

MAGNA DRILLERS

SAVE PLANET EARTH



VOLCANOLOGIST

Mission 2: Energy from magma

It is the year 2035, natural disasters ravage the planet. The world is recovering from years of environmental exploitation under Donald Trump (who tragically died after a freak wave of plastic burger boxes buried him during a beachside golf tournament). Kim Kardashian is now president of the United States; her revolutionary thinking leads the world in a search for cleaner energy and an effort to become better guardians of the natural forces around us. She has chosen you to be part of team to push the limits of science, technology, and bravery to save the planet.

In order to complete this mission, you will have to watch both the “energy from magma” video and the volcanologist video for this mission.

Again, you will be asked to collaborate with other scientists in order to achieve your goals. You will use what you have learnt so far to help you locate two different types of magma.

The information on the following page will help you answer the questions below. Once you are confident about your answers to those questions, you will be able to report back to your team and help make a final decision on where to drill to intercept magma bodies.

Magma types

There are two major types of magmas, basalt and rhyolite magmas. Magma are differentiated by their chemistry. The different chemistry gives the magma different physical properties, including temperature, viscosity (how runny a magma is) and eruption explosivity.

Magma body shape

Magma frequently travels through cracks and defects in rocks to make its way to the surface. If the magma travels in a vertical crack, then it is called a dyke. If it travels in a horizontal crack, it is called a sill. In some cases, magma ponds to form large blobby-shaped bodies, known as magma chambers.

Question 1

Which magma type is hotter and less dense?

Magma Type	Temperature	Stickiness
Basalt		
Rhyolite		

Question 2

Draw a dyke, draw a sill and blob from the side.

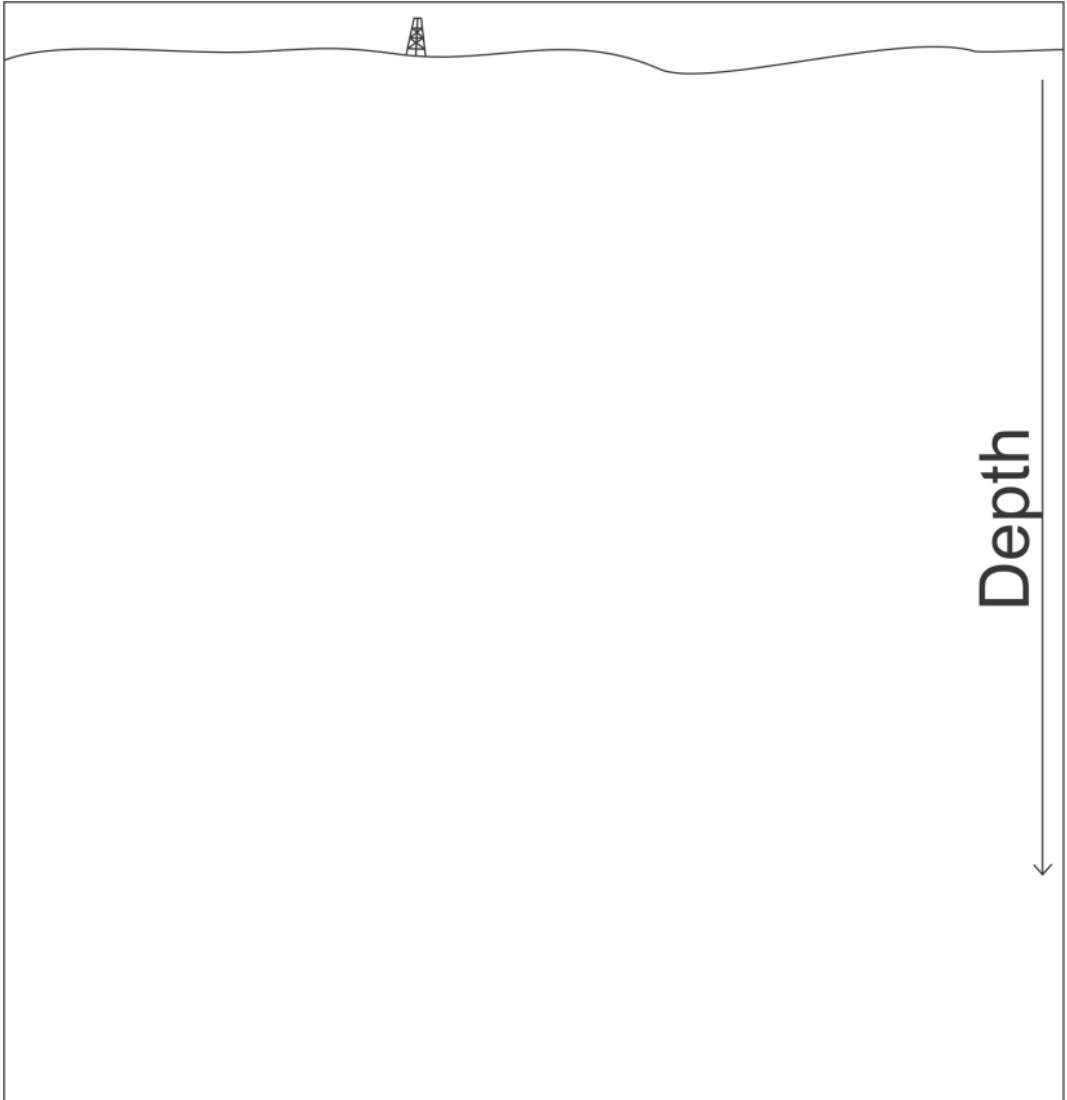
Dyke	Sill	Blob

Draw a dyke, draw a sill and blob from the top.

Dyke	Sill	Blob

Question 3

Sketch what the basalt and rhyolite magma bodies might look like under Krafla. Clearly label the type of magma in your sketch.



Drilling planning evaluation

Did everyone on the team share information that helped make the final decision?

How well did your team communicate to achieve its goals? What could improve your communication in the future?

Did your plan address all the potential risks and hazards?

Was your mission cost effective?

Did your drilling plan meet all requirements for the mission?

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