



MOUNTAINS

DISCOVER
THE SECRETS!



MUSLIM
EXPLORERS

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INSPIRATION

القرآن الكريم

The word mountain in both the singular and plural forms is explicitly mentioned in the Quran 39 times (6 in the singular and 33 in the plural), and is clearly implied as stabilizers for the Earth's crust in 10 other verse. These 49 Qur'anic verses can be classified in distinctive categories in which mountains are referred as ;

HIGHLY ELEVATED LANDFORMS (2:260, 11:43)

IDENTICALNESS OF MOUNTAINS (11:42 and 24:43)

HISTORICAL IMPORTANCE (7:74, 15:82 and 26:149)

SCENES OF PERFORMED MIRACLES (2:260 and 7: 143, 171)

COMPOSITION OF ROCKS OF VARIOUS COLOURS & ORIGINS (35:77)

GREAT MASSIVE SOILD (13:31, 14:46, 17:37, 19:90, 33:72 and 59:21)

USEFUL FOR ANIMALS AND HUMANS (13:3, 16:25, 27:61 and 77:27)

MIRACULOUS SYSTEM BY WHICH MOUNTAINS ARE SET-UP (88:19)

TRUE WORSHIPPERS OF THEIR CREATOR (21:79, 22:28, 34:10 and 38:18)

NONSTATIONARY BODIES THAT FOLLOW EARTH'S MOVEMENT (27:88)

PEGS THAT HOLD THE EARTH'S SURFACE AND STABILIZERS FOR EARTH'S CRUST (13:3, 15:19, 16:15, 21:31, 27:61, 31:10, 41:10, 50:7, 77:27 and 79:32)

DESTRUCTION ON THE DAY OF JUDGEMENT (18:47, 20:105, 52:10, 56:5, 69:14, 70:9, 73:14, 77:10, 78:20, 81:3 and 101:5)

وَهُوَ الَّذِي مَدَّ الْأَرْضَ وَجَعَلَ فِيهَا رَوَاسِيَ وَأَنْهَارًا وَمِنْ كُلِّ الثَّمَرَاتِ
 جَعَلَ فِيهَا زَوْجَيْنِ اثْنَيْنِ يُغْشَى اللَّيْلَ النَّهَارُ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِّقَوْمٍ
 يَتَفَكَّرُونَ ﴿٣﴾

And it is He who spread the earth and placed therein firmly set mountains and rivers; and from all of the fruits He made therein two mates; He causes the night to cover the day. Indeed in that are signs for a people who give thought. (Ar-Radh: 3)

أَمْ جَعَلَ الْأَرْضَ قَرَارًا وَجَعَلَ خِلَالَهَا أَنْهَارًا وَجَعَلَ لَهَا رَوَاسِيَ وَجَعَلَ بَيْنَ
 الْبَحْرَيْنِ حَاجِزًا أَءِلهُ مَعَ اللَّهِ بَلْ أَكْثَرُهُمْ لَا يَعْلَمُونَ ﴿٦١﴾

Is He [not best] who made the earth a stable ground and placed within it rivers and made for it firmly set mountains and placed between the two seas a barrier? Is there a deity with Allah? [No], but most of them do not know. (An_Naml:61)

وَجَعَلَ فِيهَا رَوَاسِيَ مِنْ فَوْقِهَا وَبَرَكَ فِيهَا وَقَدَّرَ فِيهَا أَقْوَاتَهَا فِي أَرْبَعَةِ أَيَّامٍ سَوَاءً لِّلْسَائِلِينَ
 ﴿١٠﴾

And He placed on the earth firmly set mountains over its surface, and He blessed it and determined therein its [creatures'] sustenance in four days without distinction - for [the information] of those who ask. (Fussilat: 10)

وَالْأَرْضَ مَدَدْنَاهَا وَأَلْقَيْنَا فِيهَا رَوَاسِيَ وَأَنْبَتْنَا فِيهَا مِنْ كُلِّ زَوْجٍ بَهِيجٍ ﴿٧﴾

And the earth - We spread it out and cast therein firmly set mountains and made grow therein [something] of every beautiful kind, (Qaf: 7)

LAYERS OF EARTH

The body of our planet consists of a number of concentric shells from the outer space to the inner core. Different materials are arranged in order of increasing density.

LAYERS OF EARTH'S ATMOSPHERE



The *Troposphere* is the layer that contains *oxygen* in a proportion suitable to sustain life on earth. The weather is formed in troposphere. It's about 7 to 16 km above the earth's surface. It gets cold near the top as low as -75°C . *Weather* is formed in troposphere. It is where the *clouds* are formed.

