FOCUS

FACTS ON CLIMATE CHANGE UNRAVELLED FOR STUDENTS

TEACHERS' HANDBOOK

CAG
Citizen consumer and civic Action Group

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Note to Teachers

This material is written and designed to help young learners understand climate change and sensitise them to the changes that are happening in the world. This book has eight units with simplified and engaging content that will help students understand these concepts with ease.

Stages of Lesson

Each unit is based on six recognised stages for teaching a lesson - Warm Up, Presentation, Practice, Application, Extension and Reflection.

Warm Up: This helps get the learners interested in the topic of the lesson. This can also be used to activate prior knowledge of the learners.

Presentation: This is an area where information is presented to the learner. Each subtopic in a unit is considered a presentation stage. Therefore, there can be more than one presentation in each lesson.

Practice: Class discussions and exercises that will help the learner practice concepts learnt will be part of this section.

Application: Activities that help learners apply the concepts they have learnt will be part of this section.

Extension: Ways in which learners can take the learning beyond the classroom will be included in this. Research and exploration are an integral part of this section.

Reflection: In this section, learners get to write down their own thoughts about what they learnt and how they feel about something.

Lesson Plans for all units

The lesson plan includes stages of the lesson and many suggested activities. Teachers could use the same or change the *activity depending on the students' level and interest. It is requested that teachers do not change the content of the book.*

Every lesson is planned to last for one hour and additional 45 mins - an hour per lesson are extension activities that learners will work on their own. Kindly ensure students complete the activities as and when the units are completed.

The portions marked in bold indicate the extension activities that learners will work on their own.

The work from activities marked with a camera symbol (🖿) need to be photographed and shared with us. Photos of the work of 5 randomly chosen students will suffice.

At the end of each unit, please make sure that the teacher's reflection questionnaire is filled in and submitted to us.

UNIT 1
Weather and climate

Unit 1: Weather and Climate

Learning outcomes

By the end of the lesson, learners will be able to

- Describe & differentiate weather and climate
- Define & differentiate global warming and climate change
- Recognize and demonstrate understanding of the greenhouse effect

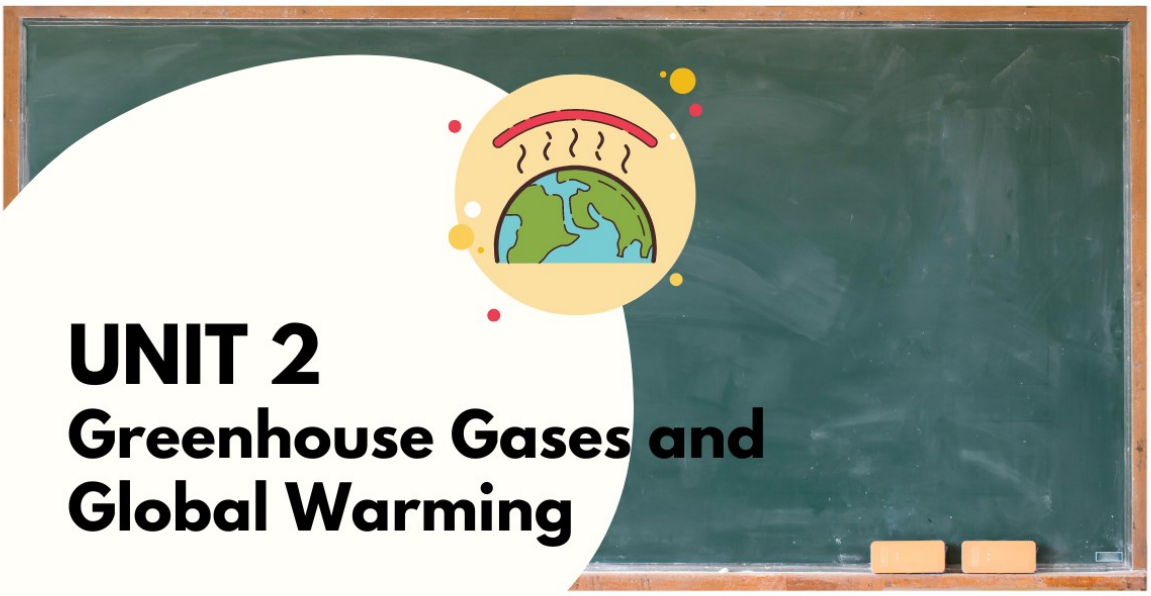
Stage	**Topics**	**Time**	**Remarks**
Warm Up	Comic and questions Students read the comic strip; teacher asks questions and engages in a discussion to activate prior knowledge.	10 mins	
Presentation 1	Ss are made to work in pairs, they read the content aloud. weather and climate and discuss. They examine the world map and talk about different climate zones T explains scientific illustration 2.	20 mins	
Practice	T asks questions to verify understanding about weather and climate	5 mins	
Application and Extension	**Activity 1.1 and 1.2**	**15 mins**	**Assigned as home-work**
Presentation 2	T draws attention to illustration 2 and initiates discussion. T uses the KWL chart (Activity 1.3 ■) to make students write what they already know about global warming. Reading Activity Video watching- Ss fill in the KWL chart once they have watched the video	30 mins	T asks Ss to scan the passage for in-formation about names of green-house gas, once they find it, Ss are asked to read the passage. T also engages Ss in a discussion regarding the video.
Practice 2	Ss complete Activity 1.4	10 mins	
Presentation 3	T explains scientific illustration 3, elicits answers from the students.	20 mins	

