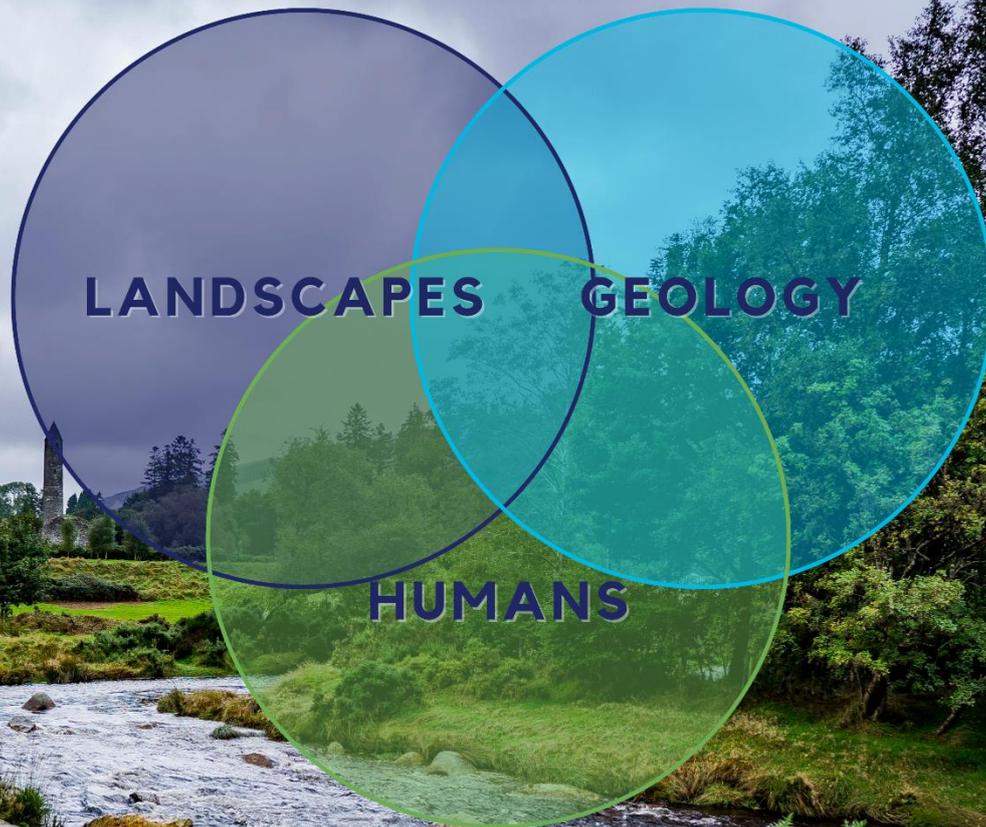


# GLENDALOUGH FIELD COURSE FIELD WORKBOOK



Name:

Date:

Created during the Geoscience for Leaving Certificate  
Geography Continuing Professional Development Course 2021

**iCRAG**

SFI RESEARCH CENTRE  
IN APPLIED GEOSCIENCES



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Department of the Environment, Climate and Communications

# Glendalough Field Study

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## **Materials:**

Please ensure that you have the following items before you leave!

- Warm clothing (jacket, gloves, hat)
- Water-proof jacket
- Hiking shoes/boots – important especially in wet weather where rocks and the trail are very slippery
- Food and water
- Drawing Materials (pencil, eraser)
- This Workbook (provided)
- Compass (provided)
- Hardhat (provided)
- Reflective Vest (provided)

## **Safety Information / Hazards:**

The Glendalough in the Wicklow Mountains while beautiful it is important to be aware of a few hazards. The primary hazards are due to the rough terrain and potentially poor and fast changing weather.

Even on relatively warm days Glendalough can be quite windy and can make the weather around 10°C cooler than the forecasted temperature. To prevent any risk of hypothermia make sure you have warm clothing and a waterproof jacket and shoes.