LAYERS OF EARTH'S INTERIOR

CRUST:

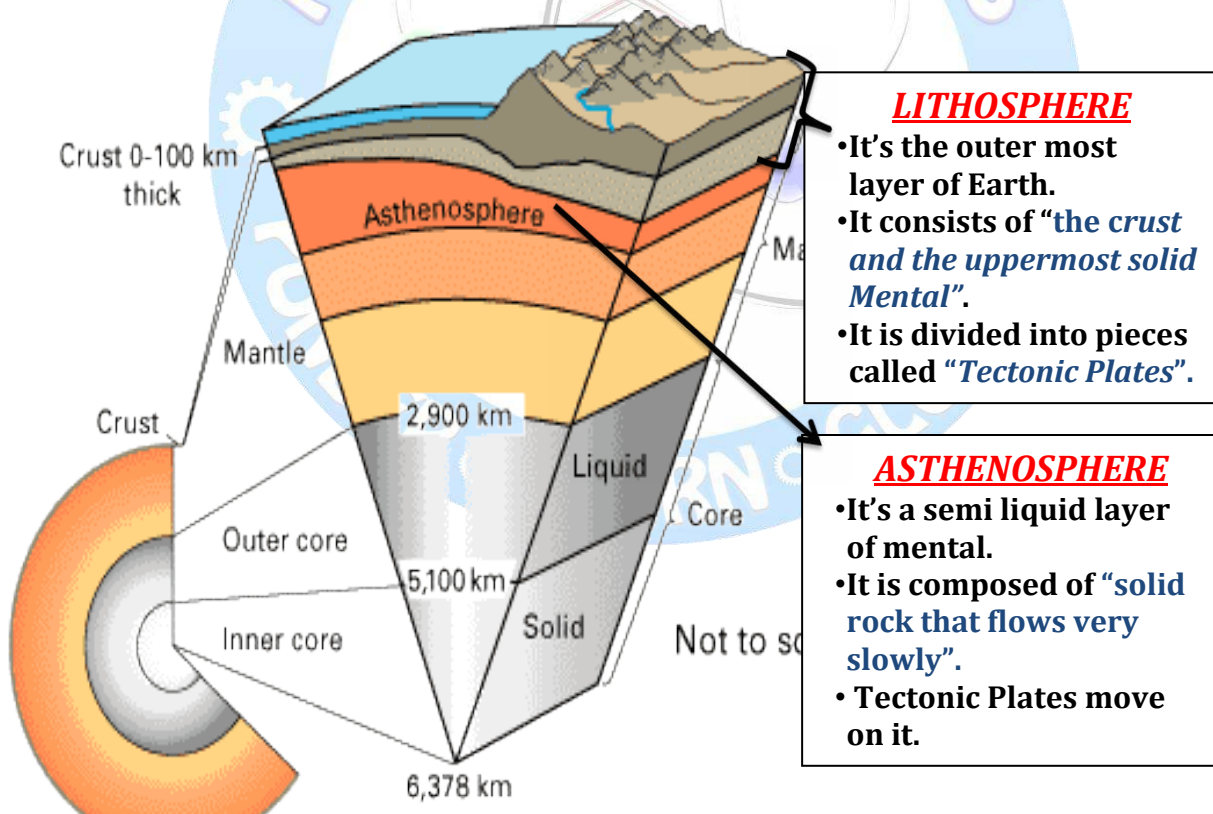
It is less than 1% of the Earth's mass. It's about 5km to 100km thick. There are two types of the crust, continental crust and the oceanic crust. Continental Crust is thicker but less dense than the oceanic crust.

MENTAL:

It is 67% of Earth's mass. It is very thick to drill; scientists don't exactly know what lies beneath. Based on observations made on the surface it is believed to be made up of molten or semi molten rocks.

CORE:

It is 33% of Earth's mass. It is believed that inner core is a solid ball of iron, while the outer core contains iron and nickel in liquid state.



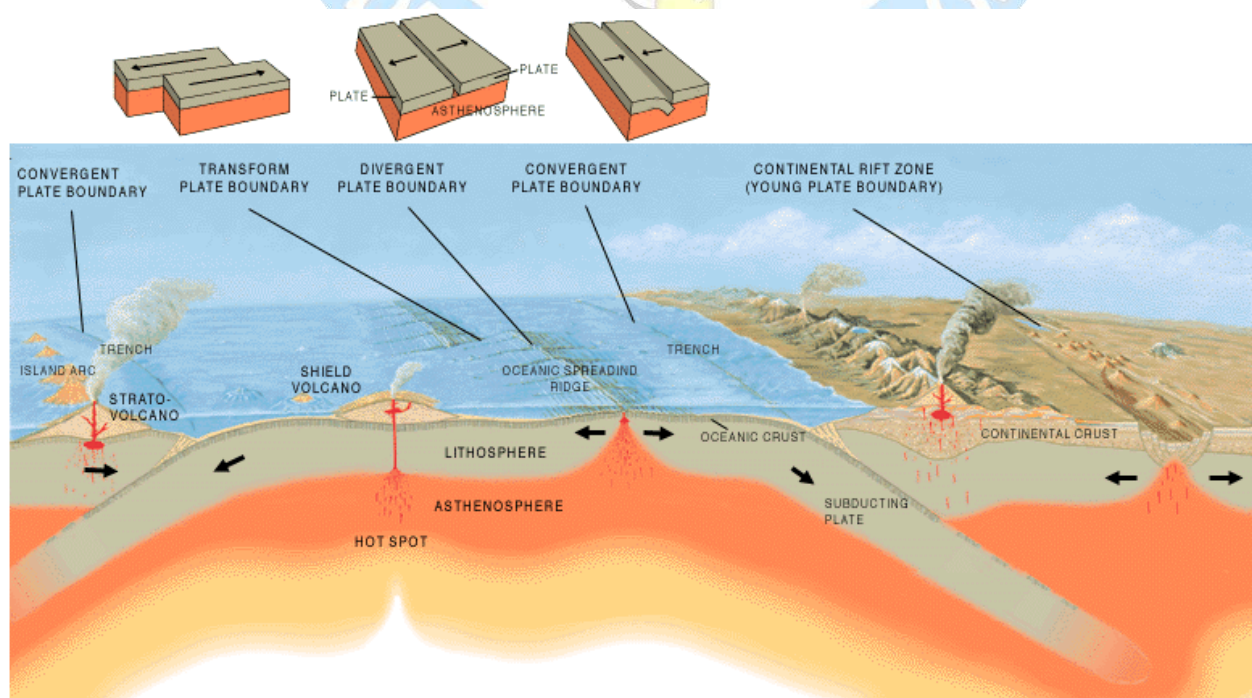
The lithosphere is like a giant jigsaw puzzle and tectonic plates are like the pieces of that jigsaw puzzle. Each plate fits perfectly with the plates surrounding it.

