NUSANTARA
Capital City of Indonesia

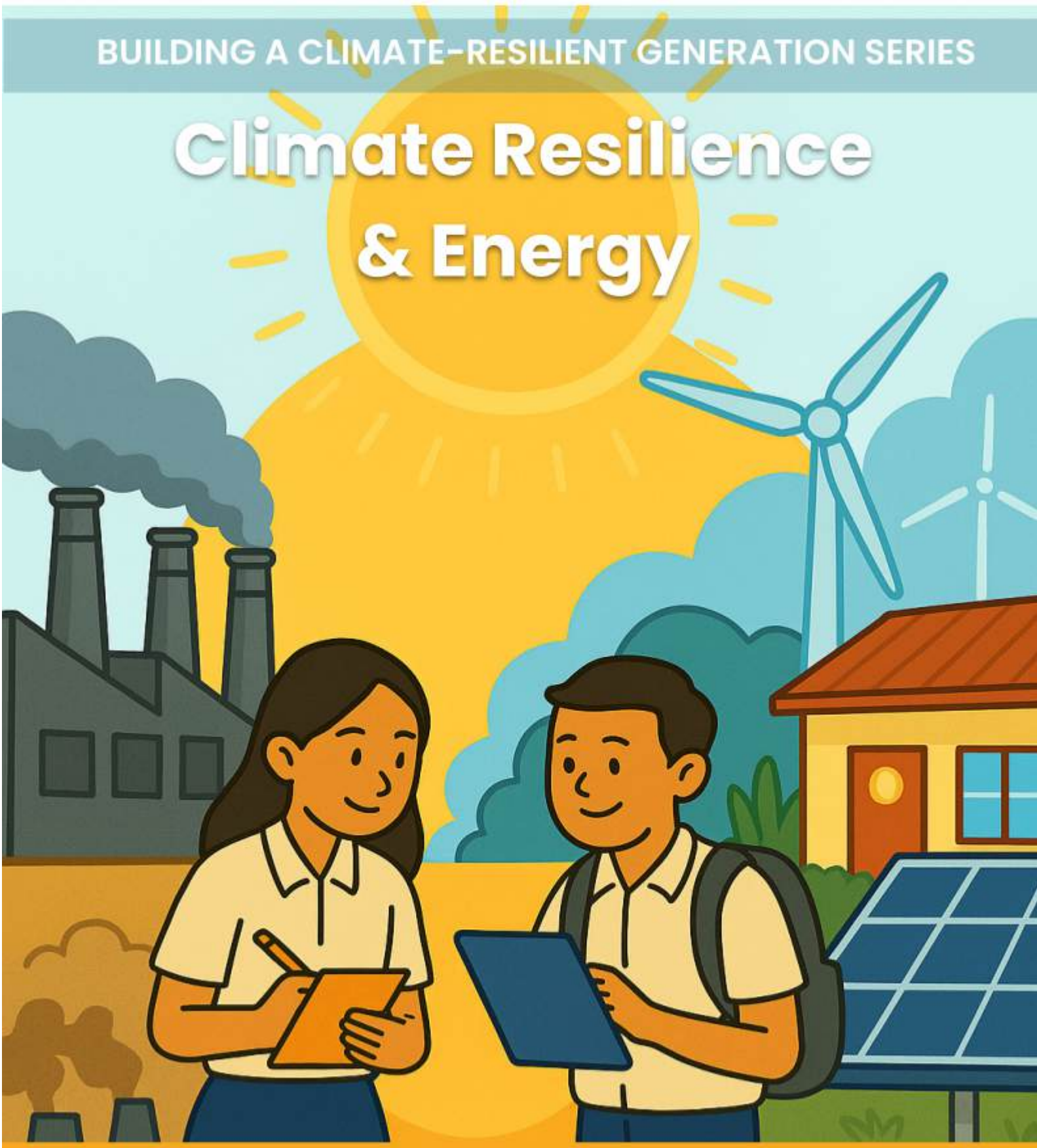
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BUILDING A CLIMATE-RESILIENT GENERATION SERIES

