sazaniassociates

Sazani Trust

Teaching Guide 14

Climate change

Healthy and Sustainable Schools Programme 2nd Edition

Preface

The Healthy and Sustainable Schools Programme is a result of Sazani Associates UK and Sazani Trust Zanzibar's ongoing partnership with the Ministry of Education to improve the quality of education and learning in Zanzibar.

The project is aligned with the Sustainable Development Goals and actively supports teachers and schools in achieving Global Education Target 4.7.

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development (UNSD, 2021).

Focusing on the combined importance of key skills and healthy and sustainable life skills, we have revised and updated our series of fifteen Teaching Guides to support competency based curriculum linked learning.

The teaching materials are suitable for use in the last two years of primary across the transition to the first two years of secondary school.

There are fifteen Teaching Guides in this series, themed around topics that contribute to healthy and sustainable life styles within the context of Zanzibar, as follows:

1. Why we need to eat well
2. Getting enough food
3. Keeping food safe and clean
4. Population and health
5. Water
6. Sanitation and waste
7. Tourism
8. Biodiversity
9. Agriculture
10. Fisheries and marine resources
11. Energy
12. Land transport
13. Land use
14. Climate change
15. Participatory action learning

Each Teaching Guide is themed and contextualized to bring Zanzibar and contrasting localities into a classroom setting and to make learning engaging and relevant to local livelihoods. Activities are gender responsive, participatory and proven to support numeracy, literacy, English language and critical thinking.

For more information please visit our website **www.sazani.org**

Acknowledgements

This series of fifteen Teaching Guides has been adapted from Sazani Associates HSSP topic books by Rajab S. Ali, Safia M. Abdalla, Mwanawije M. Makame, Patrick Rutledge, Nicola Shone, Joshua Shawe and Rashid O. Shehe, with editorial review by Marilyn James and Dr Cathryn MacCallum. Graphic design and layout by Seven Six Design.

Contents

1 Introduction

The learning content and activities in this Teaching Guide have been designed to be easily integrated across the curriculum. Throughout the resource, knowledge, skills, attitudes, and values are interlinked and are built into all the topic areas addressed.

We have revised and updated our series of fifteen Teaching Guides to support competency-based, curriculum linked learning and development by focusing on the combined importance of key skills including numeracy, literacy, critical thinking and English language for healthy and sustainable lifestyles. The teaching materials are suitable for use in the last two years of primary across the transition to the first two years of secondary school.

There are different methods of displaying this information, through text, tables, diagrams, images and activities. Each activity includes icons to illustrate which curriculum area and which key skills are used as summarised in the tables below.

Key skills				
Numeracy	Literacy	Critical thinking	English language	Creativity
				

Activity / STD V-VI	Maths	English	ICT	Civics	Geography	History	Science	Religion	Arabic
Match the definition	X	X	X	X	X	X	X	X	X
Climate change relay		X	X	X	X	X	X	X	
Shrinking islands				X	X	X	X		
Rising sea level in Zanzibar				X	X	X	X		
Acting out global warming		X		X	X	X	X	X	
The greenhouse game					X		X		
Human action cards ranking		X			X		X		
Mangrove debate		X		X	X	X	X		

Activity / Form 1-2	Maths	English	ICT	Civics	Geography	History	Biology	Chemistry	Physics	Religion	Arabic
Match the definition	X	X	X	X	X	X	X	X	X	X	X
Climate change relay		X	X	X	X	X	X	X	X	X	
Shrinking islands				X	X	X	X	X	X		
Rising sea level in Zanzibar				X	X	X	X				
Acting out global warming		X	X	X	X	X	X	X	X	X	
The greenhouse game					X		X				
Human action cards ranking		X			X		X				
Mangrove debate		X			X	X	X	X	X		

2 Topic overview

Key words

Climate: the average measurements of temperature, wind, humidity, snow, and rain in a place over the years. Climate is like the weather but over a long time.

Landfill: a system of garbage and trash disposal in which waste is buried between layers of earth.

Radiation: energy that moves from one place to another. Light, sound, heat, and X-rays are examples of radiation.

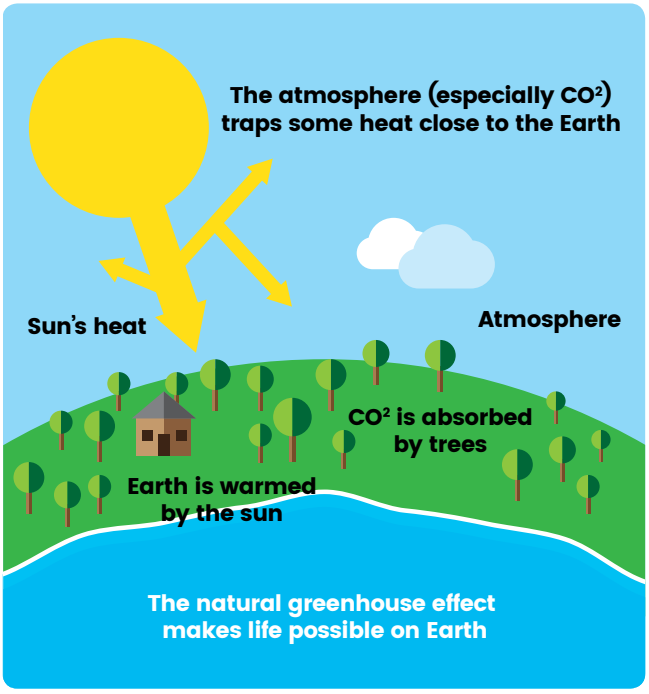
Deforestation: the cutting down of forests or groups of trees which is then turned into non-forest use. These are usually converted to farms, ranches, or used for urban use. But it is happening more and more, and having a bad impact on our environment and climate change.