PLATE TECTONICS

Plate tectonics is a theory dealing with the dynamics of Earth's outer shell, "Lithosphere". The concept of plate tectonics was formulated in the 1960s. The plates are constantly floating around the planet i-e they move a few centimeters each year.

- There are **eight major plates** on the surface of the Earth.
- There are also bunches of **minor plates** on the Earth.
- **Plate boundary zones** occur where the effects of the interactions are unclear and may show various types of movements in different episodes;
 - When the plates spread apart, it's called a **spreading center**.
 - When they are moving together, it's called a **subduction zone**.
 - When they are forced together, it's called a **zone of convergence**.

One of the plates usually moves under the other in a zone of convergence. As the plate moves down into the asthenosphere it begins to melt. The place where they meet has a crack or a trench. Some of the deepest parts of the oceans are these trenches.



MOUNTAINS

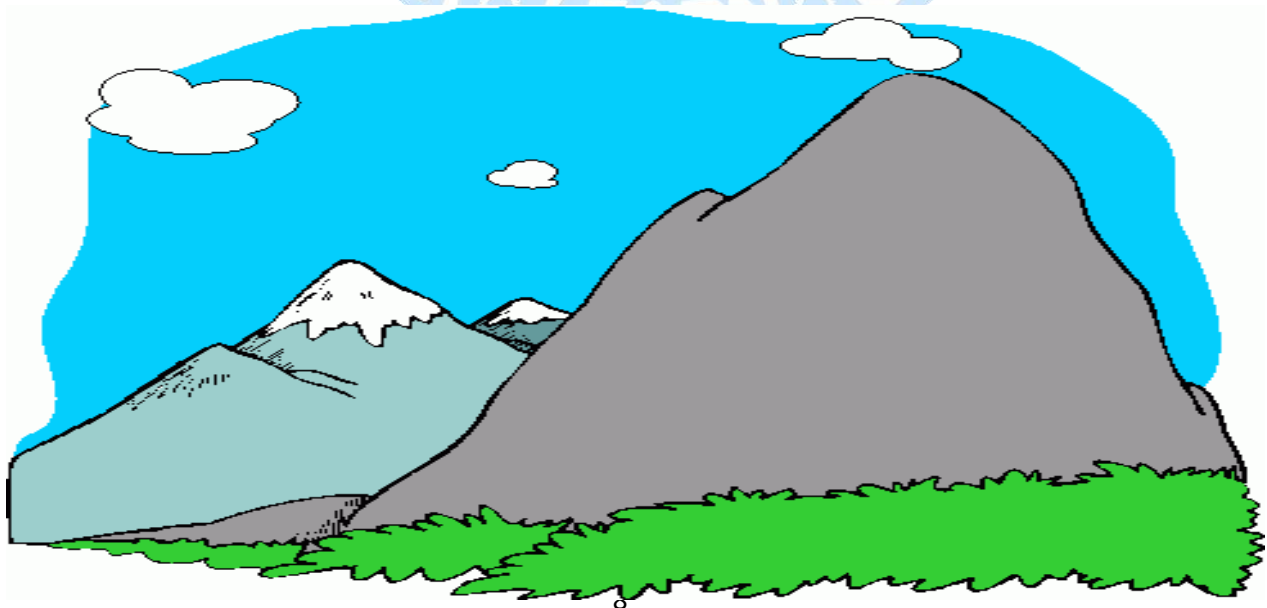
Mountains are formed by tectonic forces or volcanism. These forces can locally raise the surface of the earth. Mountains erode slowly through the action of rivers, weather conditions, and glaciers. A few mountains are isolated but most occur in huge mountain ranges. Formation of mountains is associated with large-scale movements of the earth's crust i-e **PLATE TECTONICS**. This movement can result into a number of phenomenons like;

- FOLDING
- FAULTING
- VOLCANIC ACTIVITY
- IGNEOUS INTRUSION
- METAMORPHISM

TYPES OF MOUNTAINS

There are three main types of mountains are formed from plate tectonics i-e when portions of the Earth's crust move, crumple, and dive.

- VOLCANOES
- FOLD MOUNTAINS
- BLOCK MOUNTAINS



VOLCANOES

A volcano opens downward to a pool of molten rock below the surface of the earth. When pressure builds up, eruptions occur.

Movements of tectonic plates create volcanoes along their boundaries, which erupt and form volcanic mountains.