Climate Resilience & Energy



Teacher's Guide for Junior Secondary School Grade 9

Prepared for the Nusantara Capital Authority • September 2025

Building Climate Resilience in Nusantara (IKN)

Welcome to the fourth handbook in the ***Nusantara Green Climate Resilience Education*** series. This volume is for **Upper Secondary School (SMP Class 9)**. These materials are part of a national effort to help young people in Nusantara learn and practice smart, powerful actions that save energy, reduce greenhouse gases, and prepare communities for a safer, climate-resilient future.

About Climate Resilience in IKN

Indonesia's new capital city, **Nusantara**, is envisioned as a living example of how people and nature can thrive together—built not only as the nation's administrative heart, but also as a global model for sustainability, resilience, and harmony with the environment.

Climate change and other environmental hazards already shape life across Indonesia. Heavy rains can quickly cause floods and landslides, hotter days increase the need for cooling, and burning fossil fuels and waste pollute the air and water, creating health risks for communities. By learning how energy choices affect climate resilience, schools in Nusantara will help their students practice smart habits that save energy, reduce emissions, and prepare for a safer, more sustainable future—ensuring that Nusantara grows as a model of a green and resilient city for generations to come.

The Purpose of This Series

The **Nusantara Green Climate Resilience Education** handbooks are designed to:

- **Equip teachers** with ready-to-use activities that make climate resilience engaging and practical for their students.
- **Show the connection** between daily energy habits and climate challenges such as greenhouse gas emissions, rising temperatures, and disaster risks.
- **Encourage schools** to become role models in the community, demonstrating energy-smart actions that others can follow.

A Message for Teachers

As a teacher, you are guiding your learners on their journey into caring for the Earth. Every question you ask, every small routine you reinforce, helps your learners understand that their actions matter. Your role is essential in raising a generation of students who are proud of their city, connected to their environment, and ready to face future challenges with confidence.

Thank you for leading this journey—step by step, habit by habit.

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About This Handbook

Aims of This Handbook

As part of the ***Nusantara Green Climate Resilience Education*** series, this handbook provides teachers with clear guidance, background knowledge, and classroom activities. Its purpose is to give you the confidence and tools to introduce learners to climate change and energy efficiency in ways that are simple, memorable, and meaningful.

Specifically, this handbook will help you guide students to:

- **Understand Climate Change in Nusantara** – recognize how energy use drives greenhouse gas emissions and why smart choices matter for resilience.
- **Practice Energy-Smart Habits** – learn how to save energy at school and at home through everyday actions that reduce waste and improve comfort.
- **See Energy as a Climate Issue** – understand that energy is not only about electricity and costs, but also about reducing emissions, improving health, and building a sustainable future for Nusantara.

How to Use This Handbook

You don't need to be an expert in climate change or energy to use this handbook — the guidance here will help you explain key ideas in simple, age-appropriate ways. By using this handbook, you will be able to:

- Gain information on **climate change and energy use**, along with **common misconceptions**, in clear language to share with your learners.
- Use **discussion prompts** to start short conversations that connect energy habits to your learners' daily lives.
- Facilitate **step-by-step activities** with clear objectives and reflection questions.
- Optionally, extend learning with **student-led and community projects**.
- Apply **evaluation tools** to check learning outcomes and celebrate progress.

Each activity follows the same format—**Objective** → **Preparation** → **Steps** → **Reflection Questions** → **Learning Outcome**—so you can easily see how to prepare, what to do, and how to guide reflection.

Why Use Creative Learning Activities?

Learners understand best when they can **see**, **do**, and **feel**. These activities are designed so that they can::

- **See** how energy is used and wasted in their daily lives.
- **Do** practical tasks like audits, calculations, and campaigns to practice saving energy.
- **Feel** empowered by choosing actions that reduce emissions and make their school and homes more comfortable.

