ZERO WASTE ERASMUS PROJECT
TOOL KIT FOR TEACHERS

SCIENCE LESSON PLAN I

Lesson Theme: Climate Change and Human Impact on Ecosystems

Subject: Science

Level: B2 (CEFR – Language-Integrated Science)

Age Group: 14–17

Lesson Duration: 2×40 minutes

Overall Aim: To develop students' scientific understanding of climate change through data-based reasoning, while enabling them to analyze environmental problems, interpret scientific evidence, and propose realistic solutions using B2-level academic language.

Learning Objectives:

By the end of the lessons, students will be able to:

- explain the scientific causes and effects of climate change,
- interpret temperature data and identify long-term trends,
- link empirical evidence to key environmental science concepts,
- use cause–effect structures, modals, and conditionals accurately,
- design a realistic environmental action plan based on data.

Key Scientific Concepts: Climate change, greenhouse effect, greenhouse gases, carbon footprint, ecosystem balance, biodiversity loss, sustainability

Target Language (B2) Vocabulary: Climate change, emissions, fossil fuels, renewable energy, ecosystem, biodiversity

Structures:

- Cause–effect (because of, due to, results in)

- Modals (must, should, might)

- First conditional (If emissions decrease, ecosystems will recover.)

Materials & Resources

- Global temperature graph (embedded)

- B2-level scientific reading text

- Worksheets (data analysis & reflection)

- Projector / smart board

LESSON 1 (40 minutes)

1. Engagement / Lead-in (10 minutes)

Students observe contrasting images of a healthy and a damaged ecosystem. They discuss visible differences and possible causes in pairs.

2. Concept & Vocabulary Input (10 minutes)

Key scientific terms are introduced with short explanations. Students match concepts with definitions and examples.

Scientific Concepts:

1. Climate Change	5. Carbon Footprint
2. Greenhouse Effect	6. Ecosystem
3. Greenhouse Gases	7. Biodiversity
4. Fossil Fuels	8. Sustainability

Definitions:

A. The long-term change in Earth's average temperature and weather patterns.

B. A system where living organisms interact with each other and their physical environment.

C. Gases in the atmosphere that trap heat and warm the Earth.

D. Fuels such as coal, oil, and natural gas formed from ancient plants and animals.

E. The natural process in which gases trap heat in the atmosphere, keeping the Earth warm.

F. The variety of plant and animal life in a particular habitat or on Earth.

G. The total amount of carbon dioxide released by human activities.

H. Using natural resources in a way that does not harm future generations.

**4. Data Interpretation Task (20 minutes)**
Students work in pairs to analyze a global temperature graph and engage in a guided scientific discussion. The activity progresses from basic data observation to higher-order scientific reasoning and prediction.

Guiding questions:

- What overall trend does the graph show?

- When does the temperature increase become more rapid?

- What human activities may explain this change?

Students analyze the graph and answer the following questions:

1. Describe the overall trend shown in the graph.

2. Identify the period with the most rapid temperature increase.

3. Explain possible human-related causes for this trend.

4. Predict environmental consequences if the trend continues.

5. Suggest one realistic solution to reduce the impact.

Global Average Temperature Change (1880–2020)
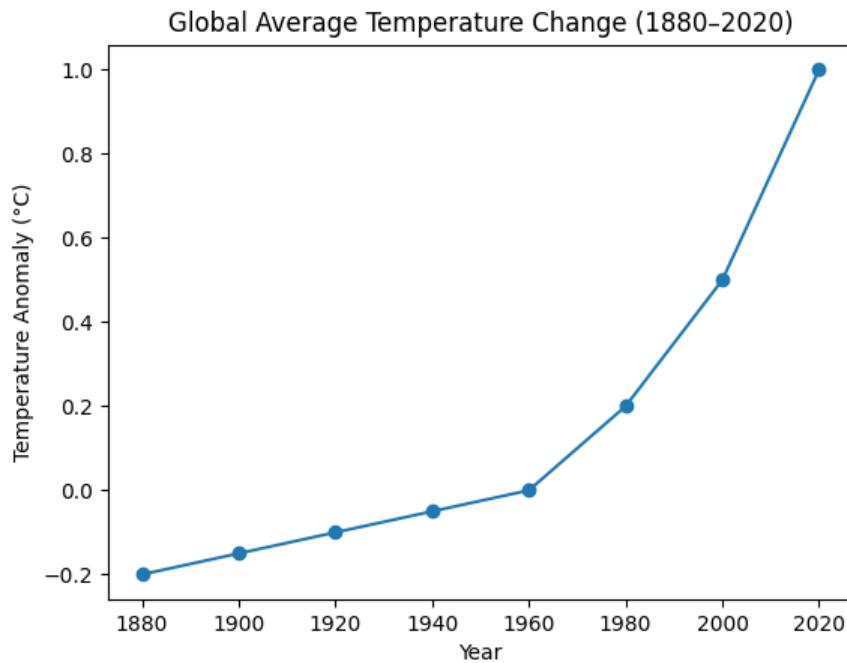
Sentence Completion:

