrams, photographs and OS maps.
6. Draw labelled diagram of a drumlin on whiteboard and ask students to take it down.
7. Look at OS maps to recognise the direction of ice movement, the stoss and gentle side of drumlins.
8. Class activity: make models of drumlins.
9. Look at OS maps and select names that suggest the presence of drumlins/hills
10. Look at OS maps and prompt discussion how drumlins influence roads.
11. PowerPoint slides on drainage patterns
12. Prompt discussion on how drumlins influence agriculture
13. Look at past LC questions on drumlins e.g. Carrick-on-Shannon
14. Exit ticket