Activities make learning memorable, fun, and practical. They are not just games—they are **building blocks towards climate resilience**. When your learners practice habits like switching off lights, unplugging devices, or using fans instead of AC, they:

- Save energy and lower costs.
- Reduce greenhouse gas emissions.
- Protect health and strengthen resilience against climate change.

By making lessons active, you help learners connect everyday energy choices to the bigger picture of **protecting Nusantara and the Earth**.

How to Facilitate Creative Learning Activities

The activities in this handbook are **climate-smart, hands-on, and play-based**. Each one is supported by activity sheets and designed to be simple, visual, and enjoyable for your learners. Your role is to guide them step by step so they can connect everyday habits with saving energy and caring for the Earth.



Getting Ready

Take a little time to prepare before a class begins. Review the associated materials, prepare some questions for discussions. Print any associated activity sheets, gather needed props and arrange the space so that all learners can see and take part.

Framing Activities

You may want to start your sessions with a short story or a simple question to catch your students' attention and link the activity they will do to the local context, recent events or their daily lives. For example, you might ask: *"What happens if everyone leaves the lights on all day?"*





Reflection and Connection

After a session, spend a few minutes reflecting together. Ask questions such as: *"Why is it important to save energy?"* Aim to connect their answers to climate resilience, for example: how wasting electricity adds greenhouse gases.

Celebrate Success

Acknowledge your students' good ideas in class and highlight strong examples from their audits and recommendations. Invite groups to share their findings, and remind them that small actions can add up to big change at school and at home.





Your Students as Ambassadors

Whenever possible, use a homework format or encourage your learners to take their creative project outcomes home so that their families and community members can see, appreciate, and take part in the lessons they are bringing from school.

Work Together as a School

Climate-smart habits are stronger when the whole school community is involved. Share ideas and experiences with other teachers, and celebrate collective action through events such as an “Energy-Saving Day.” Encourage your students to share what they have learned with others.



Remember: Students in the age group learn best when they are **active**, **recognized**, and **can see the results of their efforts**. By linking everyday energy choices to climate resilience, you help them take important steps toward becoming responsible stewards of the Earth.

Topic Orientation

About Climate Change & Energy

Climate Change – The Challenge

Climate change means long-term changes in weather caused mostly by human activities such as burning fuels, cutting forests, and poor land use. In Nusantara, these changes can already be seen in daily life. Rising energy use adds more greenhouse gases to the atmosphere, making days hotter, storms stronger, and seasons less predictable.

For your learners, these big issues should be explained through their own experiences, such as overheated classrooms, blackouts when demand for electricity is too high, or the cost of wasted electricity at home and school.

Energy – More Than Just Electricity

Energy is not only about powering lights or machines. The way we use energy shapes climate change and affects community resilience.



Energy and Emissions
Most electricity still comes from burning coal, oil, or gas. Wasting energy means releasing more greenhouse gases that make the Earth hotter.



Energy and Costs
Every wasted watt also wastes money and resources. Using energy efficiently lowers costs for families, schools, and communities.



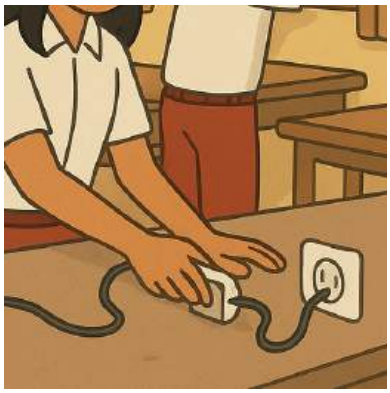
Energy and Resilience
Efficient schools and homes stay cooler, need fewer resources, and are less affected by blackouts or shortages. Using clean and efficient energy makes communities stronger against climate impacts.