Complete the sentences using scientific language:

- The graph indicates that global temperatures have _____ since _____.

- This trend is mainly due to _____ activities.

- Rising temperatures result in _____.

- If emissions are reduced, climate change might _____.

LESSON 2 (40 minutes)

1. Review & Language Focus (5 minutes)

Students summarize the data using cause–effect sentences. The teacher highlights correct use of modals and conditionals. They identify causes, effects, and possible solutions based on evidence.

2. Scientific Reading (30 minutes)

Step 1 – Pre-reading (5 minutes)

Purpose: Activate scientific background knowledge

Teacher asks: What human activities affect the environment?

What do you know about fossil fuels?

Students answer briefly → teacher writes key words on the board

(fossil fuels, emissions, forests, temperature

Step 2 – While-reading Task 1: Gist Reading (5 minutes)

Task: Students read the text quickly and answer:

What is the main topic of the text?

☐ climate change causes   ☐ renewable energy   ☐ natural disasters

(Expected answer: climate change causes)

Step 3 – While-reading Task 2: Detailed Scientific Understanding (10 minutes)

Students read again and answer in full sentences:

Why does burning fossil fuels increase global temperatures?

How does deforestation contribute to climate change?

What happens to ecosystems when temperatures rise?

Students must use *because / as a result / leads to.*

Step 4 – Post-reading Production (10 minutes)

Students complete: *According to the text, climate change occurs because…*

If human activities continue at the same rate, ecosystems will…

This prepares them directly for the Environmental Action Plan task.

Reading Text:

Climate change is one of the most serious environmental challenges facing the world today. Scientific research shows that the primary cause of climate change is human activity, especially the burning of fossil fuels such as coal, oil, and natural gas. These fuels are widely used for electricity production, transportation, and industrial processes. When fossil fuels are burned, large amounts of greenhouse gases, particularly carbon dioxide, are released into the atmosphere. These gases trap heat from the Sun and prevent it from escaping back into space. This process, known as the greenhouse effect, causes the Earth's average temperature to rise gradually over time.

Deforestation also plays a significant role in climate change. Forests absorb carbon dioxide from the atmosphere, but when trees are cut down, this carbon is released back into the air. As a result, the concentration of greenhouse gases increases even further. Rising global temperatures have serious consequences for natural ecosystems. Many plant and animal species struggle to adapt to rapid environmental changes. Habitats are destroyed, food chains are disrupted, and biodiversity decreases. If this trend continues, ecosystems may lose their ability to function effectively, threatening both wildlife and human life.

3. Production Task: Environmental Action Plan (10 minutes)

Groups create an action plan including:

- one environmental problem,

- two scientifically supported causes,

- two realistic solutions.

Plans are briefly presented to the class.

4. Reflection & Closure (5 minutes)

Students reflect:

- One scientific fact I learned is…

- One action humans must take is…

Assessment (Formative & Performance-Based)

- Accuracy of data interpretation

- Use of scientific terminology

- Logical cause–effect reasoning

- Quality of action plan

Differentiation & Enrichment

- Sentence frames for support

- Extension: local climate issue research

- Mixed-ability grouping

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SCIENCE LESSON PLAN II

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Project Theme: Science - Stop Smog – Easy Science!

Subjects: Physics, Chemistry, Biology

Level: A2 (CEFR)

Age Group: 13-17 years

Duration: 40 minutes

Objectives: By the end of the lessons, students will be able to:

- Students learn what smog is and why it's bad.

- Students name 3 causes and 3 easy fixes.