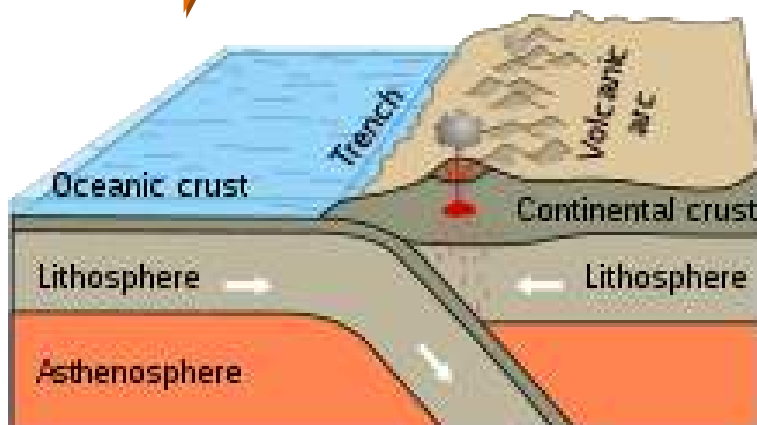
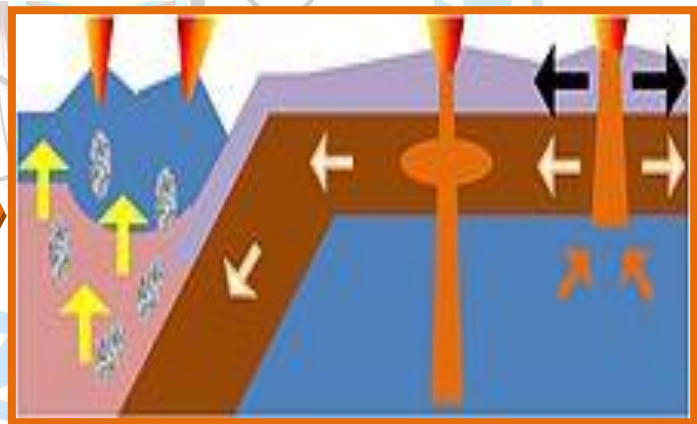
A volcanic arc system is a series of volcanoes that form near subduction zone where the crust of a sinking oceanic plate melts.



Volcanoes associated with a subduction (left).

A volcano with the spreading ridge (right).

A hotspot volcano is in center.



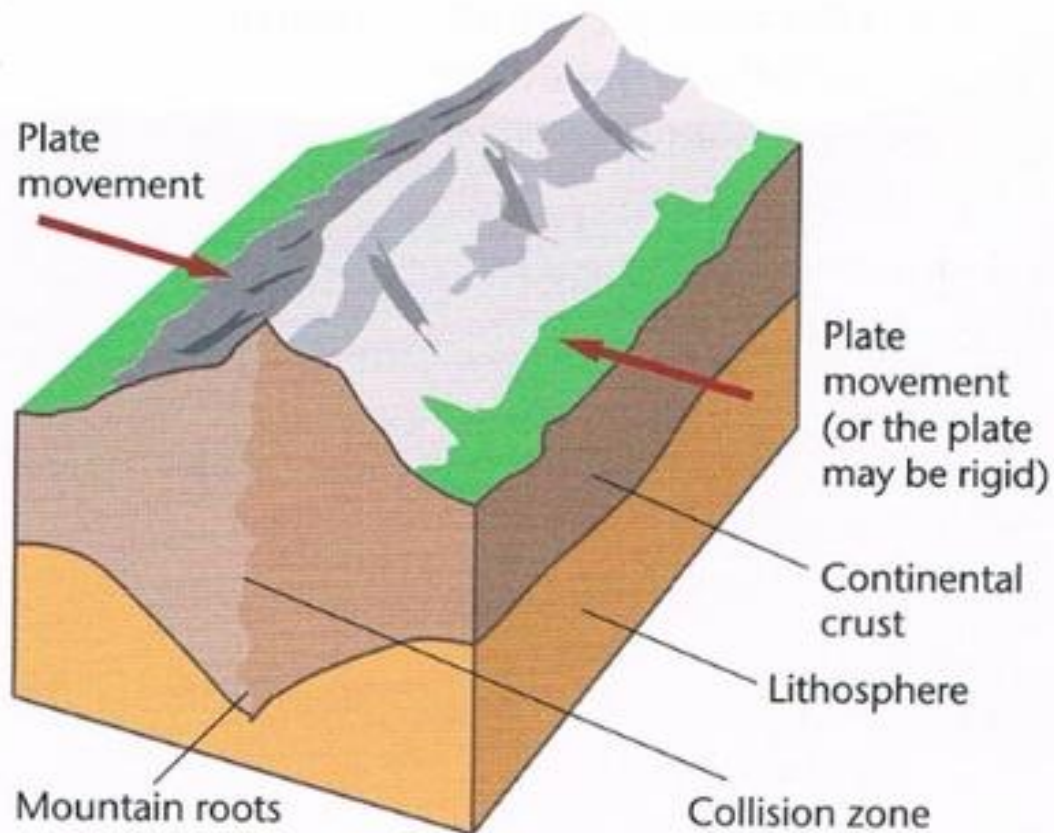
FOLD MOUNTAINS

Fold mountains are formed when two plates formed of continental crust collide or undergo subduction (i-e ride one over another).