Solutions – What We Can Do in Schools



Switch Off When Not Needed
Turn off lights, fans, and projectors in empty rooms. Small habits like this save energy, reduce bills, and cut greenhouse gas emissions.

Use Efficient Bulbs
Check classrooms for old bulbs and replace them with LEDs. They use far less power, give good light, and last much longer.



Unplug Devices
Chargers and appliances still use power when plugged in. Unplugging them after class or at the end of the day saves energy.

Cool Smartly
Keep doors and windows closed when AC is on, set a reasonable temperature, and choose instead to use fans or shade when possible.



Plant and Protect Trees
Trees around classrooms give shade, lower heat, and reduce the need for cooling. They also make school grounds more pleasant.

Travel Wisely
Walk, bike, or share rides when possible. Fewer vehicles mean cleaner air, less fuel use, and lower carbon emissions.

Common Misconceptions & Clarifications

Students, and even adults, sometimes hold misleading ideas about energy and climate. As a teacher, you can guide your learners toward better understanding. For example, many believe that switching off one light does not matter.

You can remind them that if everyone leaves lights on, the waste adds up to higher costs, more fuel burned, and more greenhouse gases in the air.

Common Misconception	Clarification
"Switching off one light makes no difference."	Every light adds up. Turning them off saves money and reduces emissions.
"Chargers don't use power when nothing is charging."	Chargers and appliances keep drawing small amounts of energy unless unplugged.
"AC is always better than fans."	Fans use far less energy. AC should be used only when needed and at a reasonable temperature.
"LEDs are not brighter than old bulbs."	LEDs give the same or better light while using much less power.
"Energy efficiency is expensive."	Many actions, like switching off lights or unplugging devices, cost nothing and save money.
"Planting trees doesn't save energy."	Trees give shade and cooling, which reduces the need for fans and AC.
"Only governments can solve energy problems."	Every action matters. Schools, families, and students all play a part in saving energy.
"Clean energy is not reliable."	Solar, wind, and other clean sources are increasingly reliable and reduce dependence on fossil fuels.

Creative In-Class Activity Examples

Please note that the activities included in this handbook are examples designed for specific learner levels. Teachers are encouraged to adapt them as they wish, and create their own activities to suit the needs of their class and grade level.

Creative Learning Activity Flow

The activities in this handbook are designed to follow a natural learning flow.

Each learning session can start with a short in-class discussion that helps learners connect the topic to their everyday lives. This is followed by a hands-on activity using provided, photocopyable activity sheets, where learners can explore new habits in fun and engaging ways. An evaluation activity is included to help teachers measure what students have learned at the conclusion of this book.

Guidance on how to use all the materials needed for these steps, such as discussion points, activity sheets, and evaluation tools, is provided below.

In-Class Discussions

Short discussions help your students connect their own experiences with the bigger idea of climate resilience. These conversations should be simple, lively, and no longer than five minutes. A well-guided discussion can prepare students for the activity ahead or help them reflect afterwards.

When beginning a conversation, keep it practical and close to their daily lives. Show them something familiar, such as a phone charger, a light switch, or a fan, and let them share what they already know. Talk about things they see every day—lights left on in classrooms or AC running with windows open.

It is often more effective **to ask than to tell.** Questions like *"What happens if everyone leaves the lights on all day?"* invite students to think and respond. Acknowledge their answers, highlight strong examples, and encourage them to share habits they already practice at home. Always close by linking the discussion to a clear action they can take, for example: *"Today we will remember to switch off projectors after class."*