Many areas of the trails can be quite slippery, especially when wet, therefore proper hiking boots are needed to prevent ankle and leg injuries.

Glendalough is a busy area so when working close to the road wear a reflective vest to stay visible. Also be aware of the surroundings and ensure that you do not get in the way of other users of the Glendalough area.

## **Emergencies and Injury:**

If you are injured or feel unwell, please alert the nearest teacher or if you are unable to do so safely or comfortably get your other group members to get assistance.

## **Toilets**

As a group, you are advised to use the public toilets in the Upper Lake car park

## **Shops/Food**

It is advised to bring a packed lunch as there is no guarantee that stalls will operate

Draw  
North  
Arrow



Mine Site



Historic Point



Observation Points



  
River Observation  
Point B (Part 2)

  
Sampling Site (Part 1)  
and Mine Area (Part 3)

  
River Observation  
Point A (Part 2)

  
Lake and Sediment  
Observation  
Point (Part 2)

## Weather and Conditions:

Before starting any fieldwork, it is necessary to write down the current conditions and outline any possible hazards that you may encounter.

**Date:**

**Time:**

**Temperature:**

**Cloud Cover (Sunny, partly cloudy, cloudy):**

**Air Pressure (high, low):**

- High Pressure is usually accompanied by clear skies
- Low Pressure is usually accompanied by rain and clouds

**Precipitation (none, light, heavy):**

**Wind (none, light, strong):**

- Strong wind = you can easily lose your paper, hat, etc.

**Potential Hazards (explain how you are prepared to minimize the hazards):**

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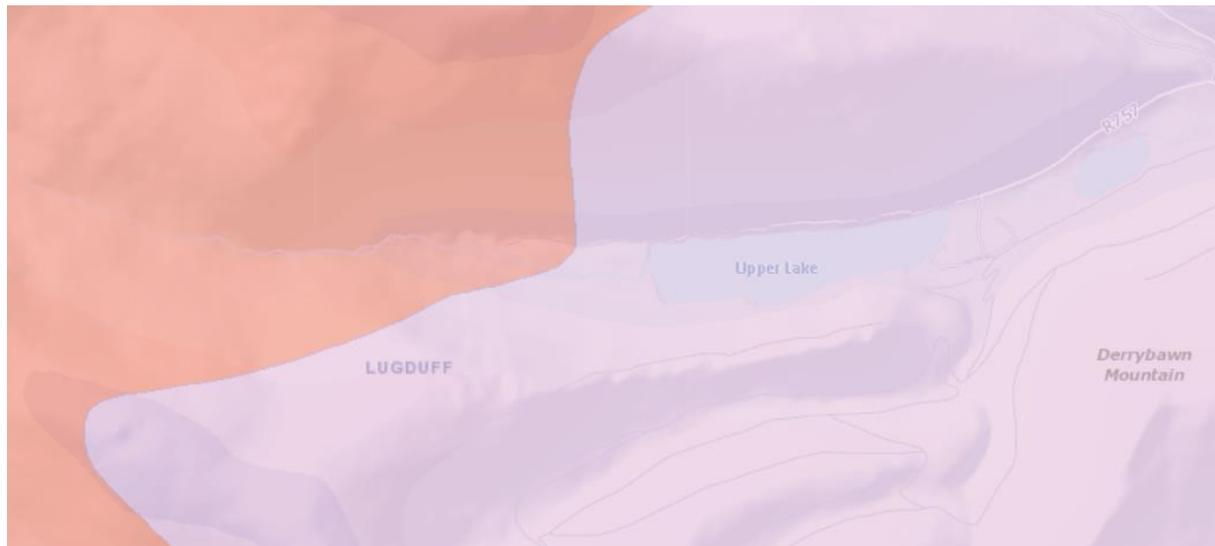
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## Part 1 – Geology

### **Background:**

The Glendalough area is an area that exposes a few different types of rocks that helps geologists' piece together the history of the area and Ireland. Based on Geological Survey Ireland's map of the geology, there should be two types of rocks in the area (highlighted as purple and red in the figure below). Your goal is to find an example of each rock type, describe and interpret them.