Stage	Topics	Time	Remarks
Practice 3	Ss complete Activity 1.5, 1.6 - T discusses answers	25 mins	
Practice 4	**Ss complete Activity 1.7 at home**		
Reflec-tion	**T asks the Ss to write down what they learnt from the lesson.**	**15 mins**	**Homework**

CHECKLIST:

 Taken photographs of key activities

 Filled up post-survey questionnaire



UNIT 2
Greenhouse Gases and Global Warming

Unit 2- Greenhouse gases and global warming

Learning Outcomes

By the end of the unit, students will be able to

- Explain the relationship between the greenhouse effect and global warming.
- Describe greenhouse gases and their effects on the environment
- Predict human actions that contribute to climate change.

Stage	Topics	Time	Remarks
Warm Up	T writes FOSSIL FUELS on the board and asks students what they know about fossil fuels.	10 mins	
Presentation 1	T draws attention to Scientific illustration 1. T asks concept checking questions How are fossil fuels formed? Are fossil fuels found only under the ground? Or are they found underwater too? In case there is a provision for AV, T can play the video or Ss read the text in pairs and share what they understand. T clarifies what happens when fossil fuels are burnt. T explains scientific illustration 2.	20 min	
Practice	T asks concept checking questions for the scientific illustration and then Ss work on Activity 2.1 🖿 . T explains how to do activity 2.2	15 mins	
Application & Extension	**Activity 2.2: Research on news reports, from the last 7 years, about extreme climatic events - cyclones, floods, heat waves, snow storms, drought etc. Make a list of 10 such events in the following table**	**30 mins**	**Ss complete research on their own and fill in the data**

Stage	Topics	Time	Remarks
Warm Up 2	T may use one of the games to introduce the next topic. 1. Write GREENHOUSE GASES jumbled and ask Ss to find out 2. Write down each letter from the word on chits; ask each student to take one and then bring them together to form the word. (T may have some plain chits to make the game more interesting. 3. A dumb charade to find the word- One volunteer can be given the word and others find out. 4. Use a pictionary variant of the same	15 mins	T may come up with a new game apart from ones in the list. T will have to prepare prior to class for the games.
Presentation	T divides the class into four groups, each group reads about one of the greenhouse gases. They share their understanding with the class. After the class discussion, T explains scientific illustration 3 Ss work on Activity 2.3	20 mins	T may ask students to pick up chits to choose the greenhouse gas the group will read about T is a facilitator and helps with difficulty in understanding.
Application & Extension	T explains the activity 2.4- Ss conduct a class survey to talk to 4 of their group members to collect data on the electrical appliances they use everyday at home. After Ss complete the data. T explains the use of quantifiers– everyone, most of, some, no one. T asks Ss to interpret their data using quantifiers	40 mins	For ease of the activity, the T may use the previous grouping done
Reflection	**T initiates Ss into the next topic of human's contribution to Climate change. Ss reflect and work on Activity 2.5** **Ss also complete their unit reflections along with Activity 2.5**	**30 mins**	**This activity is reflection oriented**