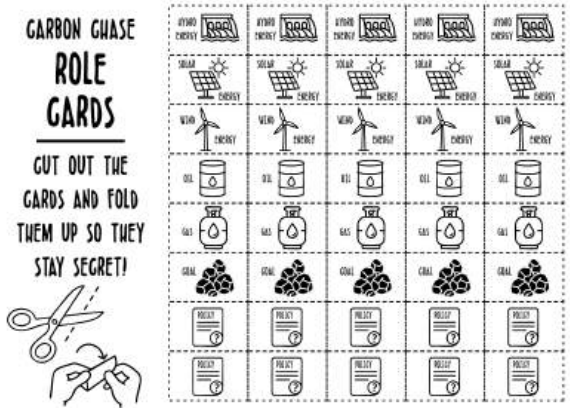
Tips for guiding discussions:

- **Keep it visual** – use real objects or pictures.
- **Use everyday examples** – connect to things your learners see and know.
- **Ask open questions** – encourage thinking and sharing.
- **Celebrate ideas –** acknowledge contributions & highlight strong examples
- **Link to action** – finish with one clear habit the class will practice.

Each activity in your handbook comes with some suggested discussion points, feel free to also design your own based on current events and situations at the time of delivering your classes.

Warm Up Activity: Carbon Chase

Teacher Tips Use this activity at the start of class to boost energy and prepare students to think about how energy choices affect climate change. *If different genders holding hands is not appropriate in your school, divide the class into two separate circles, one for boys and one for girls, and run the game in both groups.*



Preparation

Photocopy, cut out, and fold the Role Cards (see 'Creative Activity Sheets'):

- **Fossil Fuel Energy** (oil, gas & coal)
- **Renewable Energy** (solar, hydro & wind)
- **Energy Transition Policy**

The Setup

1. There are two roles that are not on cards: **Carbon** and **Climate Hero**. Select two students to play these roles, then ask the other students to form a circle.
2. Randomly hand out the **folded Role Cards** to all the students in the circle. Tell them the the following:
    - *I just gave you a role card. You must keep it a secret.*
    - *Look at it to see your role:*
        - *If it has oil, gas or coal you are **Fossil Fuel Energy**.*
        - *If it has solar, hydro, or wind you are **Renewable Energy**.*
        - *If it has a policy document, you are **Energy Transition Policy.***
    - *Memorize your role, then hide your card.*
    - *Now hold hands with the two people next to you.*
3. Once the students are holding hands, ask the **Climate Hero** to stand **inside the circle**, and the **Carbon** to stand **outside the circle**. Now you are ready to explain the rules on the next page.

How to Play Carbon Chase

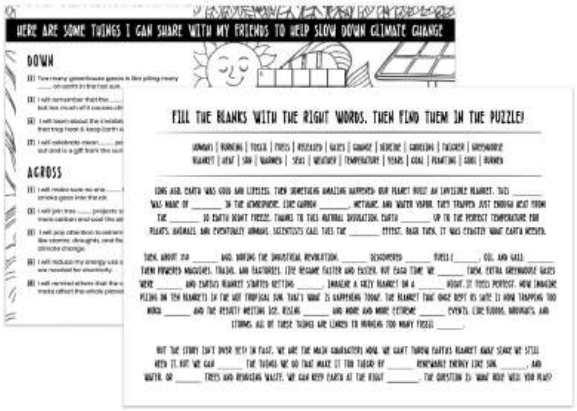
1. First, explain the goals of each role:
    - The **Climate Hero**'s goal is to catch the Carbon
    - The **Carbon's** goal is to stay away from the Climate Hero
    - The **Fossil Fuel**'s goal is to help the Carbon escape
    - The **Renewable Energy**'s goal is to help the Climate Hero
    - The **Energy Transition Policy** can help whichever they choose
    - Students in the circle raise or lower their arms to block or allow Carbon and Climate Hero to pass.
2. Next, say, "1, 2, 3, go!" to start the chase.
3. The game ends when **Carbon** is caught.
4. If time allows, choose new students for every role and play again!

Optional Reflection Questions for this Activity

- Who had more power to control Carbon's movement?
- How did Energy Transition choices affect the game?
- What does this show us about today's real-world energy systems?

Activity 1a & 1b: Fill in the Blanks & Crossword

Objective Students learn key terms about energy and climate change by completing a short story and crossword.