Neither of the plates is dense enough to sink beneath the other.

The plates tend to buckle and fold, eventually forming thick layers.

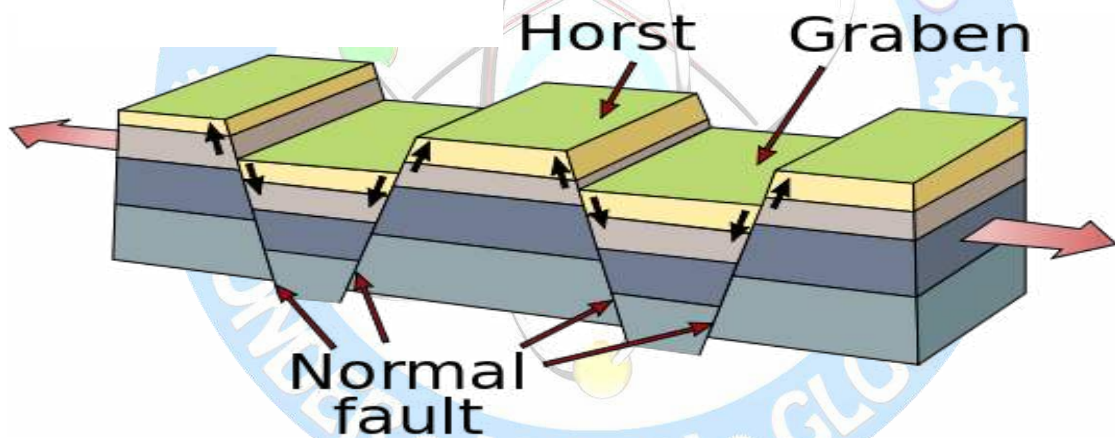
Mountain ranges have formed in this way, the Alps and the Himalayas.



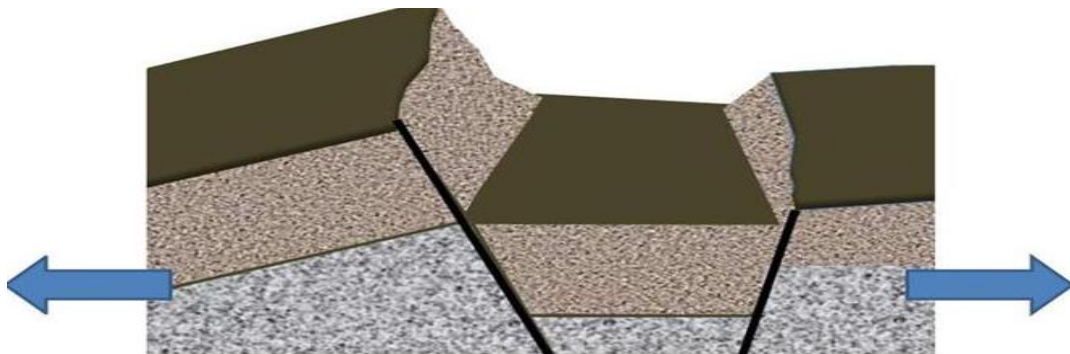
FAULT-BLOCK MOUNTAINS

FAULT is a planar discontinuity or a fracture in a volume of rock.

When a fault block is lifted or tilted, Block Mountains can result.



LIFTED BLOCK MOUNTAINS They have two steep sides and both are with an exposed scarp.



TILTED BLOCK MOUNTAINS These Mountains have one gently sloping side and one steep side with an exposed scarp.

DO YOU KNOW?

وَأَلْقَى فِي الْأَرْضِ رَوَاسِيَ أَنْ تَمِيدَ بِكُمْ وَأَنْهَارًا وَسُبُلًا
لَعَلَّكُمْ تَهْتَدُونَ ﴿١٥﴾

And He has cast into the earth firmly set mountains, lest it shift with you, and [made] rivers and roads, that you may be guided, (An-Nahl: 15)

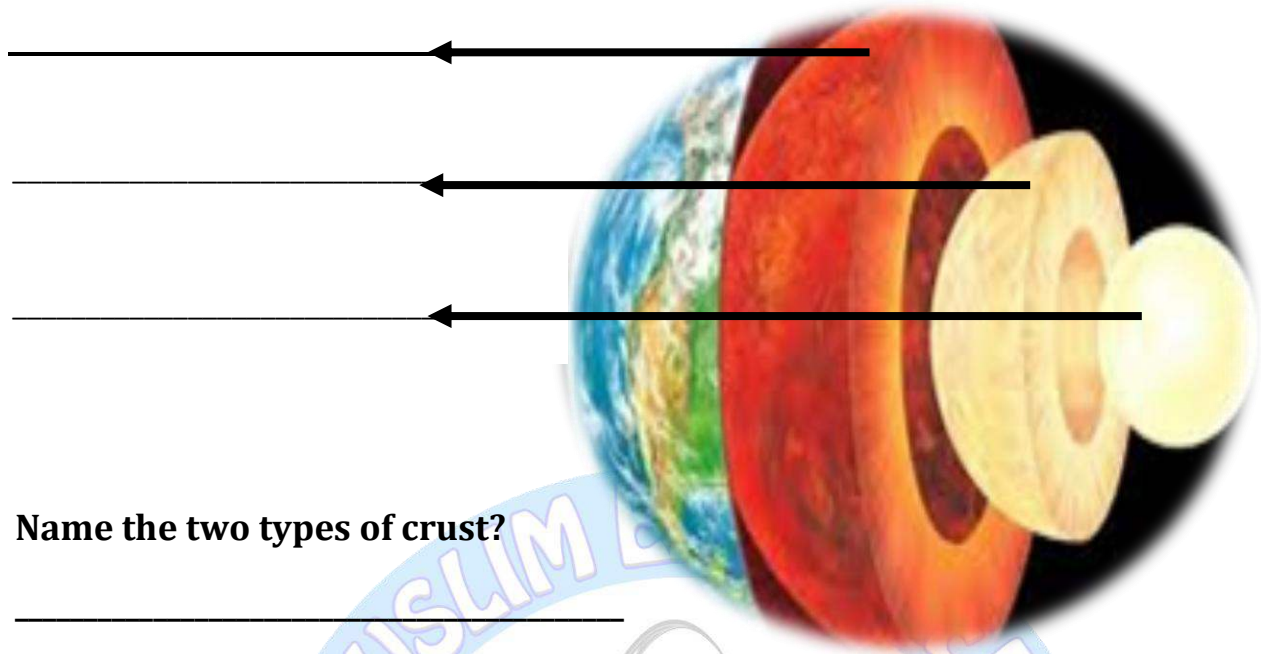
How the verse inspires you?

