



# 101 Questions & Answers OUR PLANET'S PHENOMENAL PAST

The quickest way to increase your Green Quotient



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## A note from Dr R K Pachauri

Human society has reached a stage of prosperity, which was not expected several decades ago. Yet, a large number of people live in poverty and are barely able to keep alive. It appears that they have not been touched by human progress at all. At the same time, what we regard as progress has resulted in damage and destruction of our natural resources and caused serious problems such as human-induced climate change, which threaten all forms of life in different parts of the world in the form of sea-level rise, heatwaves, floods, droughts, and melting of glaciers.

All of this provides a strong reason for us to re-examine what we have mistakenly believed as human progress and change the way we have been pursuing human activities. For instance, we must now use renewable sources of energy and eco-friendly methods of production and consumption, make efficient use of water in every activity, and protect biodiversity.

It is in the hands of the children to try to change their own lives towards greater protection of the environment and all our natural resources. They can also take active part in changing the thinking of adults. Children can take the lead in organizing actions, which support conservation of resources, recycling of waste water, and greater use of renewable sources of energy, at the community level.

This series of children's books is aimed at providing children with knowledge on what needs to be done in all these areas. I hope those who read these books will not only enjoy them greatly but also inspired to implement actions that are described in these pages, so that we create a beautiful, peaceful, and healthy future for the human race.