Climate change describes a change in the average conditions – such as temperature and rainfall – in a region over a long period of time. Climate change or global warming, is the process of our planet heating up. The earth has warmed and cooled many times. Regulating the earth's temperature is very important for the maintenance of life. Climate change refers to all forms of climatic inconsistency, implying significant long term abnormal fluctuations in temperature, precipitation, wind systems and other forms of the earth's systems. This regulation occurs mainly through the atmosphere (the "blanket" of gases such as oxygen and nitrogen that surrounds the earth). The most important gas in the atmosphere for regulating temperature is carbon dioxide.

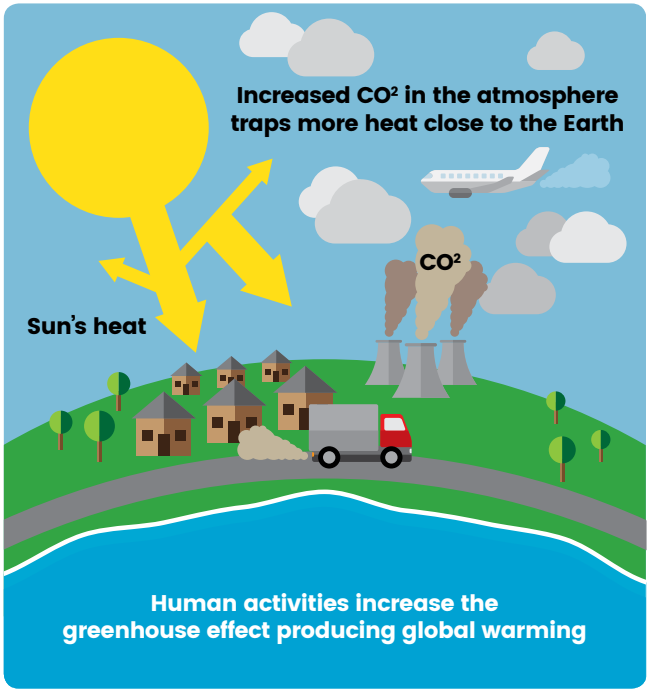
Much of the sun's heat passes through the earth's atmosphere and warms the planet. Some of the heat rebounds back into space but some of the heat energy is trapped by carbon dioxide in the atmosphere, and this trapped heat warms the planet. This is known as the greenhouse effect and contributes to global warming, a general increase in the planet's average temperature.

2.1 Effects of global warming

Temperature rises cause ice caps to melt, which increases the sea level; this will have devastating consequences for low-lying countries, particularly islands. For example, Zanzibar, which is at risk of being submerged in water.



The atmosphere (especially CO2) traps some heat close to the Earth.



Increased CO2 in the atmosphere traps more heat close to the Earth

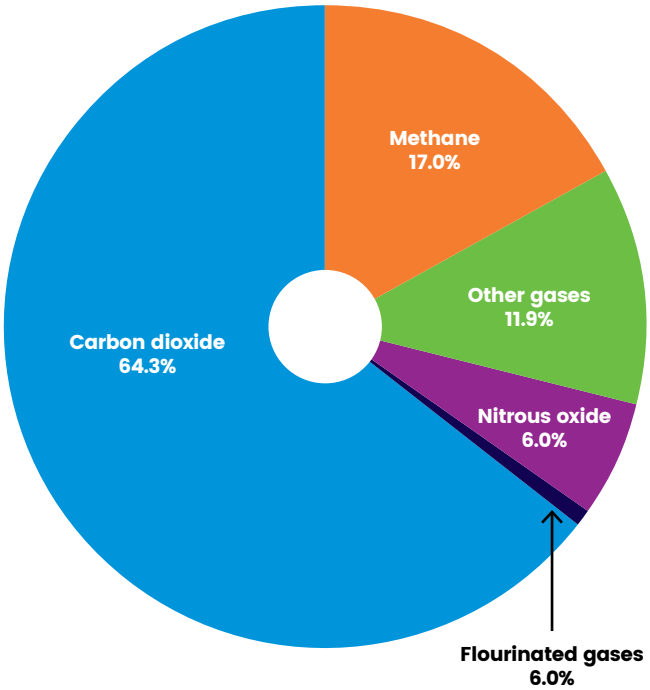
Humans have also been engaging in deforestation – the cutting down trees in forests – to make space for agricultural production and industry. Trees are essential to combat climate change as they absorb the harmful carbon dioxide from the environment whilst releasing oxygen.

Deforestation has taken place in many parts of the world, including the world's largest rainforest, the Amazon rainforest in Brazil. Zanzibar is no exception, where some people resort to cutting down mangrove trees to use the land for agricultural expansion.

