Welcome to another session

of paper minerals and

rock.

Today we are going to.

Start with the topic introduction to plate tectonics.

Our Earth is a active planet.Various geological events

like earthquakes, volcanic eruptions are being

experienced from time to time.

Now you look at this world map.

You must be very much familiar

with it. If you look carefully at the continents, you will

notice that all they almost look like pieces of a jigsaw puzzle

like they fit together,especially if you look at the

eastern coast of South America and the West coast of Africa.

They look like they would fit into each other.

Here, look at this map now.

We can observe all continents here, but they are not in the

same position where we can locate them today.

Well , in 1960s, geologists develop the plate tectonic

theory, which explains all these geological events.

Play tectonics theory states that the Earth's outer layer,

the lithosphere is divided into large continent size plates.

That is constantly moving.

Continents and ocean basins makeup the upper part of the plate.

As the tectonic plate moves the continents and oceans move with it.

The theory of plate tectonics explains the formation,

movement, collision and destruction of Earth's crust.

With this background about plate tectonics, let us

start with the history.

In the early 20th century a young German scientist name

Alfred Wegener noticed that the African and stuff

And South American coastlines on opposite sides of Atlantic

Ocean seem to fit as if they were just adjacent pieces of

jigsaw puzzle.

He realized that the proper fit suggested that the

continent had once been joined together and later separated

from the Atlantic Ocean.

He realized that not only these two continents fit

together, but other continents when more

properly also fit, like additional pieces of some

puzzle.

All the continents together from

one supercontinent. And he named it Pangea.

Pangea is a supercontinent that existed 250 million years ago.

It's a Greek term, which means entire earth or all land.

The northern part of the Pange is commonly called Laurasia.

And the southern part is known as Gondwana.

Wegener knew that the fit of the continent alone will not prove

that a supercontinent existed.

Therefore, he began to collect additional evidences

to support his idea.

He mapped the location of fossils of several species of animals and

Plants that will neither swim nor fly.

Fossils of the same species are now found

in different continents, separated

by thousands of kilometers of ocean.

Then Wegener also plotted the same fossil localities on his Pangea

map. He found that they all lie in the same region of Pangea.

One such example is mesosaurus

This is an ancient reptile that lives only in shallow freshwater.

Fossils of these reptiles are found in only two places.

One is the eastern coast of South America and other is the

western coast of Africa.

Now mesosaurus would not fly.

And there iis very rare possibility that it could swim

for such long distance across

the ocean. So Wegener suggested that they were able to freely

freely walk across the landmasses that were originally

connected together and later

drifted apart. So that's the evidence number two, we

call it fossil correlation.

The third evidence is related to rock structures.

Wegener noticed several instances in which an uncommon

rock type or sequence of rocks on one side of Atlantic Ocean

was identical to rocks on the

other side. If you look at the mountain range in

Northeastern United State and the Mountain range in the North,

Northern Europe, they match up

 perfectly. They are made up of same types of rock

and same age of rock.

As you can see on this map there we have located this mountain

ranges. So these mountain ranges match up perfectly. They

have the same type of rock and same age of rock.

So this is evidence number 3 that is rock structure correlation.

For evidence number 4 he looked at past climate data.

Certain types of rocks are formed in specific

type of climatic zone.

Glacier deposits are formed in cold climate at higher altitude,

whereas the coal swamps are found in tropical climates.

Thus each of these rocks reflect the latitude at

which they are formed.

He first looked into Glaciers.

Glacier is a huge mass of ice that moves slowly over land and

are restricted in the cold part of the Earth.

These glaciers when they move over the rock, beneath they

forms scratches known as glacial striation, which

you can see in this image.So these are the glacial

striations which are formed due to movement of glacial

On the rock beneath.

If we look at a map, you can find this glacial striations in

tropical rainforest of South America and Africa.

This indicate that these areas were not always tropical in

past. They were once down near the pole where it is cold enough

to have glaciers.

He also noticed thick deposits of salt formation of desert dune

deposit and coal.

These deposits provided additional

Clues that the continents were grouped together in the past.

So these are four evidences which were put forth by Wegner, and

postulated a theory called Continental drift theory.

Wegener's concept of a single supercontinent that

drifted apart to form a modern continent is called as theory of

continental drift and it is supported by four types of

evidence is whether it's matching of continental edges, fossil correlation

Rockstructure correlation and

paleoclimate which is also known as past climate.

But this theory of Wagener was not accepted as he could not

explain the mechanism behind the drifting of the continent.

He was not able to explain how continents move or why

did the continents drift.

Now this is later explained in a theory called plate tectonic

theory, thank you.