Preparation

- Photocopy enough "Fill in the blank…" and "Crossword" activity sheets (see 'Creative Activity Sheets') for all of your learners.
- Have enough pencils ready for all of your students to use.

Optional Discussion Prompts for this Activity

- Where does most of our energy come from today?
- How do you think that affects the Earth?

Instructions

1. Hand out the "Fill in the blanks…" story sheets. Ask students to fill in the blanks using the word bank at the top of the page.
2. When most are finished, review the story as a class by reading it aloud and checking answers together.
3. Next, hand out the Crossword sheets. Explain that the answers are the same words they just used in the story.
4. Allow time for students to complete the puzzle, then go through the answers as a group.

Optional Reflection Questions for this Activity

- Why do we call greenhouse gases an "Earth's blanket"?
- Which gases are the most important in trapping heat?
- How does human activity add more to the blanket?

Reviewing this Activity

See the 'Answer Key' section for answers to this activity sheet.

Activity 2: Cleaner, Greener Future Story

Objective LStudents learn how energy use and climate change are connected by using key facts to complete a story



Preparation

- Photocopy enough "Cleaner, Greener Future" activity sheets (see 'Creative Activity Sheets') for all of your learners.
- Have enough pencils ready for all of your students to use.

Optional Discussion Prompts for this Activity

- What happens to the Earth when we burn coal, oil, and gas?
- Which energy sources will not run out?
- How can saving energy reduce emissions?

Instructions

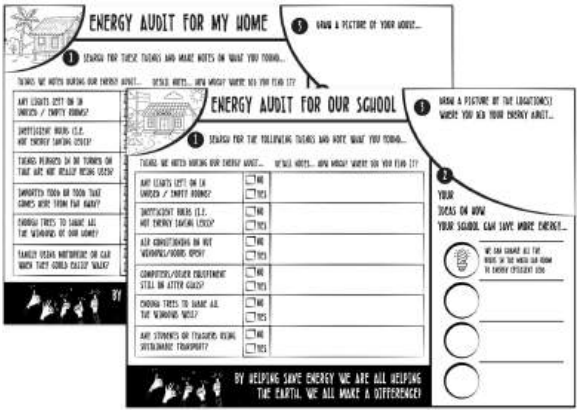
1. Hand out the "Cleaner, Greener Future" activity sheet. Explain that the facts on the left are clues, and students will use them to fill in the missing words in the story on the right.
2. Give students time to work individually or in pairs.
3. When most are finished, read the story aloud as a class. Pause at each blank so students can give their answers, then confirm the correct ones.
4. Briefly discuss how each fact shows the link between energy use, greenhouse gases, and climate resilience in Nusantara

Reviewing this Activity

See the 'Answer Key' section for answers to this activity sheet.

Activity 3a & 3b: Energy Audit at School & at Home

Objective Students investigate energy use in their school and homes, identify areas of waste, and suggest realistic improvements.



Preparation

- Make 5 photocopies of the *"School Audit"* activity sheets (see 'Creative Activity Sheets') for all of your learners for Part A.
- Photocopy enough of the "Home Audit" activity sheets (in the appendix) for all of your learners for Part B..

Optional Discussion Prompt for this Activity

- Why does saving energy matter for both money and the climate?

Part A: School Audit (Group Work)

1. Divide the class into **five groups**. Give each one a "School Audit" checklist.
2. Explain that groups will explore the school and record their observations. They should check "yes" or "no" for each question and provide details of what they found.
3. After their audit, groups should write in three ideas for improvement.
4. The audit can be assigned as **homework or done during class time.**
5. In the following session, dedicate 10 minutes for each group to present their findings and their ideas for saving energy.

