ANSWERS

Geological Survey Suirbhéireacht Gheolaíochta Ireland | Éireann

museum National Museum of Ireland Ard-Mhúsaem na hÉireann

Down To Earth – Exploring Ireland's Geology exhibition and Decorative Arts & History 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 <u>above</u> the igneous intrusions, are the oldest)

   Inishtrahull / County Donegal (on legend: number 12)

   _____

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

   Northern Ireland (on legend: number 83)

   _____

Floor map

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

Giants Causeway basalt

Pillow lava/ pillow basalt

Granite

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

Schist

Gneiss

Quartzite

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

Limestone (sample on LHS of map)

Limestone (sample on RHS of map)

Chalk

Sandstone (sample on LHS of map)

Sandstone (sample on RHS of map)

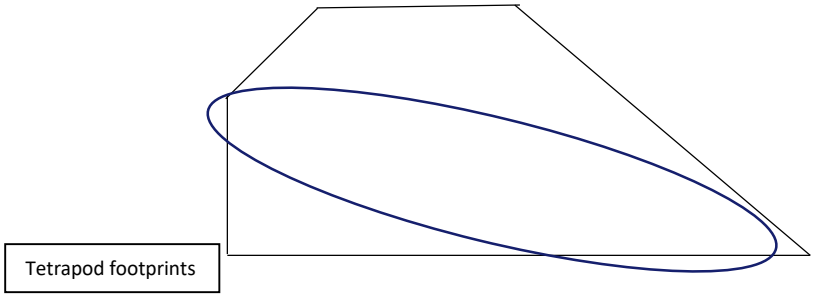
Conglomerate

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	Northern Hemisphere (~ 50° latitude)
Limestone from Tullamore	Southern Hemisphere (~ -80° latitude)
Old Red Sandstone	Equator (0° latitude)
Giants Causeway basalt	Southern Hemisphere (~ -30° latitude)

The following video may be useful to explain this back in class: https://youtu.be/tsrzxTVUEU8

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?

Shows evolution of life moving from ocean to land

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

6. When was the first digital geological map published?

1972	1982	1992	2002	2012

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?

Following railway lines, walking their area and mapping, recording observations in notebooks

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

Tellus plane

RV Keary

Drone

Magnetic susceptibility instrument

Satellite

Compass-clino

Drill rig

Auger

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)

   They map the sea floor by sonar, sampling and geophysics

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?

    When it rains = water table moves up (water being replenished)

    Using well = water table moves down (water being used)

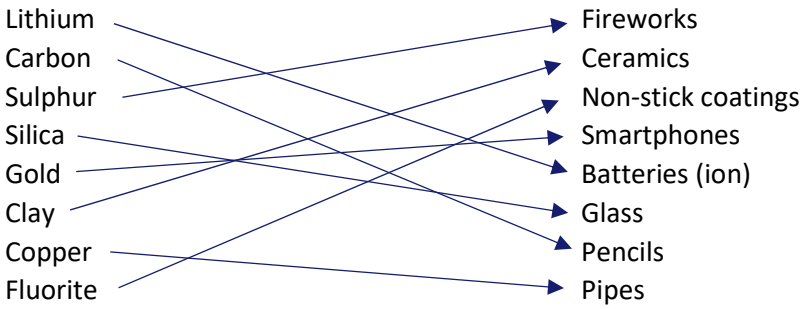
12. Move on to the minerals section and start with the old mine image.
    Navan Mines/ Boliden Tara Mines is the biggest producer of which mineral in Europe?

    Zinc

Marine and Coastal

Groundwater model

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

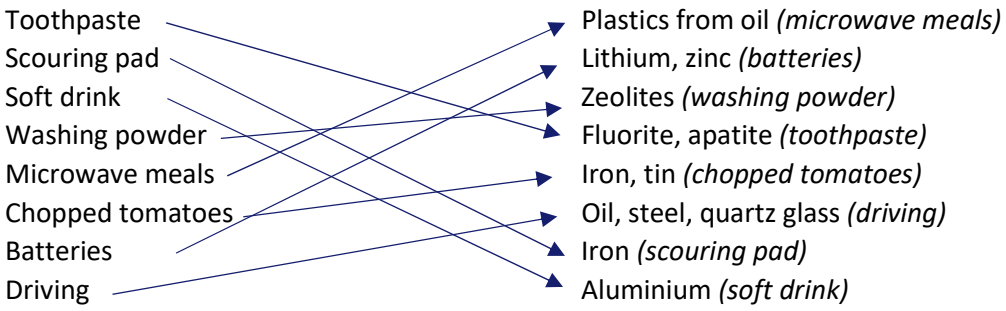


14. Draw or name 5 of the different forms of quartz. Which form is your favourite and why?

Any from: chrysoprase/ milky/ smoky/ (blue) chalcedony/ rose/ citrine/ agate/ obsidian/ synthetic/ silicified wood/ Tiger's eye/ jasper/ amethyst

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!)*



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?

Drill core

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

18. Look behind you at the Tellus section.
How does the Tellus programme map Ireland? Don't forget to check the locker!

Tellus plane – geophysical and magnetic data | Soil sampling and stream sediments – geochemistry data

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)

Named places e.g. Cliffs of Moher, Dingle Peninsula, Ring of Kerry, Connemara, Giants Causeway, Wicklow Mountains
Other places e.g. beaches, mountains, lakes, rivers, fjord, bogs

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.

The larger peaks record the earthquake (when someone has jumped)

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?

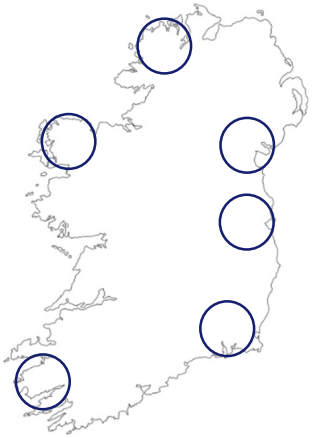


Image: http://www.clker.com/cliparts/W/9/Z/p/N/3/outline-map-of-ireland-hi.png

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?

Tellus

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?

Turloughs

27. Which geohazards are most likely to affect Ireland? 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.

The future