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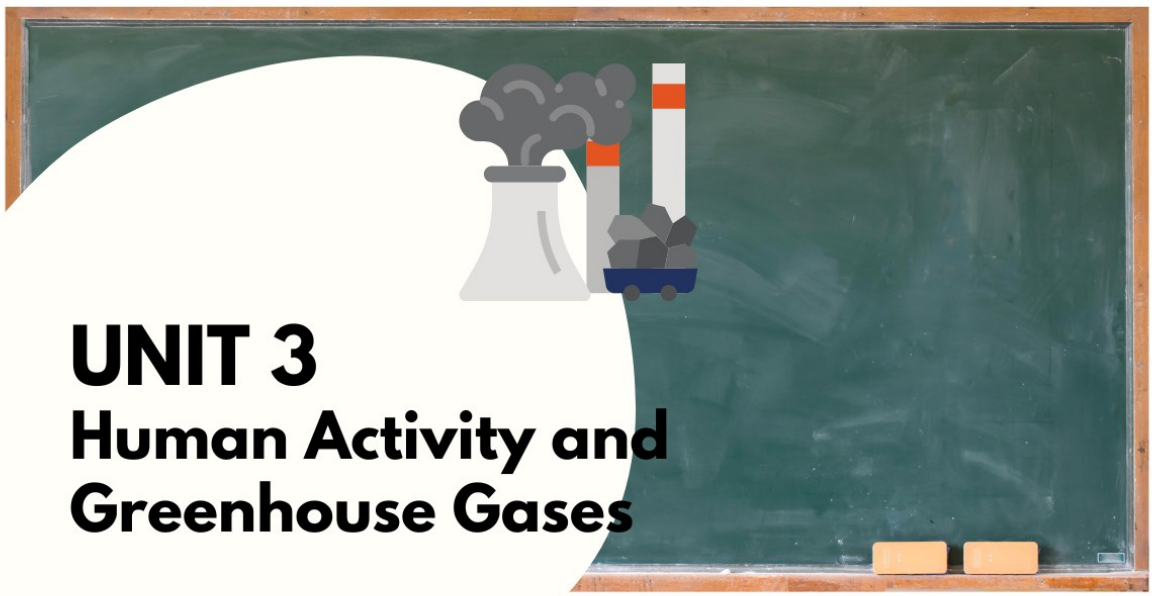

UNIT 3
Human Activity and Greenhouse Gases

Unit 3 Human Activity and Greenhouse Gases

Learning Outcomes

By the end of the unit students will

- Describe ways in which humans contribute to climate change.
- Critically examine the link between human actions and climate change .
- Devise an action plan on steps to reduce the impact of climate change.

Stage	Topic	Time	Remarks
Warm up	T starts with a vote on the topic - Are individual humans contributing to climate change? T takes opinions from 2 or 3 students	10 mins	
Presentation	T divides the class into 6 groups. Each group is given a topic from the text book to read up and work on. Ss read the text from the book on the topic allotted to them and write down their points for the question- Is this true? They are free to make points for the answer Yes and No Ss then share what they have learnt and present both sides of the arguments. Other groups take notes on what is presented.	40 mins	This class is a task based lesson, therefore setting the task is important. The following steps could be followed to set the task -Divide Ss into groups - Assign one topic to each group - Ask Ss to first read the text on the topic. Ss will then discuss if the situation is true or not, for example, the group that reads about Electricity Generation can discuss their answer to the question- Is this true? Ss may feel yes Electricity generation increases greenhouse gas emission because They may also have an opinion that electricity generation is not the biggest contributor. -Ask the groups to write down arguments for both Yes and No.