**HINT:** Finding the purple rock type can be tricky so look in places such as paths, rock walls, or on the beach of the upper lake. Many examples of the red rock can be found at the mine site.



To answer the following questions you may use the following information:

### **Rock Types:**

**Sedimentary Rocks:** Formed from sediment (e.g. sand, silt, clay, shells) that have been compacted into a rock. Some common sedimentary rock types include

- Limestone – usually a dull blocky rock that may have fossils
- Sandstone – made of sand size particles
- Mudstone/Shale – made of clay or silt sized particles (too small to see). Shales usually create flat sheets when broken.
- Conglomerate – Made a mix of fine-grained material (the matrix) and larger material from a different rock (the clasts).

**Igneous Rocks:** Formed from cooled magma or lava.

- If the igneous rock cooled underground slowly it is called **intrusive** which creates a rock with visible, often blocky crystals.
- If the magma erupts as lava, it is called **extrusive**. Extrusive rocks cool too fast to create visible crystals.

Igneous rocks can be classified by the types of minerals it is composed of:

Felsic Rock < 20 % dark minerals

Intermediate Rock = ~50 % dark minerals

Mafic Rock > 80% dark minerals

Using these descriptions we can give the rock a name:

Possible Rock Type	Intrusive	Extrusive
Felsic	<b>Granite</b>	<b>Rhyolite</b>
Intermediate	<b>Diorite</b>	<b>Andesite</b>
Mafic	<b>Gabbro</b>	<b>Basalt</b>

Metamorphic Rocks: These form when you apply temperature and pressure to igneous or sedimentary rocks. The main identifying feature of these rocks is that you see that minerals become aligned in a single direction (e.g. sheet minerals align in the same direction).

**Question 1:**

Describe both Rock Type 1 and 2 using the table below and **mark their location on the map** where you found them. Have someone in your group **take a picture of the rock you described.**

	Rock Type 1	Rock Type 2
<b>Colour(s)</b>		
<b>What are the sizes of crystals that you see?</b>		
<b>Are the crystals aligned in any direction?</b>		
<b>What are the shapes of the crystals? (Round, irregular, stubby, sheet-like)</b>		
<b>Rock Type (Igneous/Metamorphic/Sedimentary)</b>		

**Question 2:**

How did you determine if the rocks were Igneous, Metamorphic or Sedimentary using these observations?

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**Question 3:**

Near the mine site there are a lot of rocks (Rock Type 2) that have fallen. Find a good piece of rock that shows the crystals clearly. Lets try and identify the different minerals and name the rock.

Possible Mineral	Description	What is its modal percentage? (i.e. what % of the rock is it)
<b>Biotite</b>	Black, shiny, flat crystals	
<b>Muscovite</b>	Clear/white, shiny, flat crystals	
<b>Quartz</b>	Grey blocky crystals	
<b>Feldspar</b>	White blocky crystals	
<b>Other Mineral?</b>		

These types of minerals are typically found in igneous rocks. **What is the rock name and how did you determine it?**

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## Part 2 – Landscapes

You will be travelling up the lake to the top of the valley during Part 2 to observe and document the lake, river and valley. You will make observations of the river at different areas (see the Map), and you will choose one area to do a field sketch of the valley.

**STOP + THINK + OBSERVE:** At the beach of the Upper Lake of Glendalough and before you begin exploring the river's stages, look up the valley and consider the following questions:

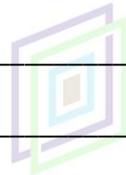
Using your compass **put a North Arrow** on the map:

Glendalough is a glaciated valley. What evidence do you have for this, explain?

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Which features might you see at the lower course of the river?

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Which features might you see at the upper course of the river?

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Which course will erosion be most active? Why?