2.2 Types of greenhouse gases

- **Carbon dioxide** – mainly produced by burning fossil fuels; plants can absorb it, so forest removal means that less is absorbed from the atmosphere.
- **Methane** – produced by some farming practices (e.g. rice cultivation and cattle rearing), coal mining and rotting waste. It is also released during fuel and wood burning, and when using fertilisers.
- **Chlorofluorocarbons (CFCs)** – used in refrigerators, aerosols, air-conditioners and foam packaging. Many countries have reduced the use of CFCs because they also damage the upper atmosphere's ozone level.
- **Low-level Ozone** – formed when strong sunlight reacts with air pollution.

Major greenhouse gases from people's activities



2.3 Causes of climate change

Natural causes	Attitudes and values
Orbital changes – the Earth has natural warming and cooling periods caused by variations in the tilt and / or orbit of the Earth around the Sun (wobble, roll and stretch theory).	**Burning fossil fuels,** e.g. coal, gas and oil – these release carbon dioxide into the atmosphere.
Volcanic activity – during a volcanic eruption carbon dioxide is released into the atmosphere.	**Deforestation** – trees absorb carbon dioxide during photosynthesis. If they are cut down, there will be higher amounts of carbon dioxide in the atmosphere.
Solar output – there can be fluctuations in the amount of radiation from the sun. If there is a high amount emitted there will be an increase in Earth's temperatures.	**Dumping waste in landfill** – when the waste decomposes it produces methane.
	Agriculture – agricultural practices lead to the release of nitrogen oxides into the atmosphere.

2.4 Effects of climate change

Climate change has an impact on all the other themes discussed in this Teaching Guides series. Climate change is the most important environmental problem facing us in the 21st century. The effects of climate change are already being experienced around the world and include:

- Natural disasters such as storms, drought and landslides are becoming more frequent, with strong winds and heavy rain.
- Unpredictable climate: rainy seasons have become less predictable and extreme temperatures have become more common.
- Sea-level rise will affect 80 million people causing flooding to houses and farmland.
- Tropical storms will increase in magnitude (strength).
- Water shortages.
- Species in affected areas (e.g. Arctic) may become extinct.
- Diseases such as malaria increase, an additional 280 million people may be affected.
- A decline in farm production in developing countries .

What happens to the weather in one part of the world affects the weather in other parts because all share the atmosphere. Developing countries, especially low-lying island countries such as Zanzibar, face the biggest challenge in addressing climate change because sea levels rises can potentially submerge all of Zanzibar's islands underwater!

3 Changes in the weather

Key words

Coral bleaching: when water is too warm, corals will expel the algae (zooxanthellae) living in their tissues causing the coral to turn completely white.

El Niño-Southern Oscillation (ENSO) weather cycle: is an irregular periodic variation in winds and sea surface temperatures over the tropical eastern Pacific Ocean, affecting the climate of much of the tropics and subtropics. The warming phase of the sea temperature is known as El Niño and the cooling phase as La Niña.

Carbon footprint: the amount of CO2 released into the atmosphere because of one's own energy needs.

Developing country: are countries with economies that have a low gross domestic product (GDP) per capita.

Developed country or Industrialised country: is a country that has more businesses and infrastructures (roads, airports, electricity, etc) than a developing country.

Humidity: is the amount of water vapor in the air. If there is a lot of water vapor in the air, the humidity will be high.

Air temperatures are increasing and so are sea temperatures, even though they vary from place to place and year to year. Our weather depends on the interactions between the atmosphere, land masses and the oceans. The processes which give rise to weather are very complex, so it is difficult for scientists to predict precisely what will happen and how fast it will happen.

3.1 Climate seasons of Zanzibar

In Zanzibar, there is always some natural variation in our weather from one year to the next. Zanzibar has four distinct seasons, two dry seasons (one short and one long) and two wet seasons (one short and one long).

Dry seasons:

- The **short dry season with warm temperature (kusi)** falls between January and February, which is a popular period for tourism. The temperature is high at around 29°C and humid.
- The **long "cold" dry season (kaskazi)** lasts from June to October. There may be brief, light showers, but the weather is mainly sunny.

Rainy seasons:

- The long rainy season or **Monsoon season (masika)** is between March and May. This is the time when the islands experience heavy rainfall that can last for days. It is also very humid.
- The **short-wet season (kipupwe)** falls between November and December. Rain showers are often short and quickly replaced by the sun during this period.

Box 1. Is this fair?

Industrialised and developed countries such as China, South Africa and the USA are the largest greenhouse gas contributors. Yet developing countries are the most impacted by climate change and are the least able to afford its consequences. For example, the average carbon footprint for a person in the United States is 19.78 tons per year, compared with 0.12 tons per year for a Tanzanian.

The effects of climate change are especially serious for low-lying small island states such as Tuvalu (in the Pacific Ocean), Zanzibar and the Maldives, and low-lying developing countries such as Bangladesh. Developing countries will find it challenging to deal with climate change due to a lack of funding, technology and expertise. Other island countries, such as the Seychelles, are more fortunate because they have some higher land, even if the total land area is small. According to the World Health Organization, as of the year 2030, climate change is expected to contribute to approximately 250,000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress.