Materials:

- Phone/projector with air quality photos (smoky vs. clean sky)

- Whiteboard/markers

- Handout with pictures and words

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LESSON (40 minutes)

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1. Start with Pictures (5 minutes)

Goal: See smog problem.

Show photos: Zamość foggy winter day vs. sunny day. Ask class:

- "Is this clean air or smog?"

- "How do you feel in smog?" (Elicit: Cough, eyes hurt.)

Write 3 words: smog, dirty air, smoke.

2. What Makes Smog? (10 minutes)

Goal: Simple science facts.

Draw on board:

- Car → smoke (Physics: exhaust).

- Coal stove → black smoke (Chemistry: burning).

- Factory → grey cloud (Biology: bad for lungs).

Class repeats: "Cars make smog. Coal makes smog."
Quick game: Point to picture – "What causes smog?"

3. Easy Experiment: See Smoke (10 minutes)

Goal: Hands-on fun.

Safe Demo (Teacher only): Light a match or incense for 10 seconds near open window. Fan gently.

- Ask: "See the smoke? Tiny bits go in your nose/lungs."

- No measurements – just watch it spread.

Pairs talk: "Smog like this smoke? Yes/No. Why?"

4. What Can We Do? (15 minutes)

Goal: Easy solutions.

Brainstorm on board (pictures help).

- Walk or bike (no car smoke).

- Wear scarf on bad days.

- Tell family: "No coal today."

- Plant trees (eat dirty air).

Groups of 3: Pick 1 fix. Draw poster (5 mins). Share: "We choose bikes!"

5. Finish Up (5 minutes)

Goal: Remember key ideas.

Class chant: "No cars, no coal, clean air for all!"

Homework: Draw your "No Smog Day" at home/school.

Assessment: Thumbs up if they name 1 cause/fix.

Differentiation: Picture handouts for visuals; repeat phrases often.

Safety: Adult-only flame; good ventilation.

ENGLISH LESSON PLAN I

Lesson Theme: Saving Water/Every Drop Counts

Level: A2 (CEFR)

Age Group: 12–15

Lesson Duration: 2 × 40 minutes

Overall Aim

To raise students' awareness of water scarcity and develop their ability to talk about daily water-use habits and simple solutions using basic English structures.

Learning Objectives (CEFR-aligned)

By the end of the lessons, students will be able to:

- identify common daily activities that require water,
- understand the main idea and key details of a short A2-level text about water problems,
- give advice and simple rules using should / shouldn't and imperatives,
- describe their own water-use habits using short spoken sentences,
- collaborate with peers to create a simple eco-awareness product.

Target Language

Vocabulary: water, tap, shower, sink, toilet, river, clean, dirty, save, waste

Grammar / Functions:

- Simple Present (daily routines and facts)

- should / shouldn't (giving advice)

- Imperatives (giving rules: Turn off the tap.)

Materials & Resources

- Visuals (tap, shower, dry land, polluted river)

- Short adapted A2 reading text

- Board / projector

- Worksheets with sentence starters

- Digital tool (Canva) for poster creation

LESSON 1 (40 minutes)

1. Warm-up / Lead-in (8 minutes)

The teacher asks simple questions:

- Do you use water every day?

- Where do you use water at home?

Students answer orally. The teacher writes key words on the board (e.g., shower, kitchen, toilet).

Purpose: To activate prior knowledge and introduce the topic.

2. Vocabulary Presentation (10 minutes)

The teacher presents key vocabulary using visuals and gestures:

- tap

- shower

- save

- waste

Students repeat chorally and individually. The teacher checks understanding by pointing at visuals and asking students to say the word.

3. Reading – Input (12 minutes)

TEXT:

Water is very important for life. People use water for drinking, cooking, and cleaning.

Some people waste a lot of water every day. In some countries, people do not have enough clean water. We should save water to protect our planet.

Comprehension Questions:

1. Why is water important?

2. Do all people have enough clean water?

3. What should we do?

4. Controlled Practice (10 minutes)

True / False Activity (individual work):

- Water is important for life.

- People never waste water.

- We should save water.

Students check answers in pairs. The teacher gives brief feedback.

LESSON 2 (40 minutes)

1. Review & Activation (5 minutes)

The teacher revises vocabulary from Lesson 1 using quick questions and visuals. Students say words and short sentences.