Stage	Topics	Time	Remarks
Practice	Ss then write down their arguments for activity 3.2 Once they have written all arguments, students engage in a debate speaking for and against.	30 mins	
Application & Extension	T takes students through Activity 3.1,3.2 & 3.3 and 3.1 and 3.2 is completed in class and 3.4 is assigned as homework	20 mins	
Reflection	**Activity 3.4** 🗀 **& Unit reflections**	**30 mins**	

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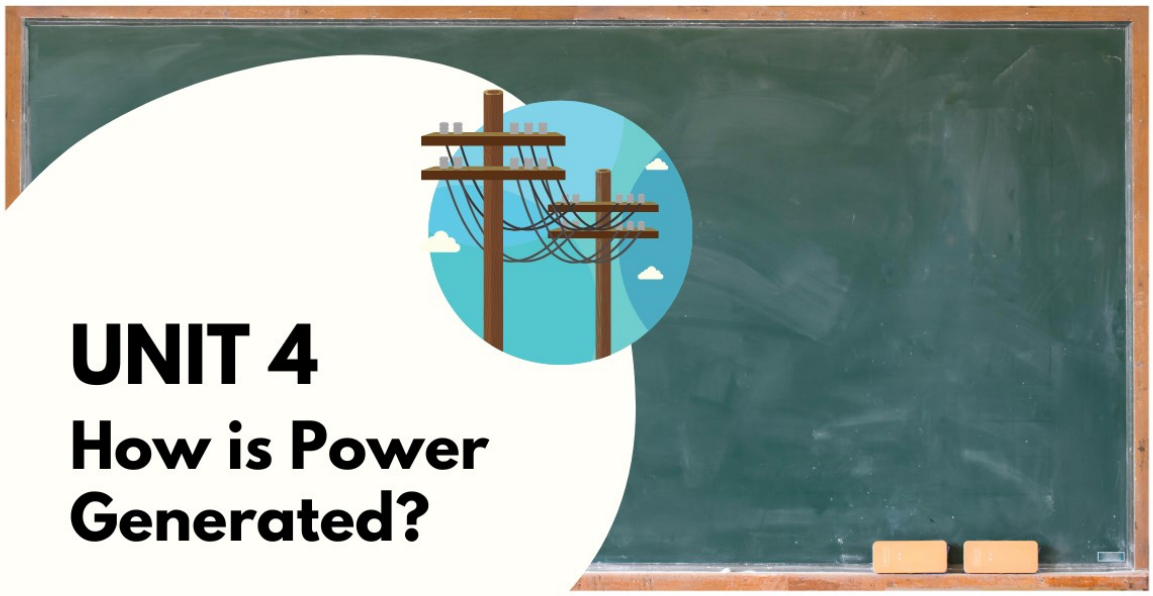

UNIT 4

How is Power Generated?

Unit 4: How is power generated?

Learning Outcomes

By the end of the unit students will

- Differentiate renewable and non-renewable resources
- Describe the process of power generation from fossil fuels
- Explain why renewable energy sources are better

Stage	**Topics**	**Time**	**Remarks**
Warm Up	T asks the Ss- Do you know where the power for your house comes from? T initiates discussion among the students T draws S attention to the statistics in the unit.	10 mins	
Presentation 1	T takes Ss through the text about coal and its impact on human health	25 mins	
Practice	Activity 4.1- T checks understanding using this activity	10 mins	
Application & Extension	**Activity 4.2- Ss research on their own and find out about countries that use coal**	**30 mins**	
Presentation 2	T draws attention to the Scientific illustration 2 and asks them to name the sources they can identify T then divides the class into groups and asks each group to think of why it is more beneficial to use renewable resources (students are encouraged to think on their own and not see the books)	15 mins	
Practice	Ss present their views about the advantages in class and T sums up points adding points in the book Ss complete activity 4.3 🗀 Ss answer question in section 2 about solar panels, on their own. Ss are divided into pairs; they use both their work together and use their reasons to use re-newable resources at home, to perform a role play- one S takes the role of child and the other, the parent .	30 mins	

Stage	Topics	Time	Remarks
Application & Extension	**Activity 4.4 Poster making**	**15 min**	
Reflection	**Unit Reflection**	**15 min**	

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UNIT 5

How does Global Warming cause Climate Change?