3.2 Sea level rises

Higher global temperatures cause ocean water to warm and expand. The polar ice caps and glaciers are also melting faster, resulting in rising sea levels.

For example, in November 2007, there were abnormally high tides in Zanzibar. The tides had been getting higher and higher in previous years, causing increased soil erosion on the coastline. To deal with rising tides and soil erosion, the following coastal defence mechanisms have been used:

- Zanzibar's government has urged people to avoid cutting down trees or building near the coast.
- Concrete walls (Seawalls) of up to 6 feet have been erected along certain parts of the coastline, proving to be a good defence from the sea. However, in some parts of the walls, cracks are emerging.
- People have put up coconut tree poles to protect the coastline from tidal waves.

The sea level has already risen by 10-25cm in the last hundred years. It could rise another 50cm or more by the year 2100; the increase will vary from one part of the world to another.

In 1997 and 1998, the El Niño-Southern Oscillation (ENSO) weather cycle resulted in higher sea temperatures than usual in many tropical regions of the world, this is worrying given that corals are very sensitive to high temperatures and can suffer from "coral bleaching" (see diagram below) and can die. When corals die, they often get covered by algae (seaweed), resulting in a change in the biodiversity (variety of plants and animals) on the coral reef.

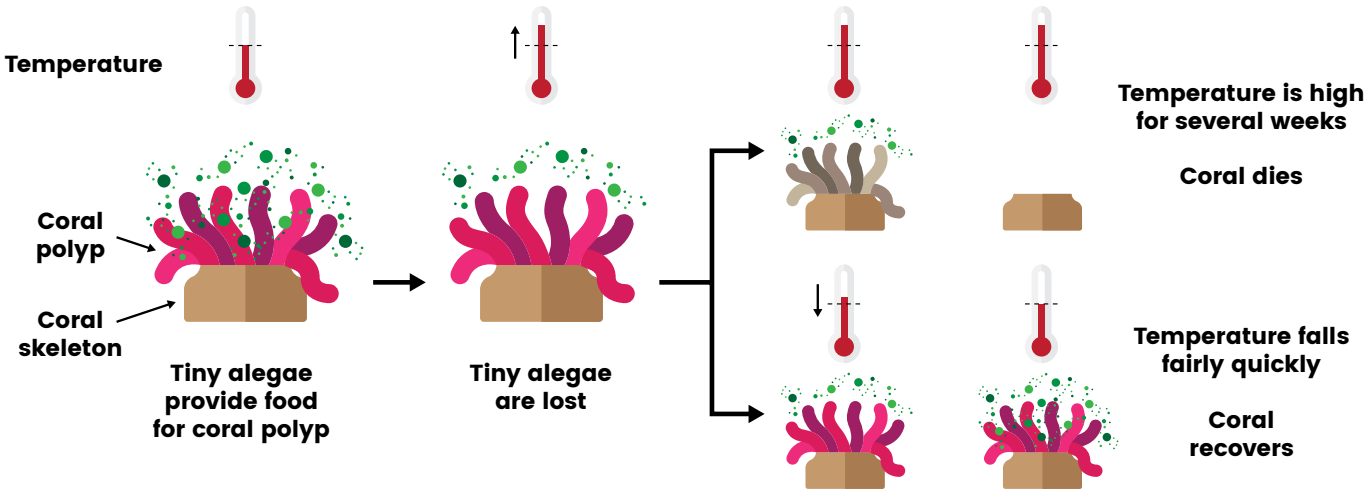


Diagram of coral bleaching.

4 Changes in biodiversity

Climate change is happening faster than people first thought. Endemic plants and animals may not be able to adapt to climate change fast enough, and perhaps some will not survive. More aggressive species may be able to adapt better. It is difficult to predict exactly what will happen, but all natural habitats are at risk, high sea temperatures have already affected corals.

5 Counteracting global warming and greenhouse effects

Key Words

Recycling: is the process of taking materials ready to be thrown away and converting (changing) them into reusable materials. When we do not recycle and reuse, we risk depleting (using up) our natural resources.

Emissions: the production and discharge of something, especially gas or radiation.

Endemic plants and animals: endemism is an ecological word meaning that a plant or animal lives only in a particular location, such as a specific island, habitat type, nation or other defined zone. For example, many species of lemur are endemic to the island of Madagascar.

Climate change is a global problem, and only global action can solve it. International agreements on carbon dioxide levels and other emissions are vital. The countries producing the most emissions must limit them, whilst individuals also realise that their current lifestyles (especially in countries such as the United Kingdom and the USA) are unsustainable and harm the whole world. Every small action can help, so play your part!

- Use alternative energy sources, e.g. geothermal power, solar energy and wind energy.
- Formation of international policies and cooperation among different nations in the fight against pollution.
- Recycling.
- Large scale rice cultivation should be avoided.
- Discourage the use or burning of materials that release harmful greenhouse gases.
- Encourage people to use mass-transit cars instead of individual automobiles to reduce the emission of greenhouse gases.

