Hazards: Vulcanicity - forms and causes *3.1.5.3* ANSWERS

Q1	***Match the terms with their descriptions***	
A	Large angular fragments ejected during explosive eruptions	**pyroclasts**
B	Fine material ejected during volcanic eruptions	**Ash fallout**
C	Hot molten rocks which move down the side of a volcano	**Lava flows**
D	Water mixed with ash flows down the volcano's flanks	**Lahars**
E	These include hydrochloric acid and sulphur dioxide	**Volcanic gases**
Select from: **lava flows** **mudflows** **pyroclasts** **volcanic gases** **ash fallout**		

Q2	**Tick whether these characteristics are for rhyolitic or basaltic magma**	**rhyolitic**	**basaltic**
A	High viscosity	✓	
B	Low silica content		✓
C	Catastrophic eruption	✓	
D	High gas content	✓	
E	High temperature magma		✓
F	Fluid magma		✓
G	Effusive eruptions		✓

Q3	**Tick the one hazard out of each trio that is the most dangerous**			
A	Clouds	**volcanic gases**	**ash**	**tephra**
		✓		
B	Flows	**lava flows**	**lahars**	**pyroclastic flows**
				✓
C	Secondary hazards	**lahars**	**thunderstorms**	**forest fires**
		✓		
D	Lavas	**basaltic**	**rhyolitic**	**andesitic**
			✓	
E	Eruption type	**terrific**	**explosive**	**effusive**
		✓		

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Q4	***How would the aftermath of the 1991 Mount Pinatubo eruption have been different if these variables were changed?***

Type of magma	***Type of housing***
If the magma were basaltic in nature the eruption would have been… Much less explosive, so it may not have had huge pyroclastic flows and less people would have died	If houses had been built with concrete roofs… Many of the deaths occurred where roofs collapsed under the weight of ash. With strong roofs there would have been less deaths.
Evacuation procedures	***Monsoon season***
If there was no evacuation order, then … There could have been as many as 20,000 deaths or more, as far more people would have been closer to the volcano when it erupted.	If the eruption had occurred after the monsoon season then… There would have been far less rainfall and therefore far fewer lahars formed. This would have significantly reduced the death toll (as most deaths were as a result of the lahars that occurred after the eruption).

Q5	***Compare and contrast the types of volcanic hazards associated with constructive and destructive plate margins***

Constructive plate margins:

- Lava flows are common.
- Effusive eruptions are associated with constructive plate margins, hotspots and the formation of shield volcanoes.
- These volcanoes form from low-viscosity, basaltic lava, which travels over long distances.
- Shield volcanoes tend to erupt frequently due to the fluid nature of basaltic magma creating low wide volcanoes

Destructive plate margins:

- Pyroclastic flows, volcanic bombs, ash and lahars are common.
- Explosive eruptions eject rock, tephra and ash and volcanic gases.
- Composite volcanoes tend to erupt infrequently due to the viscous nature of rhyolitic or andesitic magma.
- Volcanoes are large and steep.
- Volcanic gases include hydrochloric acid, which condenses with water vapour and is rained out, as well as sulphur dioxide.
- Sulphur dioxide emissions can cause acid rain, ozone depletion and air pollution. Mount Pinatubo ejected between 10 and 20 million tonnes of sulphur dioxide gas into the atmosphere during the volcano's eruption on 15 June 1991.