2. Language Focus: should / shouldn't (10 minutes)

The teacher writes examples on the board:

- We should turn off the tap.

- We shouldn't leave the water running.

Meaning is checked using simple concepts: good idea / bad idea. Students repeat the sentences aloud.

3. Guided Practice (10 minutes)

Sentence Completion Activity (pair work):

- We should _____ water.

- We shouldn't _____ the tap open.

- People should take short _____ .

A word bank is provided. The teacher monitors and supports.

4. Speaking Activity: My Water Habits (10 minutes)

Students work in pairs and ask each other:

- Do you take long showers?

- Do you turn off the tap when you brush your teeth?

Students report using simple sentences: I should... / I shouldn't...

5. Production Task: Eco-Awareness Poster (5 minutes)

In small groups, students create a simple digital poster using Canva.

The poster includes:

- a title (e.g., Save Water!),

- at least two rules using should / shouldn't,

- one simple picture or icon.

Posters can be shared on the classroom wall or digitally.

6. Closure & Reflection (5 minutes)

Students complete the following sentences:

- One thing I should do at home is _____.

- One new word I learned today is _____. The teacher provides brief oral feedback.

Assessment (Formative)

- Observation of participation in pair and group work

- Correct use of target vocabulary and should / shouldn't

- Ability to produce short, meaningful spoken sentences

- Engagement in the poster task

Differentiation & Inclusion

- Sentence starters and word banks for lower-level learners

- Visual support throughout the lesson

- Mixed-ability grouping

- Option to respond with single words or drawings if needed

ENGLISH LESSON PLAN II

Project Theme: Environment & Sustainability

Language Level: B1 (CEFR)

Age Group: 13–16

Lesson Duration: 2 × 40 minutes

Lesson Title: "From Waste to Responsibility: How Our Choices Affect the Planet"

Learning Objectives: By the end of this lesson, students will be able to:

- use key environment-related vocabulary accurately in spoken and written English,

- express opinions and suggestions about environmental problems using modal verbs (*should / shouldn't / must*),

- discuss zero waste practices and recycling habits in everyday life,

- collaborate in groups to design a simple eco-awareness product (poster or slogan),

- develop environmental awareness in line with the Zero Waste project objectives.

Materials & Resources

- Short reading text: *"What Is Zero Waste?"*

- Visuals (recycling symbols, waste types)

- Digital tools: Padlet / Canva / Kahoot

- Real objects: plastic bottle, paper, metal can, reusable bag

- Projector / smart board

Target Vocabulary

Word	Meaning (Simple English)	Visual
recycle	use something again	♻️
waste	things we throw away	🗑️
pollution	damage to nature	
sustainable	good for the planet long-term	🌱
reduce	use less	↓
reuse	use again	🔁

LESSON 1 (40 minutes)

1. Warm-up / Lead-in (10 minutes)

Activity: *Think–Pair–Share*

- Teacher shows 3 real objects (plastic bottle, paper, reusable bottle).

- Students answer:

  o *Which one do you use most?*

  o *Which one is the most harmful to the environment?*

Purpose: Activate background knowledge and connect daily habits to environmental issues.

2. Presentation / Input (15 minutes)

Reading Activity:

Short adapted text: *"What Is Zero Waste?"* https://ecocycle.org/learn-about-zero-waste/what-is-zero-waste/?utm_source=chatgpt.com

While-reading questions:

1. What does "zero waste" mean?

2. Name two examples of zero waste actions.

3. Why is recycling important?

Teacher highlights **modal verbs**:

- *We should recycle paper.*

- *We shouldn't waste water.*

- *People must protect nature.*

3. Practice (20 minutes)
Activity 1: Vocabulary Sorting Task (8 minutes)

Type: Group work (3–4 students)

Materials: Printed cards or board list, *plastic bottle, paper, glass, vegetable oil, battery, metal can, food waste*

Instructions: Students classify the items into three categories: Recyclable / Not Recyclable / Special Waste (needs careful disposal)

- **Follow-up speaking prompts:**

- *Why is vegetable oil special waste?*

- *What happens if we throw batteries into nature?*

- **Language focus:**

- *We should recycle paper.*
  We shouldn't pour vegetable oil into the sink.