6 What we have learned:

- Climate change results from increased quantities of carbon dioxide and certain other gases in the atmosphere.
- Human activities are responsible for these increases.
- Climate change is producing extreme weather events, rising sea levels and will cause alterations to biodiversity.
- Climate change is a significant environmental problem currently facing the world. It affects all of us.

Knowledge and skills	Attitudes and values
Understand about climate change and its impacts; share ideas and plan actions; consider the outcomes of climate change and describe / picture them.	Be aware of our responsibility to reduce the causes of climate change; enjoy and learn from educational games.

7 Learning activities

How How How activity

Refer to the **How How How activity** detailed in the "Participatory Action Learning" book to help the student explore different ideas and concepts and challenge each other's points of view.

Activity 1: Match the definition

Resources required:

- Paper
- Pen or pencil
- Sticky tape

Set up:

Copy each term out on to a sheet of paper and stick them to the walls around the room.

Copy each definition out onto a sheet of paper and keep them with the teacher.

Term	Definition
Climate	The average of weather patterns over a long period of time (usually 30 or more years).
Climate Change	Long-term changes in the Earth's climate, or a region on Earth, includes more than just the average surface temperature. For example, variation in the amount of snow, sea levels.
Weather	Atmospheric conditions in the short term, including changes in temperature, humidity, precipitation, cloudiness, brightness, wind and visibility.
Global Warming	An increase in the Earth's average surface temperature from human-made greenhouse gas emissions.
Greenhouse Gases	A chemical compound found in the Earth's atmosphere, such as carbon dioxide, methane, water vapor and other human-made gases. These gases allow solar radiation to enter the atmosphere but then trap the radiation in the atmosphere in the form of heat.
Fossil Fuels	Sources of non-renewable energy. Formed from the remains of living organisms buried millions of years ago. Examples include coal and oil.
Renewable Energy	Energy that comes from naturally replenished resources, such as sunlight, wind, waves and geothermal heat.

Activity:

- Read out each definition, learners must run and touch the term that they believe the definition applies to.
- After learners have made their choice, go around the room and ask learners: Why do you think the definition matches that term?
- Reveal the correct term and hand the learners the correct definition to stick to the wall underneath the term.
- Leave the terms and definitions on the wall after the activity so learners can refer back to them at anytime while covering the topic.

Review:

The following questions or points may be used to review the activity:

- What is the difference between climate and weather?
- Why are fossil fuels considered non-renewable energy? What are some more examples of fossil fuels?

Activity 2: Climate change relay

Resources required:

- Large sheets of paper (1 x per team)
- Pen or pencil

Set up:

Clear a path in the classroom for learners to run or take the activity outside.

Place a big sheet of paper for each team on the far side of the classroom.

Activity:

- Place learners into teams.
- Learners must line up in a single file line at the opposite side of the classroom to their sheet of paper.
- Explain to learners they will have five minutes to come up with ideas for the impacts of climate change as a team. Give learners two examples of "Sea Level Rising" and "Heat Waves".
- Learners will then have 2 minutes to to run up to their sheet one at a time to write down one impact of climate change.
- Learners will then run back to their team and tag the next team member who will repeat the process.
- The winning team is the one with the most correct impacts of climate change written on their sheet at the end of 2 minutes.
- Examples of impacts of climate change include: Heat waves, sea level rising, arctic ice melting, increased ocean acidity, increased flooding, droughts, insect outbreaks, wildfires, reduced agricultural yield, erosion in coastal areas.

Review:

The following questions or points may be used to review the activity:

- Which climate change impacts will most directly effect Zanzibar? Why?
- Is arctic ice melting a concern for Zanzibar? Why?

Activity 3: Shrinking islands

Resources required:

- Chalk or charcoal or rope or carpet (to make islands)

Set up:

Draw or create circles on the ground large enough to fit each team in comfortably.

A carpet or tarp can be used by folding the fabric in to make it smaller.

Activity:

- Place learners into teams, you may wish to use the same teams from the previous activity.
- Explain to learners that the circles represent "islands" and they must attempt to keep all of their team members on their island for as long as possible. However, due to the impacts of climate change the sea level will be rising making their island progressively smaller as time goes on.
- Learners may use any tactics they wish to stay on their island however if even one member of their team puts a foot off the island they have lost. Common tactics include standing on one foot and carrying each other.
- As the activity goes on make the islands progressively smaller and ask learners to consider and answer the following questions:
  - Why is rising sea level a concern for Zanzibar? What impacts could it have on their lives?
  - Why is sea level rising especially threatening to island nations?

Review:

The following questions or points may be used to review the activity:

- What kind of problems will island nations face with rising sea levels?
- Are there any solutions?