Can you recall the names of the layers of our atmosphere?

Which layer contains the perfect amount of oxygen suitable for life?

Can you name the layers that are made up of metals?

Can you name the layers of Earth's interior?



Name the two types of crust?

What is Earth's Mantle made up of?

In which part of Earth's interior does the "asthenosphere" lie?

Can you define the intermediary layer "lithosphere"?

What are plates? Where do they float?

What do you understand by the Theory of Plate Tectonics?

Can you recall the ways the plates move?

How do mountains form?

Name a few ways how mountains are formed?

Name a few types of mountains?

How volcanoes are formed?

Which mountains are formed when two equally dense plates converge?

What is a Fault?

Draw and explain the difference these:

Uplifted Block Mountains	Tilted Block Mountains

MOUNTAINS AS PEGS

أَلَمْ نَجْعَلِ الْأَرْضَ مِهْدًا ۖ ﴿٦﴾ وَالْجِبَالَ أَوْتَادًا ۖ ﴿٧﴾

Have We not made the earth a resting place? And the mountains as stakes(pegs)?
(An-Naba 6-7)



Figure 8: Schematic section. The mountains, like pegs, have deep roots embedded in the ground. (*Anatomy of the Earth*, Cailleux, p. 220.)

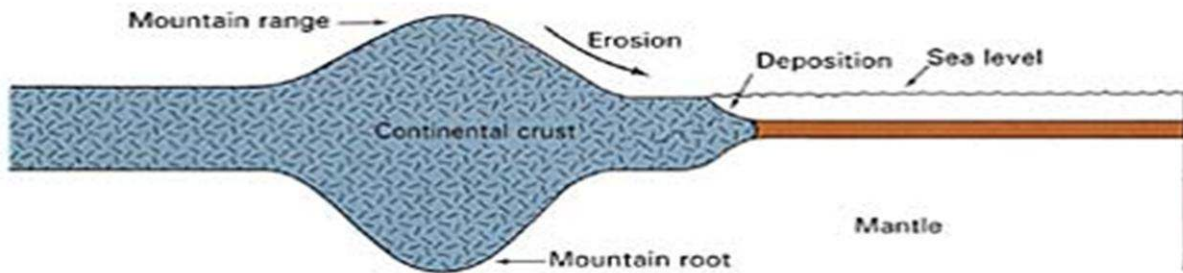


Figure 9: shows how the mountains are peg-like in shape, due to their deep roots. (*Earth Science*, Tarbuck and Lutgens, p. 158.)

Modern earth sciences have proven that mountains have deep roots under the surface of the ground and that these roots can reach several times their elevations above the surface of the ground.

So the most suitable word to describe mountains on the basis of this information is the word 'stake/peg,' since most of a properly set peg is hidden under the surface of the ground. This is how the noble Quran describes the mountains.

MOUNTAINS AS STABILIZERS

وَجَعَلْنَا فِي الْأَرْضِ رَوَاسِيَ أَنْ تَمِيدَ بِهِمْ وَجَعَلْنَا فِيهَا فِجَاجًا

سُبُلًا لَعَلَّهُمْ يَهْتَدُونَ ﴿٣١﴾

And We placed within the earth firmly set mountains, lest it should shift with them, and We made therein [mountain] passes [as] roads that they might be guided.

(Al-Anbya:31)

The modern theory of plate tectonics holds that mountains work as stabilizers for the earth. This fact has been stated in the noble Qur'an. This knowledge about the role of mountains as stabilizers for the earth has just begun to be understood in the framework of plate tectonics since the late 1960's.

وَالَّذِي نَزَّلَ مِنَ السَّمَاءِ مَاءً بِقَدَرٍ فَأَنْشَرْنَا بِهِ بَلْدَةً مَيْتًا كَذَلِكَ

نُخْرِجُونَ ﴿١١﴾

"Allah (God) Almighty who sends down from the sky water in predetermined quantities to revive a dead land and as such you (humans) will be resurrected."