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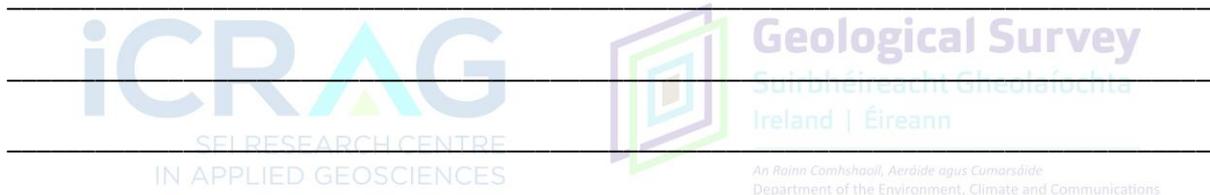
What part of the river will be slower? Why?

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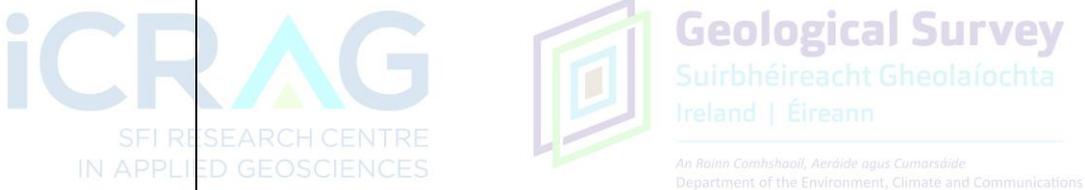
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Which course are you more likely to see bigger rocks? Why?