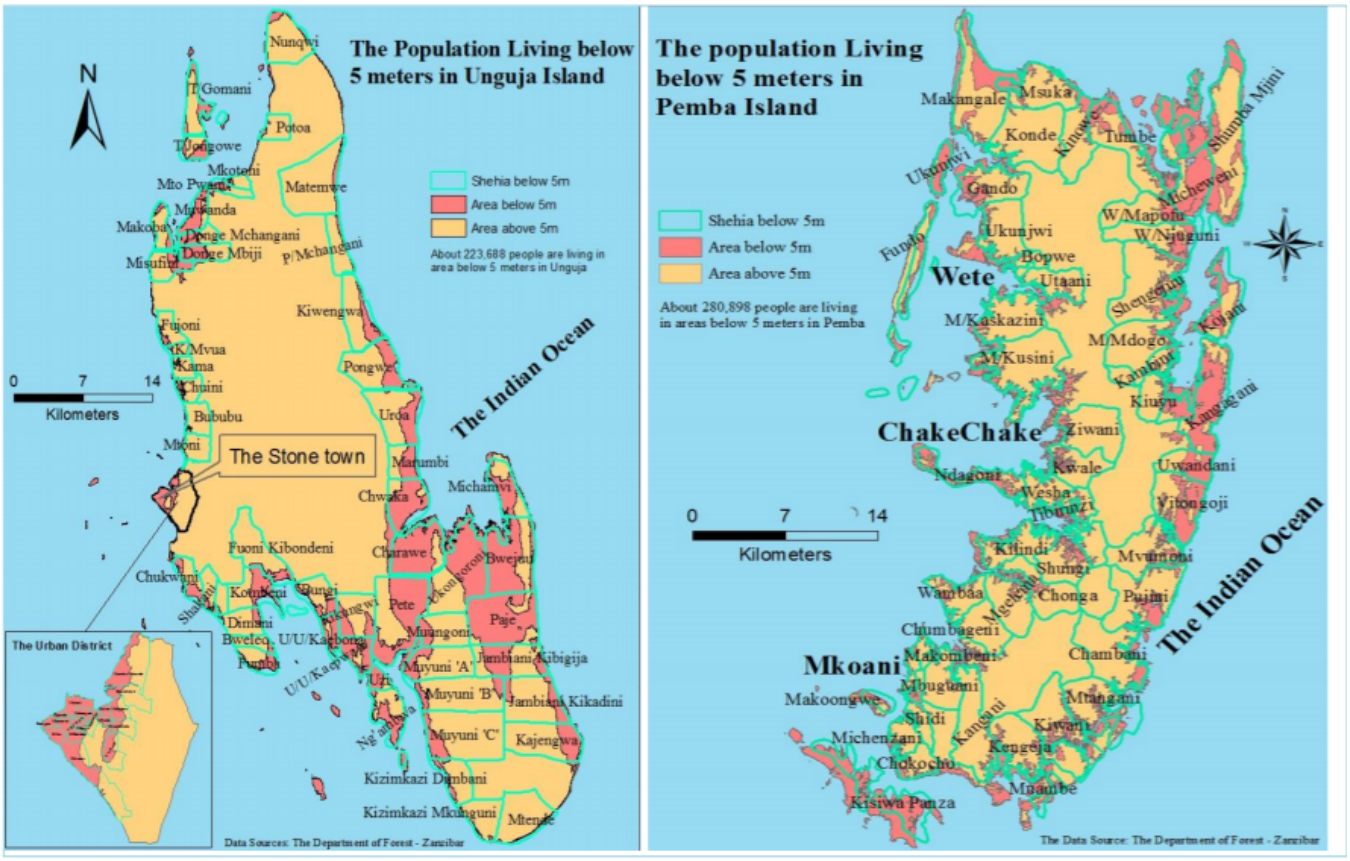
Activity 4: Rising sea level in Zanzibar

Resources required:

- Map of "Zanzibar's population living below 5 meters above sea level"
- Paper
- Pens / pencils

Set up:

Display the map of "Zanzibar's population living below 5 meters above sea level" to the class this could also be done as a rough drawing on the board with the areas under 5m above sea level shaded and the villages marked on.



Villages along the beach fronts

Activity:

- Place learners into pairs or small groups.
- Ask learners to consider the highlighted areas on the map opposite. What would the impacts be to Zanzibar? Ask learners learners to consider the following:
  - Impacts on Tourism
  - Impacts on Agriculture
  - Impacts on Land Use Planning
  - Impacts on Population
- Learners should draw a mind map for each idea and write down as many thoughts as they can within their group.
- Learners can then send representative of their group to look at other groups mind maps to add more ideas.
- Once learners mind maps are complete they can present their ideas to the class and the teacher can draw a mind map of the ideas on the board.

Review:

The following questions or points may be used to review the activity:

- What measures can Zanzibar take to protect its coastal areas?
- Is it important for Zanzibar to plan its land use carefully? Why?

Activity 5: Acting out global warming

Resources required:

- Bin bags or bucket to collect waste and litter

Set up:

Write some examples of human activities that contribute to global warming. Examples include burning of fossil fuels, deforestation and agricultural practices.

Activity:

- Place learners into groups.
- Have learners list as many human activities that contribute to global warming as they can and write each answer on the board with the examples provided.
- Once there is a good selection of answers on the board (at least enough for 1 per group).
- Assign each group one human activity from the board, but ensure the other groups do not know which activity a different group has.
- Inform learners they will need to act out this activity and the other groups will have to guess what the activity is.
- Set a timer and assign each group points for how quickly the other groups could guess their activity e.g. 30 seconds 5 points, 60 seconds 4 points etc.
- If another group guesses correctly they will also receive an additional point.
- Once a group's activity has been correctly guessed, ask learners: How does this human activity contribute to global warming? What could be done differently to reduce its impact?

