How does a geyser work?

Note: in British English geyser is said: geezer; and in US English it is said: Gy-zer. Funny world!

ENGLISH

Reading and comprehension

Read this information and answer the questions below:

Paragraph 1
A geyser is a natural fountain of boiling water. But it is only the most famous of many water features connected to hot, volcanic rocks.

Paragraph 2
The rocks need to be cracked, to let water move about, and deep down – perhaps 2000m below the surface – there needs to be a source of heat. If the cracks in the rock are big, cold water can seep down, and hot water can seep up past it. It's like turning on the hot water tap in your kitchen sink. The hot water simply bubbles out of the ground and is called a hot spring. If it is very muddy bubbling water, it is called a mudpool. Sometimes there is only enough moisture among the cracks in the rocks to make fumes.

Paragraph 3
So why are there hot rocks underground? Not all volcanoes are 'alive' (active) all the time. Some 'sleep' (dormant) for a bit then burst into action (erupt). In the time when they are not erupting, they don't fade away. Hot rock is always there below the surface.

Paragraph 4
Think of a 'sleeping' volcano as an underground stove and kettle. The hot rocks are the stove, and the cold water seeping down is the same as filling a kettle from a tap. This natural kettle heats up any water seeping down from a stream or rain or snow melting. The water seeps down the cracks between broken rocks. It gets heated up more or less to boiling point.

Paragraph 5
The reason people know about geysers is because they are very dramatic. They suddenly spurt out of the ground as a fountain of steam and boiling water. But they are also rare. They only form where the cracks are sealed tight. The area around Yellowstone National Park in North western United States, and Iceland, are the most famous sites of geysers.

Paragraph 6
Think of fur in a kettle. It is made of rock dissolved in the water. It comes out as a white fur when water is heated to boiling point. In a geyser pipe another kind of 'fur' forms as dissolved rocks comes out of solution and coats the walls of the pipe. This makes it pressure tight. The same rock makes the geyser cone you have seen in the video. When sealed cracks are narrow, water that has been heated up finds it very difficult to bubble up past the cold water seeping down. The cold water acts like a lid. So the hot water simply gets hotter and hotter. Trapped hot water can get well above normal boiling point. The hotter it gets, the more pressure it builds up. Eventually the boiling water is under so much pressure it bursts out through all the cold water above, throwing steam and cold water into the air, and that is when you get a geyser.

Paragraph 7
After a short while, 4 minutes in the case of Old Faithful, the burst of hot water stops, because it literally runs out of steam, and the process starts all over again. That is the reason geysers send out fountains in fits and starts. Most are very irregular in timing. Old Faithful gets its name because it is unusually regular in its timing.

Questions

Paragraph 1. A geyser is….(complete the sentence).

Paragraph 2: How far underground does water have to seep before it gets hot enough to make a geyser?

Paragraph 2: Name two other kinds of natural hot water.

Paragraph 3: Name the three stages of a volcano.

Paragraph 3: Which stage is connected to hot springs and geysers?

Paragraph 5: How do geysers come up from the ground?

Paragraph 6: How do the geyser pipe walls become sealed tight?

Paragraph 7: How did Old Faithful get its name?

Summarising

In the book linked to this topic, open it at page 11. Write how a geyser erupts in your own words.

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MATHS

Turn text into numbers

Maths questions based on the topic

1. Old Faithful geyser is not quite as faithful as you might imagine. It erupts every 44 minutes to two hours. There are benches nearby for people to sit and wait. What is the longest someone would have to sit on a bench? Give your answer in minutes.

(Answer: time in hours multiplied by 60)

2. The geyser throws out 14,000 to 32,000 litres of boiling water to a height of 32 to 56 metres lasting from 1½ to 5 minutes. The average height of an eruption is 44. What is the average amount of water thrown out?
(Answer To get an average, add the two numbers and divide by 2.)