Activity 2: Sentence-Building with Modals (7 minutes)

- **Type:** Pair work

- **Instructions:**
  Each pair receives a worksheet with sentence starters:

- *To reduce waste, we should …*

- *People shouldn't … because …*

- *Schools must … to protect the environment.*

- Students complete at least 4 sentences using target vocabulary.

Example student output:

- *Schools must use recycling bins.*

- *We shouldn't waste water because it is limited.*

- Teacher monitors and corrects **form + meaning**.

Activity 3: Problem–Solution Role Cards (10 minutes)

    Type: Group speaking task

    Role Cards (example):

- *Your school uses too much plastic in the cafeteria.*

- *Students waste a lot of paper in class.*

- *Used vegetable oil is poured into sinks at home.*

    Task:
    Groups discuss:

- What is the problem?

- Why is it harmful?

- What **should / shouldn't / must** be done?

- Each group prepares one short oral solution.

    Reporting back:

    One student per group shares: *Our problem is… We think students should…*

4. Production / Creative Output (20 minutes)

Creative Task (Project-based):

Groups choose ONE:

- Design a Zero Waste Poster (Canva / paper)

- Create 3 eco-campaign slogans e.g. *"Small actions, big changes."*

Outputs can be:

- displayed at school,

- shared on the Erasmus project platform or eTwinning.

5. Closure / Feedback (5 minutes)

Reflection questions:

- *What new word did you learn today?*

- *One thing I can do for the environment is…*

Optional: **Kahoot quiz** (5 questions) to revise vocabulary.

Assessment (Formative)

- Observation of participation in discussions

- Correct use of target vocabulary and modal verbs

- Group collaboration during the creative task

- Short oral feedback from peers

Adaptations & Differentiation (SEN / Inclusive Approach)

- Visual support and simplified instructions

- Mixed-ability grouping, option to contribute visually instead of verbally

- Sentence starters provided (*I think…, We should…*)

MATHS LESSON PLAN I

Project Theme: Environment & Sustainability

Lesson Title: Crush It for Zero Waste!

Level: B1 (CEFR)

Suggested Age Group: 13–17 years

Duration: 40 minutes

Objectives:

- Students will describe the bottle-crushing experiment and its results using numbers and comparatives.

- Students will discuss benefits of crushing waste and use zero-waste vocabulary.

Key Language: Comparatives (smaller, less space), numbers/results (6-9 times), vocabulary (crush, volume, recycle, space-saving).

Materials:

- Photos/videos of the experiment (from groups' work)

- Whiteboard for volumes/math

- Handout with experiment steps and discussion prompts

- Small props: empty bottles/cartons (optional demo)

LESSON (40 minutes)

1. Warm-Up and Review (5 minutes)

Goal: Recall the experiment and activate vocabulary.

Show photos of groups filling boxes with uncrushed vs. crushed bottles/cartons. Ask: "What did we do last time? Why crush bottles?" Elicit: "To save space!" Introduce/review words: crush, volume, space-saving.

Quick poll: "Hands up—who crushed bottles 8 times smaller?"

2. Present the Experiment (10 minutes)

Goal: Retell steps and share results.

Project the 6-step plan (translated/adapted):

1. Fill big box with uncrushed bottles.

2. Measure and calculate volume.

3. Crush bottles and fill small box.

4. Measure and calculate its volume.

5. Find how many times less space (e.g., 6x, 7x, 8x, 9x).

6. Repeat with cartons.

In pairs, students retell steps using handout (2 mins). Class feedback: One student per group shares results (e.g., "Our group got 7 times less space!"). Write on board:

Group	Bottles	Cartons
1	6x	6x
2	7x	7x
3	8x	8x
4	9x	9x

Math check: "How did you calculate volume? (Length × width × height)"

3. Discuss Benefits (15 minutes)

Goal: Practice speaking and critical thinking.

Brainstorm benefits on board (from students' ideas):

-   Saves space in bins/trucks.

-   Less waste trips = less pollution.

-   Helps recycling.

- Good for planet (zero waste!).

Group activity (4 groups): Discuss prompts (5 mins):

1. Why is crushing better than just sorting?

2. What happens if everyone crushes? (e.g., "Bins would be 8 times smaller!")

3. One rule for home/school.

Groups present (1 min each). Teacher notes good phrases (e.g., "It takes up 9 times less space.").