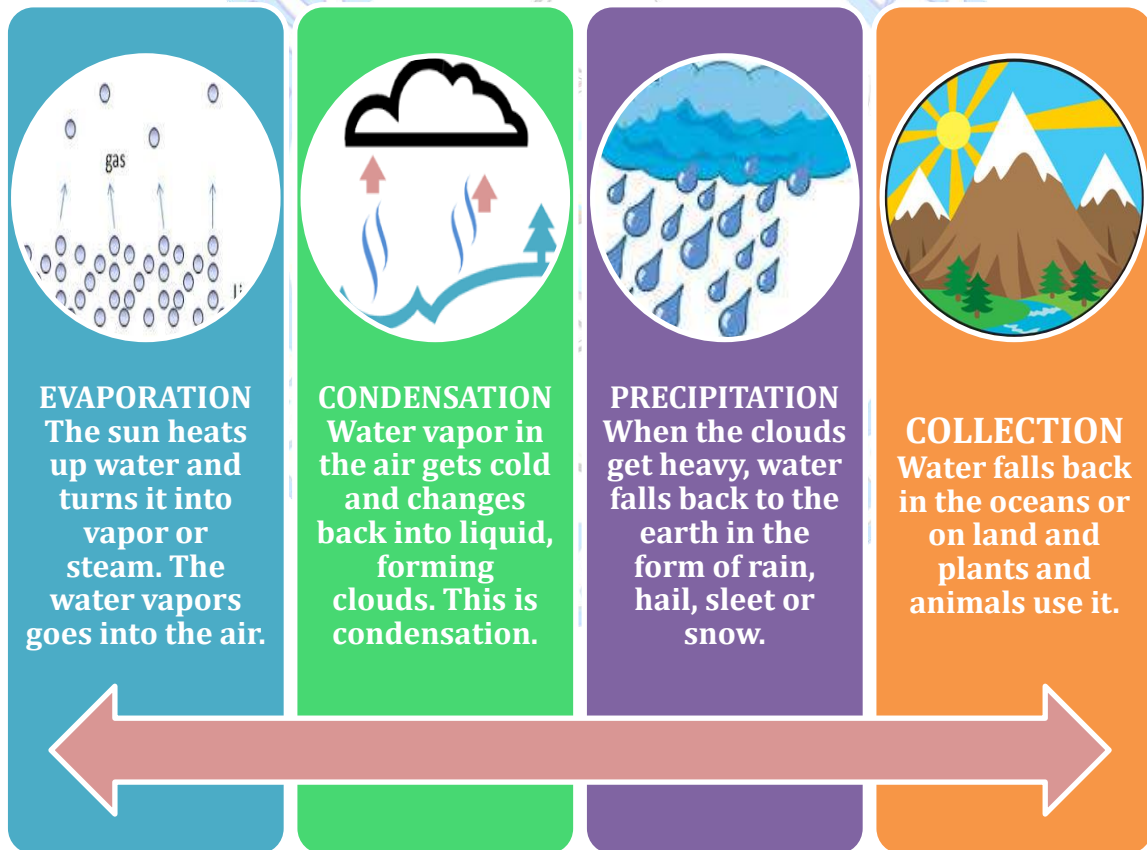
(Az-Zukhruf :11)

MOUNTAINS AS WATER SOURCES

وَجَعَلْنَا فِيهَا رُءُوسَ سَمِيخَاتٍ وَأَسْقَيْنَاكُمْ مَاءً فُرَاتًا ﴿٢٧﴾

“And have placed therein firm, and tall mountains, and have given you to drink sweet water?” (Al-Mursalât: 27)

WATER CYCLE

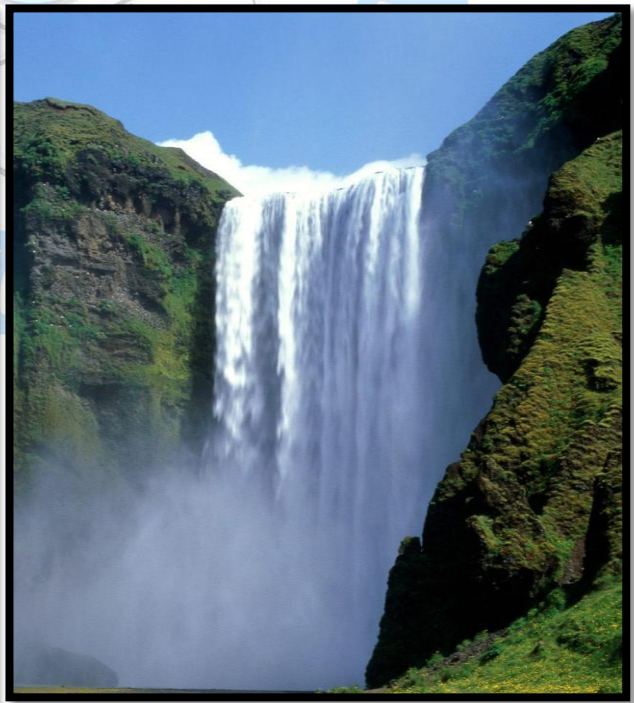


The earth has a limited amount of water. This water keeps going around and around in Water Cycle. An important step of water cycle is *Condensation* i-e cloud formation. *Mountains* help in forming the clouds. The tops of mountains are covered with clouds all the year.