Review:

The following questions or points may be used to review the activity:

- What can you do to help reduce global warming?
- Is reducing global warming the responsibility of governments or individuals? Why?

Activity 6: The greenhouse game

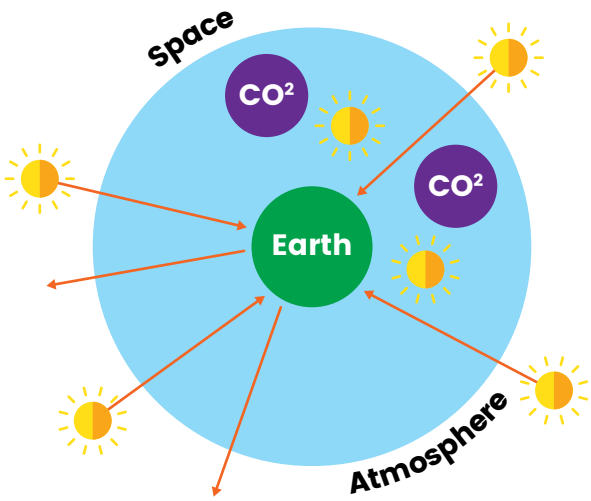
Resources required:

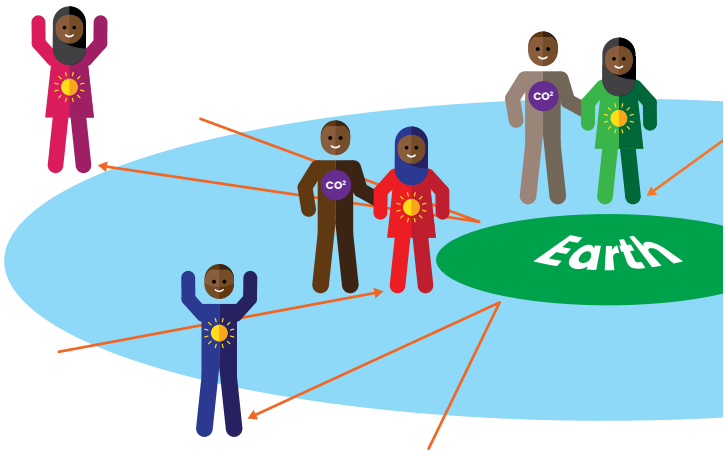
- An open area
- Chalk
- Two pieces of string (30cm and 230cm)
- A small bag with "What are humans doing?" written on it

Set up:

This game demonstrates the greenhouse effect by showing how carbon dioxide in the atmosphere traps some of the sun's heat, insulates the Earth (preventing the movement of heat) and allows life to survive. It also shows what happens when human actions affect the concentration of greenhouse gases in the atmosphere.

Draw a 60cm circle on the ground by holding one end of the 30cm string in one place and using chalk attached to the other end to make the circle. This circle represents the Earth. Draw a larger circle (about 460cm diameter) around it using the longer string. This circle represents the Earth's atmosphere. The game is played in several rounds.





Activity:

CO2 Round 1:

- Two students are CO2 molecules and stand anywhere in the "atmosphere".
- They must not move their feet during the game but can move their arms and hands. The other students are the sun's rays.
- They must try to reach the "Earth" (to touch it with a hand or foot) and then escape through the atmosphere without being touched by a CO2 molecule.
- Rays that are touched by a CO2 molecule must stay standing still in the "atmosphere". Rays must only try to reach Earth once. Each round takes about 30 seconds.
- Rays that have escaped into space then make a circle around the atmosphere.

Interpretation: How many rays have been trapped in the atmosphere by CO2 molecules? This represents the amount of heat energy from the sun that has been trapped in the atmosphere, which is called the greenhouse effect. Discuss how this affects the temperature of Earth. Remember that a certain amount of CO2 is required to keep the planet warm enough to support life.

Round 2: What happens if the amount of CO2 in the atmosphere is increased?

- First of all remove any sun's rays that were trapped in Round 1.
- Use a Human Action card from Activity 7 (which contains only actions which add CO2 molecules).
- Read the card. Add the appropriate number of CO2 molecules to the two that are already in the atmosphere.
- Play the game again and discuss what happens.

Round 3 and following rounds:

- Repeat the game, picking a Human Action card out of the bag, which now contains all of the cards, so the number of CO2 molecules can go up even more, or go down.

Review:

The following questions or points may be used to review the activity:

- The game should illustrate that when the amount of CO2 increases, more of the sun's heat energy gets trapped, and the temperature of the Earth goes up. Burning fossil fuels is one of the main ways humans increase the amount of CO2 in the atmosphere. When human actions reduce the amount of CO2 in the atmosphere, the greenhouse effect is less strong.

Activity 7: Human Action cards ranking

Resources required:

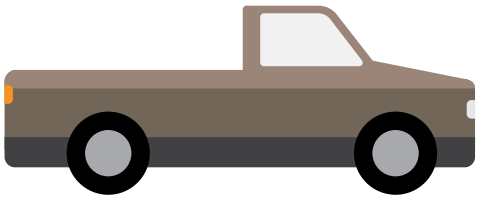
- Human Action cards

Set up:

Write the Human Action cards up on the board or display them so that the whole class can see:

Humans drive cars

Every litre of fuel puts 2.35kg of CO_2 into the atmosphere. There are at least 500 million cars in the world.