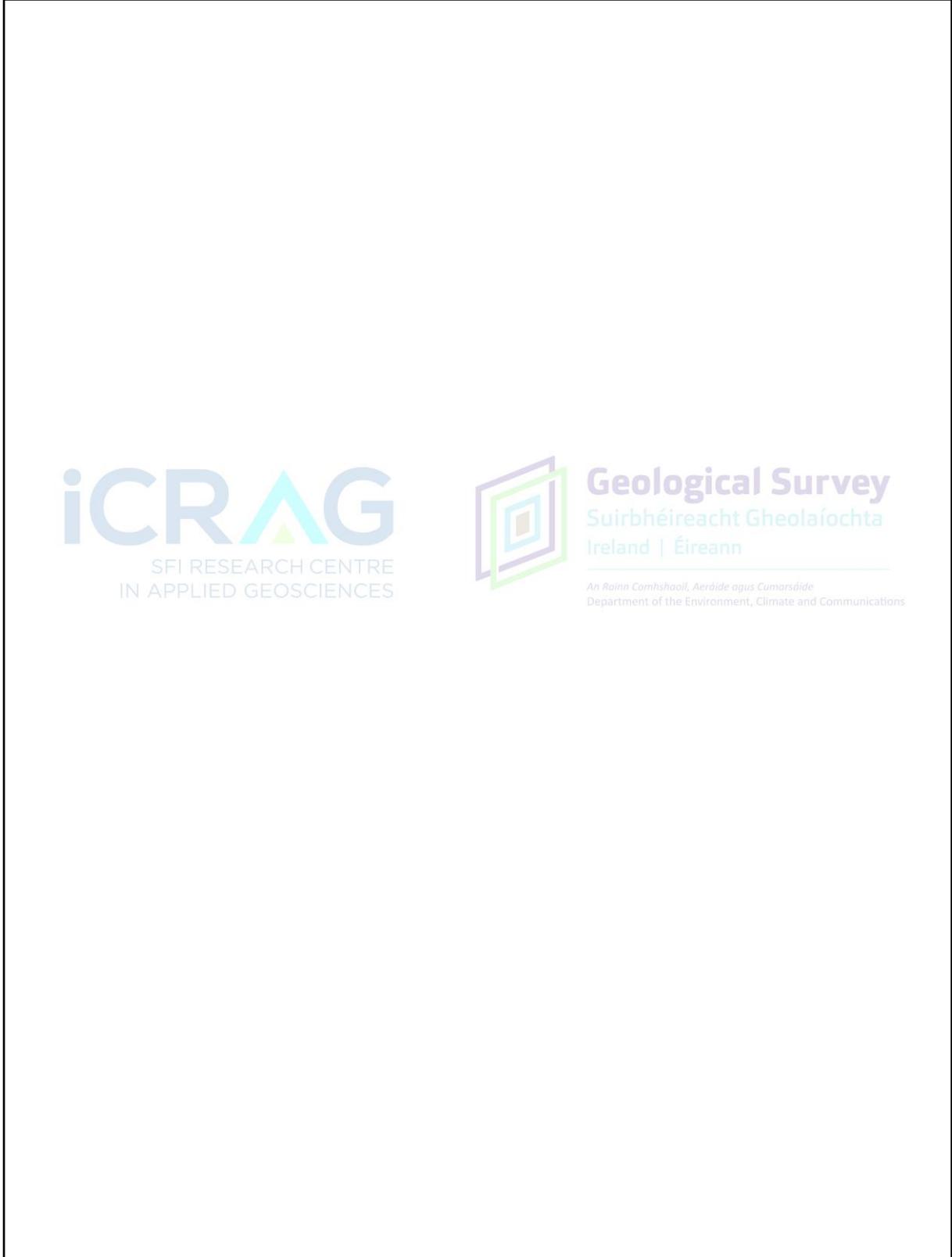


Using the table on the next page, record some observations that you see at the lake, the lower river stage, and the upper river stage. Think of the following;

- Is the water moving fast or slow? Why?
- What colour is the water? Why?
- Describe the shape of the river/lake
- What is the direction of flow and its relative velocity?
- Describe any erosion/weathering
- Describe and deposition

Location	Observations
<b>Lake</b>	
<b>Lower Course (Map Observation Point A)</b>	 <p>The middle row of the table contains two logos. On the left is the iCRAG logo, which consists of the letters 'iCRAG' in a light blue font, with a small green triangle under the 'A'. Below it, in a smaller font, is 'SFI RESEARCH CENTRE IN APPLIED GEOSCIENCES'. On the right is the Geological Survey of Ireland logo, which features a stylized square icon made of concentric lines in purple, green, and blue. To the right of the icon, the text reads 'Geological Survey' in a large blue font, followed by 'Suirbhéireacht Gheolaíochta' in a smaller blue font, and 'Ireland   Éireann' in a smaller blue font. Below this, in a very small font, is 'An Roinn Comhshaoil, Aeráide agus Cumarsáide' and 'Department of the Environment, Climate and Communications'.</p>
<b>Upper Course (Map Observation Point B)</b>	

Somewhere in the valley and draw a detailed **field-sketch**. **Label where you made the sketch on your map**. Using your compass, state **the bearing** (direction you are looking) at the top of the sketch.



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## RECAP

What is the main thing you found interesting/learned today?

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Have you any unanswered questions?

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## Part 3 – Human

Glendalough is one of the most important medieval ecclesiastical landscapes in Ireland. It is a fascinating 6<sup>th</sup> century monastic settlement, founded by St. Kevin. At this point of your field trip, you will now walk around ancient ruins and view the impressive 30-metre-high round tower.

Make notes on the following impressive ruins:

- 30-metre-high round tower

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- St. Kevin's Church

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- St. Kevin's Cross

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- The Monastic City Gateway

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- Priest House

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- The Caher

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- Outline one more impressive ruin and give details

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- What have you learned about St. Kevin?

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The next part of your field study will bring you to the **Miner's Village**. Mining in Glendalough dates back to the 1790's where lead, zinc and silver were mined. Mining in this area took place for over 150 years.

Discuss and answer the following:

What have you learned about mining in Glendalough? Make sure to make use of the vast amount of information provided around the Miner's Village

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Finally, in small groups, discuss the following questions

- What attracts tourists to Glendalough?

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- Outline both positive and negative effects of tourism in Glendalough

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