



Down To Earth – Exploring Ireland’s Geology exhibition

Geology extravaganza worksheet

In the Riding School: Down to Earth – Exploring Ireland’s Geology exhibition

1. Look at the big geological map on the floor (yes, you’re allowed to walk on it!)
- a) Can you find the bedrock where you live? What is it?
(Hint: The different colours represent different rocks. Look at the legend on the left-hand side of the map to see which rock the colour represents. Using the numbers also helps)

- b) Are there any other features where you live? e.g. faults (thick black lines), igneous intrusions (red lines = dykes, use legend for other igneous intrusions)

- c) Where are the oldest rocks in Ireland found? They are found on an island.
(Hint: The rocks at the bottom of the legend, but above the igneous intrusions, are the oldest)

- d) Where are the youngest rocks in Ireland found?
(Hint: The rocks at the top of the legend are the youngest)

- e) Everyone can be a geologist – one of the skills involves describing what you see. Look at the rock samples around the floor map. Can you describe the rocks and put them in the rock group they belong to? Have you learnt about any of these in school?
(Hint: The back wall will help you with this question)

Igneous

You can see crystals/ minerals rather than grains. These can either be coarse (big) or fine (small) in size

Metamorphic

You can see evidence of the high heat and/or pressure the rock has experienced e.g. banding of minerals, ‘fusion’ of minerals

Sedimentary

You can see individual grains e.g. sand, pebbles. Other features present include fossils and layers

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Floor map



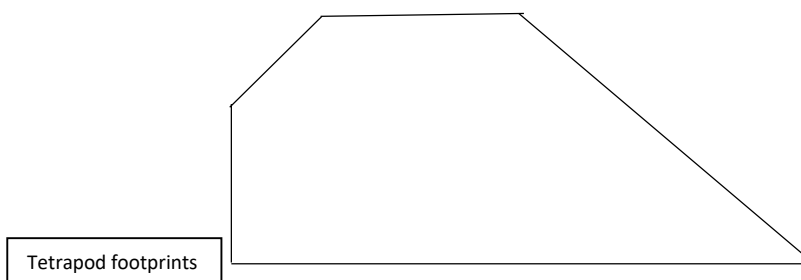
f) Fancy a challenge? Find the geologist and try this question

Ask the geologist to tell you how Ireland has moved through geological time so that you can match Ireland's position globally with when the following rocks formed.

Gneiss from Inishtrahull
Limestone from Tullamore
Old Red Sandstone
Giants Causeway basalt

Northern Hemisphere (~ 50° latitude)
Southern Hemisphere (~ -80° latitude)
Equator (0° latitude)
Southern Hemisphere (~ -30° latitude)

2. Look behind you at the 4-limbed animal and the big fossil to the left of it. Can you draw where you think the footprints are?



3. Circle the examples of tetrapods:

Horse	Snake	Human	Chicken	Dog
Spider	Lion	Newt	Salmon	Chimpanzee

4. Why are the tetrapod footprints so important in our evolutionary history?

5. Move along until you see the maps in the cabinets.
When was the earliest geological map of Ireland produced?

1875	1838	1824	1893	1868
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6. When was the first digital geological map published?

1972	1982	1992	2002	2012
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7. From what you've seen in the cabinets and on the walls, which techniques/ technologies do you think were used to map Ireland in the past?

Tetrapod

Survey history

8. Name the equipment that Geological Survey Ireland use to map Ireland today. Keep an eye out for some of these as you go around the exhibition and don't forget to look up!

Words to use: compass-clino, drone, Tellus plane, magnetic susceptibility instrument, drill rig, auger, RV Keary, satellite



9. Continue onwards and to the right until you see the RV Keary.
 How do the survey boats map the sea floor? Can you draw how it works?
(Hint: Look out to sea and look at the screens on the bridge of the boat)

10. Thanks to mapping the sea floor, producing the 3D map you see behind you, we know the full size of Ireland's claimed territory. How many times bigger is the marine territory compared to the land?

