



## CHAPTER 7

# EARTH'S ATMOSPHERE

Skye returned from school and placed her bag on the desk. As she was about to crash into bed, she heard a creak. Was there an <sup>25</sup>*intruder* in her room?

**"BOOO!"** a voice shouted from behind her. Skye bravely turned around and punched the intruder in the face. "Ow!" Felix cried in pain and clutched his nose.



Skye rushed to her friend's help. "Felix! It is you! I thought it was some intruder. I am so sorry for hurting you."

It was not just Felix in Skye's room. Orak, Verum, and Scorch tumbled out of her closet and waved at her.

"We wanted to surprise you after school. It was Felix's idea," Scorch was quick to blame the little pixie.

Skye hugged the Mysticals and said, "I love this surprise!" Then she sighed. Verum realised that something was wrong.

"Did you have a bad day at school?" Verum asked.

The five of them sat in Skye's tent. Skye told her friends what happened at school. "Today, the teacher taught us about the Earth's atmosphere. She explained the different layers of the Earth's atmosphere, but I did not understand it well. And now I have to write a project on the subject," Skye sighed again.

"Is that all? I know everything about the Earth's atmosphere and its layers. I will be your teacher today. Let us go in my Tempus Machine," Orak said.

"Okay, Orak teacher," Skye giggled.



## What is the atmosphere?

The atmosphere is like a big blanket of air that surrounds the Earth. It protects us and keeps our planet just right for all living things to survive. It keeps us warm and gives us <sup>26</sup>oxygen to breathe.

“Are you ready to explore the Earth’s atmosphere?!” Orak shouted over the sound of the Tempus Machine’s engine. He flew up and up!

“The atmosphere is made up of different layers. Each layer has special <sup>27</sup>features,” Orak began.

The Earth has a unique atmosphere that supports life. No other planet or moon in our solar system has an atmosphere like Earth’s.



### 1. Troposphere

The first layer is called **Troposphere**. We live on the Earth’s surface. The troposphere is the closest layer to the Earth’s surface. It goes up to about 7 to 20 kilometres above the Earth’s surface. All weather, such as rain, snow, wind, and clouds, occurs in this layer. We need oxygen to breathe. The air in this layer is the thickest and has the most oxygen.



A diagram of Earth's atmosphere showing concentric layers. The Earth is on the left, with clouds and a small airplane. Four curved arrows point from the text boxes to their respective layers: the Stratosphere, Mesosphere, Thermosphere, and the Auroras section.

## 2. Stratosphere

This layer is above the troposphere. It goes from about 20 to 50 kilometres above the Earth's surface. The stratosphere contains the ozone layer. The ozone layer protects us from the Sun's harmful rays. The stratosphere has a small amount of weather. It is calm. This is why, jets and aeroplanes fly in this layer.

## 3. Mesosphere

This layer is above the stratosphere. It goes from about 50 to 85 kilometres above the Earth's surface. The mesosphere is the coldest layer of the atmosphere. It is the layer where meteors burn up. Sometimes, rocks from outer space enter the Earth's atmosphere. They burn up and create a bright trail of light called meteors. We call them shooting stars.

## 4. Thermosphere

This layer is above the mesosphere. It goes from about 85 to 600 kilometres above the Earth's surface. The thermosphere is very hot because it absorbs a lot of the Sun's energy. This is also where the auroras (northern and southern lights) occur. The International Space Station (ISS) orbits in this layer.



The beautiful lights in the night sky near the North Pole and the South Pole are called auroras. They occur when the Sun's

<sup>28</sup>particles interact with the thermosphere.





## 5. Exosphere

This is the outermost layer of the atmosphere. It goes from about 600 to 10,000 kilometres above the Earth's surface. The air is very thin here. This layer gradually fades into outer space.<sup>29</sup> Satellites orbit in this layer.

"Wow, the Earth's atmosphere and the layers are so beautiful. I understand everything now. Thank you, Orak," Skye said.

"You are welcome, Skye. But it is sad to see humans harm this beautiful atmosphere, especially the ozone layer, with their actions. Maybe you can write a project on that," Orak suggested.

"That is a great idea, Orak!" Skye said. "Thank you, all of you, for making my day." Skye hugged the Mysticals and waved them goodbye. After the Mysticals left, Skye began her project.

## HOW CAN WE HELP EARTH'S ATMOSPHERE?

The ozone layer is a special layer high up in the sky that protects us from the Sun's strong rays. It is found way up in the sky, in a part of the atmosphere called the stratosphere. The ozone layer is like a blanket that wraps around the Earth. It is not something we can see, but it is there, doing its job to protect us from the Sun's harmful rays. It is like Earth's sunscreen!

When the ozone layer becomes thinner or forms holes, more harmful rays from the Sun reach the Earth's surface. This can cause many problems:

**Health problems:** More people can suffer from skin cancer and eye damage.

**Environmental damage:** Too many harmful rays can affect plants and animals.

**Marine life damage:** The increased harmful rays can affect plankton, the tiny organisms at the bottom of the marine food chain. They are an important food source for fish and other marine animals.

### How can we help?

We must change our habits to protect the ozone layer. Here are some ways we can help:

#### Avoid products with CFCs:

Use products that say "ozone-friendly" or "CFC-free". Chlorofluorocarbons or CFCs are chemicals that were once commonly used in refrigerators, air conditioners, and spray cans. When CFCs are released into the air, they reach the ozone layer and break down the ozone molecules. This creates holes in the ozone layer.

#### Reduce, reuse, recycle:

We must reduce the number of things we buy and the amount of waste we produce. We must reuse things instead of throwing them away. We must recycle products and use them again.



1. How do holes develop in the ozone layer?

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2. Write down what you do at home or in school to be a Planet Warrior.

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3. Have you ever thought what would happen if the troposphere ceases to exist and we start to run out of oxygen? What would happen to animals and plants? What do we need oxygen for?

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4. Give reasons: Newspapers say that more people are suffering from eye damage and skin cancer.

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5. What would life be like if we did not have the ozone layer? Is it an important part of Earth's atmosphere?

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- HOW TO BECOME -

# GUARDIANS OF THE WORLD

## CLIMATE ACTION



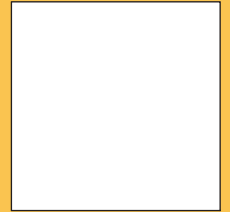
The Sustainable Development Goal 13 is about taking care of the environment and fighting climate change. It is a mission to help our beautiful Planet Earth. Every time we drive a car or use air conditioning, a lot of harmful gases are released into the Earth's atmosphere. These gases damage the atmosphere and the ozone layer. But do not worry- all of our actions together can make a big difference.

Are you ready to become a Guardian of the World? Let us stop these harmful gases from reaching the atmosphere.



### STORYTIME

**The Mystical  
Bewitching  
Earth Hour**



Cast a magical spell to save Earth. On Saturday night, mutter this spell and switch off all the lights, televisions, fans, air conditioners, chargers, and other electrical appliances for an hour.

Earthy worthy warrior norrior, ✨  
Sunlight water rainbow shinier  
Dark witchy flower power  
Mission Mystical Bewitching Earth Hour ✨

Did I turn off the electricity for one hour? Tick your answers in the boxes below.

#### WEEK 1

☐

Yes

☐

No

#### WEEK 2

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Yes

☐

No

#### WEEK 3

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Yes

☐

No

#### WEEK 4

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Yes

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No