Unit 5: How does global warming cause climate change?

Learning Outcomes

By the end of the unit students will

- Describe how global warming leads to climate change
- Identity, examine and describe the impact of climate change on the ecosystem
- Identify and describe instances of climate change events around them

Stage	Topic	Time	Remarks
Warm Up	T uses the following video of the Ice experiment to start the class T can alternately use the items mentioned in the video and conduct a demo too. T discusses the observations and then introduces the topic of the unit.	15 mins	(1643) Why Melting Glaciers Matter to the Coasts - YouTube
Presentation	Ss work in groups to read on each topic and make notes. They write down their points on pieces of paper/charts and stick them on different corners. Each group goes around the class to read notes made by others and make their observations (This is called a gallery walk)	30 mins	This class is a task based lesson, therefore setting the task is important. The following steps could be followed to set the task -Divide Ss into groups - Assign one topic to each group - Ask Ss to first read the text on the topic.
Practice	T asks Ss to share their observations from the gallery walk. Ss complete activity 5.1, 5.3 - T conducts this as a discussion and helps Ss complete the task Ss bounce off ideas in pairs for activity 5.5 🗀 (story about bees)	30 mins	

Stage	Topic	Time	Remarks
Application & Extension	**Activity 5.2; 5.4 are completed outside the class** **Each student submits their version of the story of bees going on strike**	**45 mins**	
Reflection	**Unit reflection**	**15 mins**	

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UNIT 6

Effects of Climate Change on Humans

Unit 6: Effects of climate change on humans

Learning Outcomes

By the end of the unit students will

- Describe climate change induced impact on physical and mental health
- Identify vulnerable populations that can be worst affected by climate change
- Define climate justice

Stage	**Topics**	**Time**	**Remarks**
Warm Up	T asks Ss to share experiences during the COVID pandemic- How life changed for you? What do you know about the problems faced by people?	10 mins	
Presentation	T uses the KWL chart format to connect each extreme weather event to how things change for humans T elicits from Ss and documents their answers on the board.	20 mins	
Practice	Ss are divided into groups and they read the content in the text-book and work on Activity 6.2	20 mins	
Application & Extension	The same groups are asked to discuss the topic - Does climate change affect all people the same way? Ss then share their thoughts with the class	20 mins	
Practice	**Ss read the content about cli-mate justice and complete Activity 6.3**	**15 mins**	
Reflection	**Unit reflection**	**15 mins**	