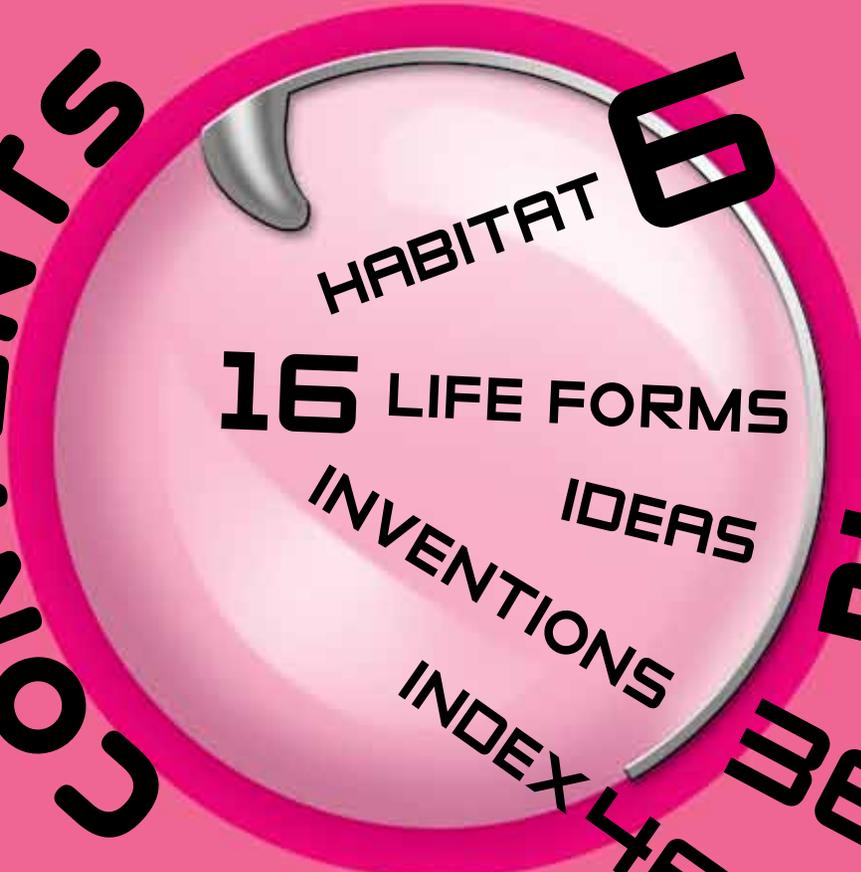


R K Pachauri

Director-General, TERI

Chairman, Intergovernmental Panel on Climate Change

# CONTENTS



**6**

HABITAT

**16** LIFE FORMS

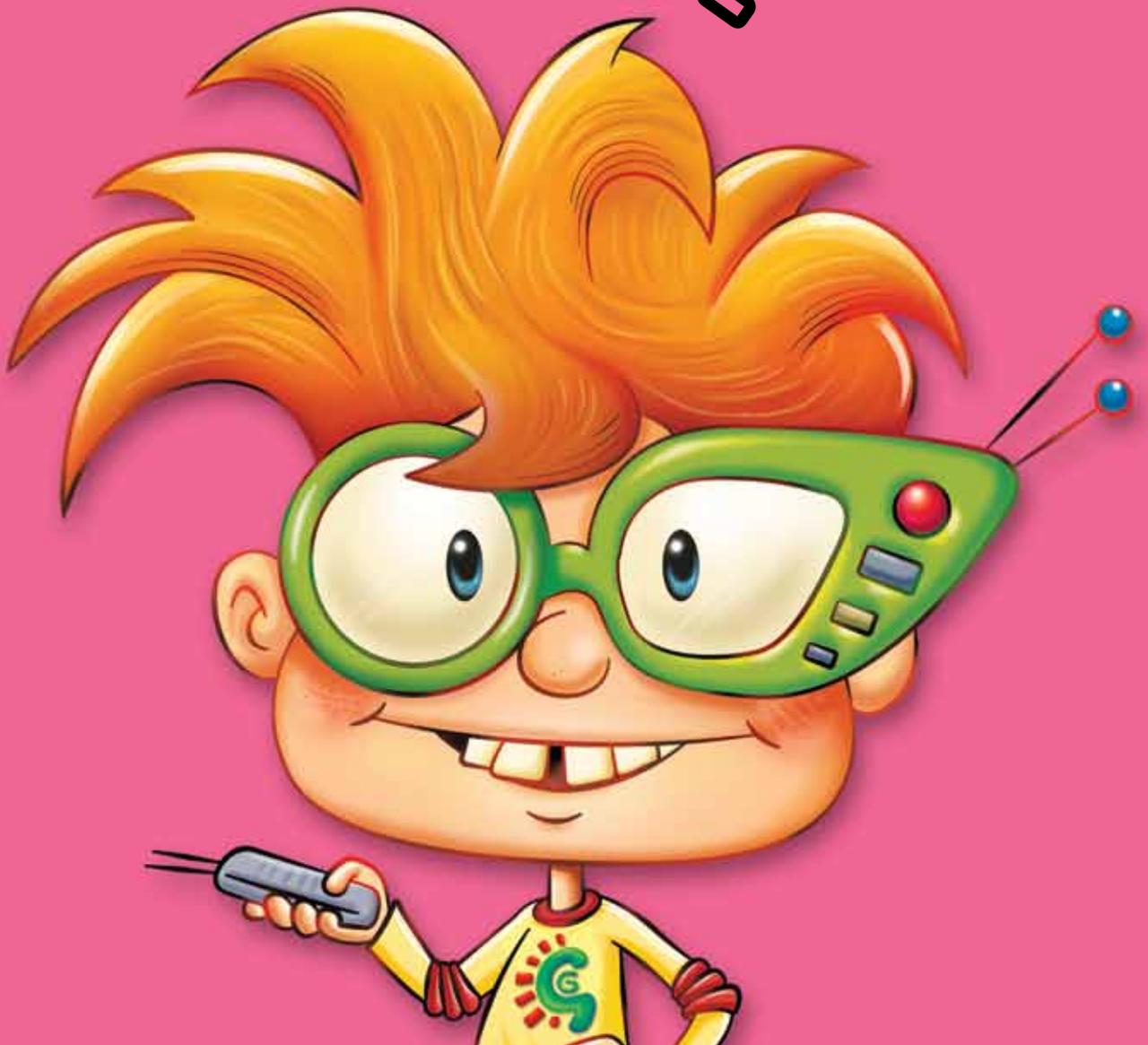
IDEAS

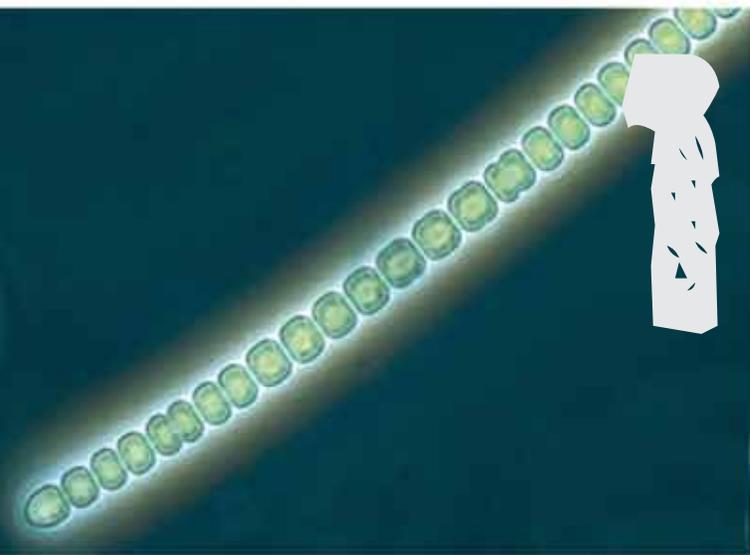
INVENTIONS

INDEX **46**

**26**

**36**



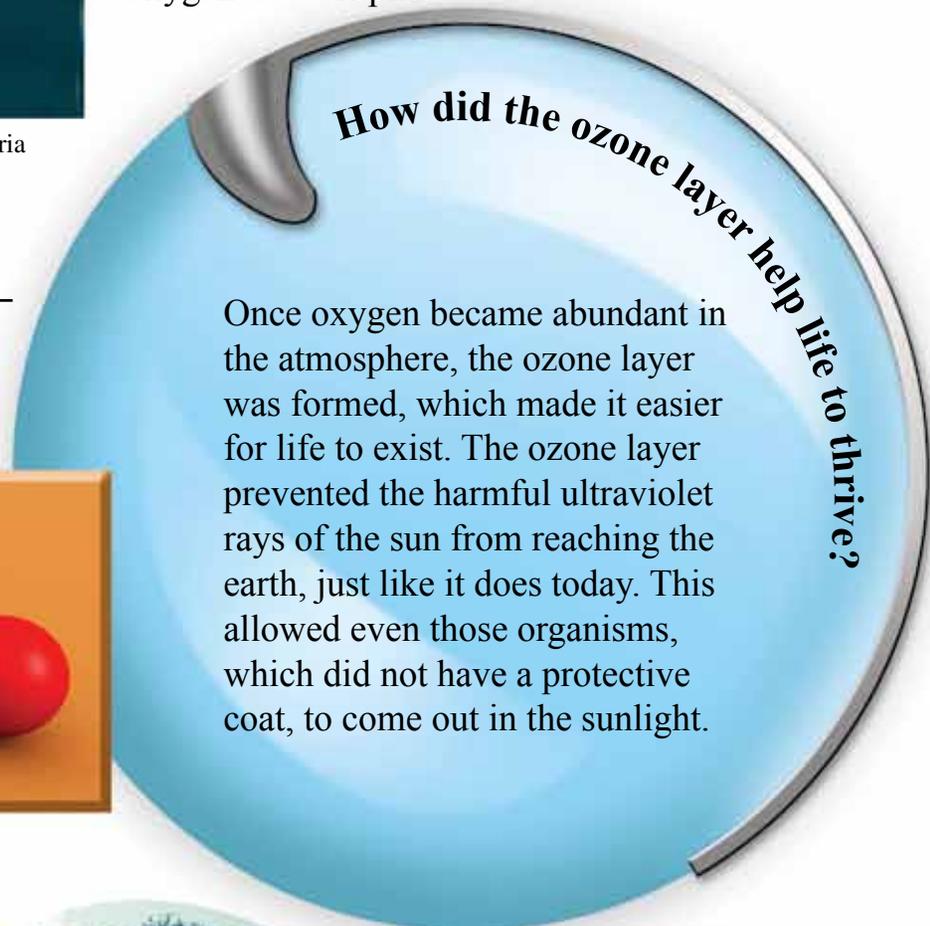
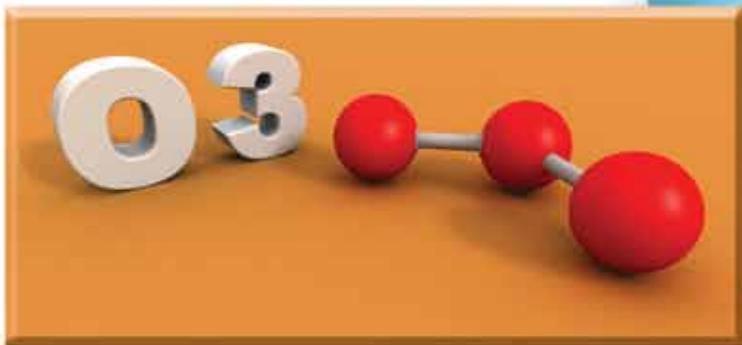


Blue-green algae, or cyanobacteria

## Was there ever life without oxygen?

Life on the earth came much before oxygen. About 2.5 billion years ago, there was no oxygen in the air! Then, evolving life forms like the blue-green algae initiated photosynthesis. During the process, they released oxygen into the atmosphere, changing it. This change killed most organisms on the earth. This event was called the Oxygen Catastrophe.

2



Once oxygen became abundant in the atmosphere, the ozone layer was formed, which made it easier for life to exist. The ozone layer prevented the harmful ultraviolet rays of the sun from reaching the earth, just like it does today. This allowed even those organisms, which did not have a protective coat, to come out in the sunlight.