MOUNTAINS AS WATER SOURCES

Mountains work as a bumper for the air to slide on its surface, which helps in the acceleration of the loaded air by water vapor and cools it to form the clouds. The taller the mountain the more amounts of clouds is formed to produce rains or ice.

- ❖ Clouds are responsible for the descending of rains and also in forming ice which dissolves to make fresh and sweet water.
- ❖ This water is then dissolved and leaked through the mountains to form fresh and sweet springs.
- ❖ Scientists say that springs are formed in near of the mountains and its water is fresh and palatable.
- ❖ Water of springs which come from the high mountains passed through many filtration operations, so that the high mountain works as a filtration machines.
- ❖ Without the mountains, even a one drop of water wouldn't be descended!



DISTINCTIVE MOUNTAINS

TOOR-E-SEENA

- ❖ *Allah the Almighty Spoke to Musa(A.S) and was given the prophet hood and also the miracles of staff (snake) and shinning hand.”(20: 9-24)*
- ❖ *Musa (A.S) received the Torah here. (6:151-152)*
- ❖ *Musa (A.S) received the command of fasting for 30 days, (7:142)*
- ❖ *When Musa returned with the Commands, those orders became heavy on Bani Israel and they didn't want to implement them until Allah raised the Toor over them. (4:154)*

MOUNTAINS OF UHAD

The Messenger of Allah, peace and blessings be upon him, said, “Verily, the mountain of Uhud loves us and we love it.”

- ❖ *Mount Uhud is in the north of the Madinah. The Uhud is actually a group of mountains.*
- ❖ *These mountains have a total length of 7 kilometers and are about 3 kilometers wide. Mount Uhud has a height of 1,077 meters. It is the place where the famous Uhud battle was fought in the year 625.*
- ❖ *God's Noble Messenger (PBUH) climbed Mount Uhud together with Abu Bakr al-Siddiq, 'Umar al-Faruq, and 'Uthman Dhi'n-Nurayn. Either due to their awesomeness, or out of its own joy and happiness, the mountain began to tremble and stir. God's Messenger said: “Steady! For upon you are a prophet, a veracious one (siddiq), and two martyrs!”*

JABAL-AR-REHMAH

- ❖ *It is a granite hill east of Mecca in the plain of Arafat, about 20 km Southeast of Mecca. It is about 70 m in height.*
- ❖ *The hill is the place where the prophet Muhammad (S.A.W) delivered the Farewell Sermon to the Muslims.*
- ❖ *After being taken out of Jannah and placed on Earth, it was here that Adam (A.S) and Hawa met up.*
- ❖ *Standing on Arafat is an essential part of the Hajj; whoever misses the standing on Arafat has missed Hajj, because the Prophet (S.A.W) said: “Hajj is Arafat.”[al-Hakim]*

MOUNT JUDI

"O earth! Swallow up thy waters! And, O sky, cease [thy rain]!" And the water sank into the earth, and the will [of God] was done, and the ark came to rest on Mount Judi. And the word was spoken: "Away with these evil doing folk!" (11:44).

- Islamic traditions identify Mount Judi or Qardu as PLACE OF DESENT of Noah's Arc.
- It's a peak near the town of Jazirat ibn Umar (modern Cizre), at the headwaters of the Tigris, near the modern Syrian-Turkish border.
- Arab historian Al-Masudi (d. 956), reported that the spot where the ark came to rest could be seen in his time. Traveler Ibn Battuta passed by the mountain in the 14th century.

ABU- QUBAIS

It's the first ever Mountain created by Allah Almighty. This mountain is directly opposite the Ka'aba close to Mount Safa. Hazrat Adam [A.S] took rocks from this mountain when he built the Ka'aba very first time on earth. After building the Ka'aba, Prophet Ibrahim [A.S] stood on this mountain and called mankind to worship Allah. At the time of Hazrat Noah [A.S] flood the Hajrey Aswad [The Black Stone] was placed over this mountain. When the Holy Prophet [PBUH] first started preaching Islam publicly, he stood on Jabal Abu Qubais and called mankind to submit to Allah.

AL-Safa AND AL-MARWAH

Al-Safa and Al-Marwah are two small hills located in the Masjid-al-Haram in Mecca, Saudi Arabia between which Muslims travel back and forth seven times during the ritual pilgrimages of Hajj and Umrah. Ibrahim was commanded by Allah to leave his wife Hajra and their infant son alone in the desert between Al-Safa and Al-Marwah with only basic provisions to test their faith. When their provisions were exhausted, Hagar went in search of help or water. She went alone, leaving the infant Ismail on the ground. She first climbed the nearest hill, Al-Safa, to look over the surrounding area. When she saw nothing, she then went to the other hill, Al-Marwah, to look around. Hagar travelled back and forth between the hills seven times in the scorching heat before returning to her son. When she arrived, she found that a spring had broken forth from where the Angel Jibreel hit the ground with his wing. This spring is now known as the Zamzam Well, and was revealed by the angel of God as both sustenance and a reward for Hagar's patience.

DO YOU KNOW?

How can you define the mountains as pegs?

Name a few ways how mountains are important for life on our planet?

What does the term "Mountain Root" means?

Recall the steps of water cycle?

What role do mountains play in cloud formation?

How mountains serve as a source of fresh water to us?