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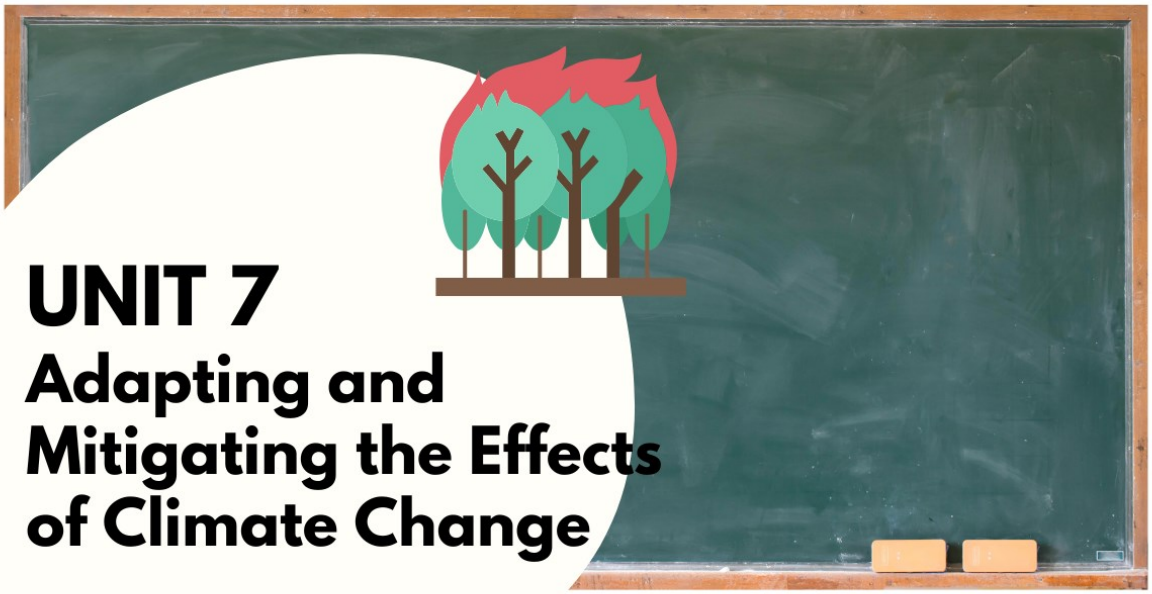

UNIT 7

Adapting and Mitigating the Effects of Climate Change

Unit 7: Adapting to and mitigating the effects of climate change

Learning Outcomes

By the end of the unit students will

- Describe the meaning of adapting to climate change
- Describe the meaning of mitigation of climate change
- Examine and evaluate the methods which can be used to mitigate and adapt

Stage	Topics	Time	Remarks
Warm Up	T draws attention to the General illustration in the unit and asks students the following questions: What is the situation? What do you see people doing? Why are they moving from one place to another?	10 mins	
Presentation	T divides the class into smaller groups and each group is given a problem, they have to come up with solutions to the problem List of problems The city has run out of fuels for vehicles and cannot supply any more to the people. What can people start doing? There has been no rain at all, so there is a severe shortage. What can people start doing to deal with the situation? The temperature in Summer is becoming higher and higher, so what can people do to protect themselves? Each group comes up with a list of solutions of what they can do now and how they can protect themselves in future and the discuss in class T then explain the difference between adaptation and mitigation from their discussion.	30 mins	
Practice	Ss complete activity 7.1	20 mins	

Stage	Topics	Time	Remarks
Application & Extension	T takes Ss through the rest of the lesson Ss complete activities 7.2, 7.3 , 7.4	30 mins	For activity 7.4 students can discuss a personal disaster management plan with their partners. This discussion is different from the first activity suggested for the activity. This is their own personal list.
Reflection	**Unit reflection**	**30 mins**	

CHECKLIST:

- Taken photographs of key activities
- Filled up post-survey questionnaire
- Instruct Ss to bring their art supplies like colours, sketch pens to the class next week for the 3 Rs poster

UNIT 8

From Anxiety to Empowerment

Unit 8: From Anxiety to Empowerment

Learning Outcomes

By the end of the unit students will

- Describe climate change denial
- Inspect and explain why people deny climate change
- Analyse and devise a plan on how students can help tackle climate change

Stage	**Topics**	**Time**	**Remarks**
Warm Up	T starts the class with the question Is climate change real?	5-7 mins	
Presentation	T introduces Climate denial, T draws the graphic organiser on board and uses a mind map to talk about each climate denial type Ss spend time reading the comic strips	20 mins	
Practice	Ss complete 8.1	10 mins	
Presentation	T explains about various steps that Ss can take for a sustainable way of living	15 mins	
Practice	Ss complete 8.2	15 mins	Could be done as homework in case of time constraint
Application & Extension	Ss make their own poster for the Rs T gives instructions on making the poster	30 mins	Title for the poster to be put in the top - centre; tagline is a set of words; draw images that are relevant.
Reflection	Classroom feedback	10 mins	
Practice	**Activity 8.3 is completed outside class**	**20 mins**	
Reflection	**Unit reflection**	**15 mins**	

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