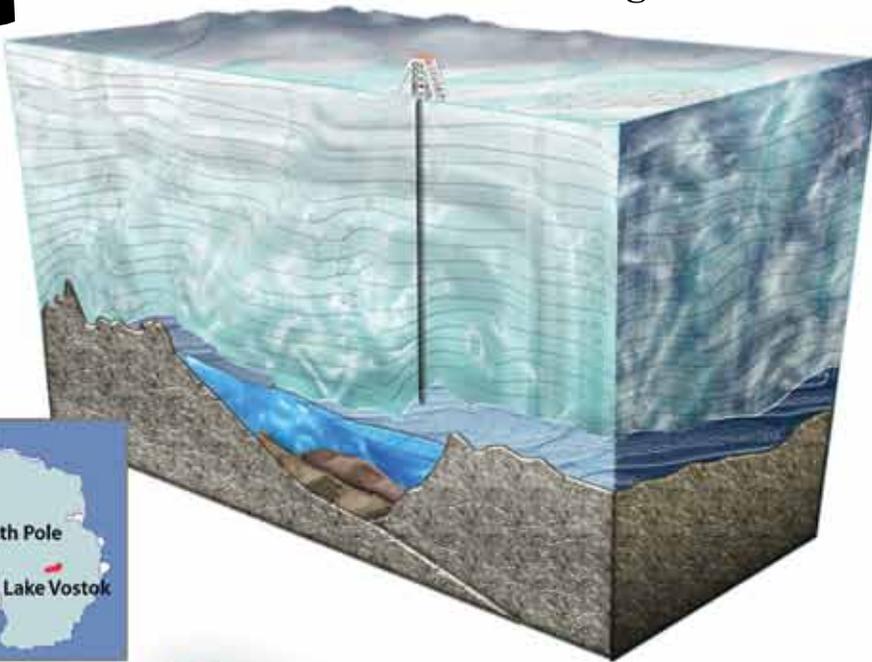
## Which period in history is called 'Snowball Earth'?

About eight hundred million years ago, the earth was hit by a massive ice age. This period is called 'Snowball Earth'. Some scientists believe that the entire surface of the earth was frozen. If this were to occur now, humans would be able to ski right from the North Pole to the South Pole!



# 4

Where is the largest subglacial lake in the world located?



Lake Vostok is the largest subglacial lake. It is found under the surface of Antarctica. The lake contains plenty of liquid water under the thick ice cap. The average temperature of water in this lake is around minus three degrees Celsius. The water remains liquid below the normal freezing point!

**What did the earth look like 1.1 billion years ago?**

About 1.1 billion years ago, all the land mass was joined together to form one huge supercontinent, Rodinia. This land mass split into two continents about 750 million years ago.

# 5



# 5

## When was the supercontinent Pangaea formed?

The land masses that were formed after the break up of Rodinia gradually began to reassemble about 250 million years ago. They again formed a supercontinent called Pangaea. This was the dominant land mass on the earth for about 100 million years.

## How did plant life grow and develop?

About 417 to 354 million years ago, the climate was warm. As a result, plant life grew. Ferns and trees began to cover the land. Plants developed special tissues called vascular bundles for carrying water and nutrients to their branching parts. Seeds also began to be formed.



## 8



### How was coal formed?

The Carboniferous period – 354 to 290 million years ago – was marked by the formation of coal. In fact, most of the fossil fuels that we use today were formed in this period.

## 9



### What impact did the Carboniferous Ice Age have on the planet?

About 354 to 290 million years ago, the earth went through the great Carboniferous Ice Age. Great sheets of ice accumulated, melted, and then accumulated again. Vast glaciers up to 2.5 kilometres thick were formed at the South Pole.

## 10

### When did the rule of mighty dinosaurs begin?

The Jurassic period began about 205 to 140 million years ago. It was named after the Jura Mountains located between France and Switzerland. This was the time of the mighty dinosaurs, which ruled the earth for almost 135 million years!



## How did the continents on which we live today emerge?

During the Jurassic period, the continent of Pangaea broke up. The continent was divided into two subcontinents, which were separated by the Tethys Sea. This arrangement continued for millions of years and finally formed the continents we inhabit today.



### In which period were the Rocky Mountains and the European Alps formed?

About 135 to 115 million years ago, there was a period of rapid volcanic activity and high continental plate movement. This period was known as the mid-Cretaceous period. It was in this period that mountain ranges such as the Rocky Mountains and the European Alps were formed.



# 12

# Green Genius's 101 Questions and Answers : Our Planet's Phenomenal Past



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