(Add two CO_2 molecules)

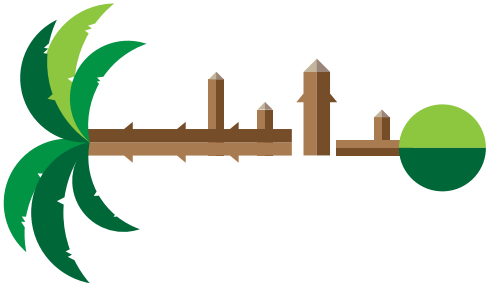
Humans travel in aeroplanes

Aeroplanes produce more CO_2 than cars. More and more people travel by aeroplane.

(Add two CO_2 molecules)

Humans cut down trees

Trees remove CO_2 from the atmosphere during photosynthesis. Fewer trees means more CO_2.



(Add four CO_2 molecules)

Humans burn rubbish

Burning waste puts CO_2 into the atmosphere, along with other pollutants.

(Add two CO_2 molecules)

Human's recycle glass, metal, paper etc.

Recycling saves energy, reducing our use of fossil fuels. This means less CO in the atmosphere.

(Remove two CO2 molecules)

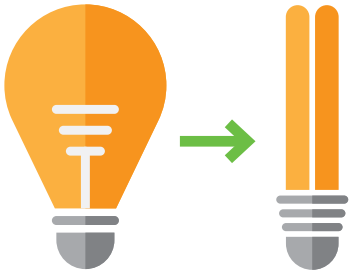
Humans plant trees

Trees remove CO from the atmosphere during photosynthesis. More trees means less CO2.

(Remove four CO2 molecules)

Humans create energy efficient technology

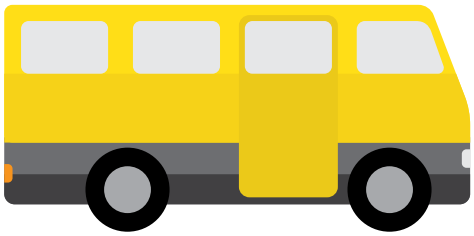
If energy is used more efficiently, less CO is released into the atmosphere.



(Remove four CO2 molecules)

Humans travel by bus not by car

A full bus is more efficient than a car with one or two people in it. This means less CO2 in the atmosphere.



(Remove two CO2 molecules)

Activity:

- Ask learners to look at the Human Action cards.
- Ask learners to consider which actions harm the environment and which actions help the environment.
- Have learners write down two columns and list the human actions that help the environment and those that harm the environment.
- Once learners have written down their two columns ask them to rank the cards 1 – 8 with 1 being the most beneficial to the environment and 8 being the most harmful.
- Ask learners to share their thoughts with their classmates and see if they ranked their cards differently.
- Ask specific learners to share their ideas for ranking and why they chose to rank the cards this way.
- On the board write up the ranking by having learners vote on each card.

Review:

The following questions or points may be used to review the activity:

- Are there any other human actions we can take to help the environment? How could we include this in our daily lives?

Activity 8: Mangrove debate

Resources required:

- Blackboard
- Chalk

Set up:

Write up on the board the positives of maintaining mangrove forests and the reasons they are being cut down on the board.

Positives of maintaining mangrove forests:

- Mangrove forests create a natural barrier between land and sea. They reduce the wave / wind impact from storms and tsunamis.
- They are a safe home to many marine and land animals.
- They are among the most carbon rich forests in the tropics, they take in carbon dioxide and store it in their roots and the soil.

Why cut down mangrove forests?

- Population growth.
- Cutting down trees for wood / charcoal.
- Space for waste management.
- Space for beach side developments.

Activity:

Place learners into an even number of groups and set up several small debates and appoint a judge for each one with the teacher moving around the room.

- Ask each group to split in half, one half will argue in support of cutting down mangroves from the perspective of a local businessman and the other half will argue against cutting down mangrove forests from an environmental perspective.
- Each side should use the reasons given to help frame their arguments but should add their own thoughts.
- Ask learners to follow this structure for the debate:
  - Each side will get to make an opening statement.
  - Each side will then prepare a counter to the opening statement of the other team.
  - Each side will then be able to provide a concluding statement.
- Judges can award 1 point for a good answer, 2 points for an excellent answer and take away 1 point if learners talk over someone.
- After the debate the judge will decide which group won their debate and justify their reasoning.

Review:

The following questions or points may be used to review the activity:

- The teacher can ask the judge of each debate to give a summary of the debate and declare which group won.

Sazani Associates

UK office
Units 1 & 2 Darkgate Buildings
3 Red Street
Carmarthen
SA31 1QL

Zanzibar office
SH/S/C/091
Mombassa Kwa Mchina
P.O. Box 3720
Zanzibar

Tel: **UK: 0044 (0)1267 243576**
Web: **www.sazani.org**
Email: **info@sazaniassociates.org.uk**

UKaid from the British people
COMIC RELIEF
sazaniassociates
Sazani Trust