5x

10x

15x

20x

11. Go back the way you came and look at the Groundwater pump model.
 Press the different pedals to see how the water table moves. Can you draw how the water table moves from the position below when it rains and when it is being drawn up by the well?



Water table = the underground boundary between the saturated zone (i.e. groundwater within rock) and the unsaturated zone (i.e. no groundwater within rock)

12. Move on to the minerals section and start with the old mine image.
 Navan Mines/ Boliden Tara Mines is the biggest producer of which mineral in Europe?

13. Looking at the long cabinet, match the mineral to its usage. 2 are found in other cabinets in this section.

Lithium	Fireworks
Carbon	Ceramics
Sulphur	Non-stick coatings
Silica	Smartphones
Gold	Batteries (ion)
Clay	Glass
Copper	Pencils
Fluorite	Pipes

14. Draw or name 5 of the different forms of quartz. Which form is your favourite and why?



15. Look at the back wall, and all of the different materials needed to make a mobile phone.
Which 3 surprised you the most? Why?

16. Go to the cross-section of the kitchen. Match the materials needed for the following:
(Hint: Don't forget to check the kitchen wall!)

Toothpaste	Plastics from oil
Scouring pad	Lithium, zinc
Soft drink	Zeolites
Washing powder	Fluorite, apatite
Microwave meals	Iron, tin
Chopped tomatoes	Oil, steel, quartz glass
Batteries	Iron
Driving	Aluminium

17. Move towards the entrance and stop at the tables on your left.
a) What are the long, cylindrical pieces of rock you can see on the table called?

- b) What are they used for? Make sure to check out the 'fabric of a city' illustration.

Decoration	Understanding subsurface (below ground) rocks	Structural support	Understanding surface (above ground) rocks
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18. Look behind you at the Tellus section.
How does the Tellus programme map Ireland? Don't forget to check the locker!

19. The Tellus plane has flown the equivalent of _____ times around the world.

5 10 15 20

20. Name some of the geological places that tourists visit in Ireland. You may have visited some of these places on your holidays too!
(Hint: The wall opposite the Tellus section may help you with this question)

Drilling

Tellus

Geoheritage

21. Geotourism is...

✓ or ✗

- ... tourism associated with geometry
- ... tourism associated with geothermal energy
- ... tourism associated with farming
- ... tourism associated with geology
- ... tourism associated with space

22. Go to the seismometer. Yes, it's that thing in the glass box made from Lego!
 Make an earthquake (jump!) and draw how the line moves.

Geohazards

23. Look behind you at the TV screen. Can you draw on the map below where the seismometers to detect earthquakes are located around Ireland?



Image: <http://www.clipart.com/cliparts/W/9/Z/p/N/3/outline-map-of-ireland-hi.png>

24. Carry on along the wall. When was the last time a tsunami reached Ireland's shores?
 (Hint: Don't forget to read the yellow box!)

1661

1761

1861

1961

25. Data from which Geological Survey Ireland programme is being used to produce a radon map of Ireland?



26. Make your way to the model in the glass cabinet.

What is the name given to the temporary lakes that are influenced by groundwater?

27. Which geohazards are most likely to affect Ireland?

(Hint: There may be more than one)

Volcanoes

Earthquakes

Landslides

Sinkholes

28. Looking at the last wall, circle the ways Geological Survey Ireland is contributing to the Earth and its future?

Mapping coastal change

Mapping the moon

Mapping the seabed

Looking at alternative
farming jobs

Looking at alternative
geoscience jobs

Looking at alternative
energy sources

Contributing to the Just
Transition

Data being freely available
data to all

Contributing to policy

29. List 3 things which interested or surprised you the most about this exhibition.

Suggested answers can be found on our website, [here](#). Please click the link to be redirected to the relevant page on Geological Survey Ireland's website.