4. Wrap-Up and Reflection (10 minutes)

Goal: Consolidate learning and connect to Erasmus+.

Class chant: "Crush it, sort it, save the planet!"

Reflection: "What surprised you? (e.g., 9 times less!)"

Homework: Draw/poster "My Zero Waste Tip" with English labels; share next Erasmus+ meeting.

Assessment: Participation rubric (speaking/math use); collect handouts.

Differentiation: Visuals for visuals; pair strong/weaker students.

Link to Project: Reinforces "Not just sort—crush!" for Zero Waste goals.

MATHS LESSON PLAN II

Lesson Theme: Environmental Data Analysis: Carbon Emissions and Sustainability

Subject: Mathematics

Level: B2 (CEFR)

Age Group: 14–17

Lesson Duration: 2 × 40 minutes

Overall Aim

To develop students' ability to analyse real environmental data, interpret graphs, percentages, and rates of change, and use mathematical reasoning to draw evidence-based conclusions about environmental issues.

Learning Objectives:

By the end of the lessons, students will be able to:

- interpret line graphs and tables related to environmental data,

- calculate percentage increase/decrease and average change,

- explain trends using mathematical and logical reasoning,

- compare data sets and justify conclusions numerically,

- apply mathematics to real-world environmental problems.

Key Mathematical Concepts

- Line graphs

- Percentage increase / decrease

- Rate of change

- Mean (average)

- Data comparison and interpretation

Materials & Resources

- Line graph: CO_2 emissions over time

- Data table (simplified real-world data)

- Calculator

- Worksheet (analysis questions)

- Projector / smart board

LESSON 1 (40 minutes)

1. Engagement / Lead-in (8 minutes)

Teacher displays a line graph showing global CO_2 emissions over several decades.

Teacher asks:

- What do you notice first?

- Is the graph increasing, decreasing, or stable?

Students respond orally using simple mathematical language:

The graph increases steadily.

Purpose:
Activate graph-reading skills and connect math to real-life data.

2. Revising Key Concepts (10 minutes)

Teacher briefly revises:

- How to read a line graph

- What "percentage increase" means

- How to calculate average change

Quick Example on Board

If emissions rise from 20 to 25 units:

- Increase = 5

- Percentage increase = $(5 \div 20) \times 100 = 25\%$

Students solve one similar example individually.

3. Data Input: Reading the Table (12 minutes)

Data Table (Example)

Year	CO_2 Emissions (units)
2000	20
2005	23
2010	26
2015	30
2020	34

Students answer:

1. In which year are emissions highest?

2. What is the overall trend?

3. How much do emissions increase from 2000 to 2020?

Teacher checks answers briefly.

4. Guided Practice: Calculations (10 minutes)

Students calculate:

- Total increase (2000 → 2020)

- Percentage increase

- Average increase per 5-year period

Students work in pairs and explain their steps.

LESSON 2 (40 minutes)

1. Review & Transition (5 minutes)

Teacher asks:

- What was the total increase?

- What does this number tell us?

Students answer using numbers + explanation.

2. Mathematical Interpretation (10 minutes)

Students complete sentences:

- The data shows a _____ increase in emissions.

- On average, emissions increase by _____ units every 5 years.

Teacher emphasizes: Mathematics helps us prove environmental changes.

3. Problem-Solving Task (15 minutes)

Task: Comparing Two Energy Sources

Energy Source	Percentage Use
Fossil Fuels	70%
Renewable Energy	30%

Questions:

1. What is the percentage difference?

2. How much must renewable energy increase to equal fossil fuels?

3. If renewable energy increases by 10%, what will the new percentages be?

Students justify answers mathematically.

4. Production Task: Data-Based Conclusion (5 minutes)

Students write a short conclusion: *Based on the data, carbon emissions have increased by ___%. This suggests that…*

Focus: Numbers → conclusion, not opinion.

5. Reflection & Closure (5 minutes)

Students answer:

- One mathematical skill I used today: _____

- One thing the data shows about the environment: _____

Assessment (Formative & Mathematical)

- Accuracy of calculations

- Correct interpretation of graphs

- Logical numerical reasoning

- Clear explanation using data

Differentiation

- Calculators allowed

- Step-by-step examples for support

- Extension task: predict future values

- Mixed-ability pairing