Part B: School Audit (Group Work)

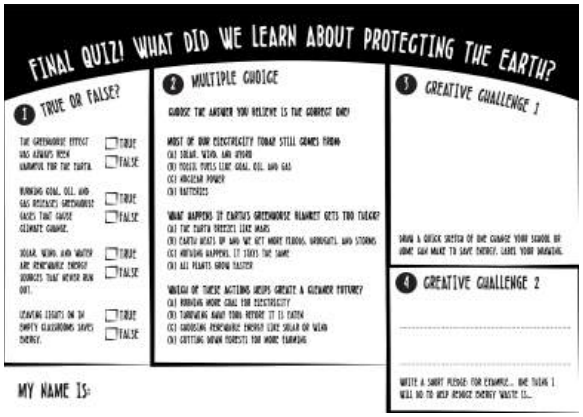
1. After the presentations, hand out the Home Audit checklist to each learner.
2. Students complete the checklist at home by talking with family members.
3. Each student should also write three improvement ideas their family could realistically adopt.
4. Collect the homework in the next class.

Reviewing this Activity

This activity is very much dependent on individual findings. There are some guidelines for review in the *"Answer Key"* section.

Evaluation Activity: Final Quiz

Objective Learners demonstrate their understanding of climate change, energy, and resilience through a short quiz and creative tasks.



Preparation

- Enough copies of the *"Final Quiz"* evaluation sheets (see 'Creative Activity Sheets') for all of your learners.
- Enough pencils and coloured pencils for your learners.

Instructions

1. Hand out the *Final Quiz* sheet to each student.
2. Explain that it has two parts:
    - **Quiz Questions (Sections 1 & 2)**: Students answer true/false and multiple-choice questions about greenhouse gases, energy, and climate change.
    - **Creative Challenges (Sections 3 & 4)**: Students draw a quick sketch of one change to save energy, and write a short pledge of something they will personally do.
3. Allow students about enough time to complete the sheet.
4. Collect the sheets for review.

Grading this Sheet

- **True/False & Multiple Choice**: Check answers against the key (see Answer Key section).
- **Creative Challenge 1 (Sketch)**: Look for a realistic and clearly explained idea (e.g., switching to LEDs, planting trees, turning off AC when not needed).
- **Creative Challenge 2 (Pledge)**: Look for a specific, practical action the student could take (e.g., unplugging devices, using fans instead of AC, walking to school).

Optional Extension Activities

The following are some examples of activities that extend learning beyond the classroom and connect directly to challenges faced in Nusantara and across Kalimantan. They encourage your students to take responsibility, involve their families and the community, and show how energy efficiency and climate-smart habits reduce real risks such as heatwaves, blackouts, and rising emissions.

Even small projects can make a difference! With teacher support, students can lead activities that grow into long-lasting habits for the whole school.

Student-Led Project Ideas

Switch Off Campaign

Students design small reminder systems in various formats (small signs to post next to switches, class monitoring systems, announcements) to make sure lights, fans, and other equipment that uses electricity are turned off when not in use.

Resilience Link: Builds daily habits that save energy, cut costs, and reduce emissions across the whole school.

Shade and Cool Project

Students identify areas of indoor and outdoor spaces that would benefit from being better shaded. They then plan and lead a small greening & shading effort, that includes planting trees or setting up tall plants in the ground or in pots around classrooms or schoolyards.

Resilience Link: Natural shade lowers heat, reduces the need for cooling, and makes the school more comfortable.

Tips for Teachers: Encourage your learners to share their project progress during class meetings or assemblies. Set up a progress board to track achievements. As their confidence grows, invite them to present their strategies to other classes or at school events so their ideas spread



Connecting with Community

The following optional activities give learners the chance to connect with local expertise and see real-life examples of climate and waste solutions.

Community Energy Talk

Invite a local energy expert, utility worker, or community leader to speak with your learners about how energy is produced and used in Nusantara. After the talk, students can ask questions and share their thoughts about renewable energy and their own ideas for saving energy at school and at home.

Field Experience

Learners walk around a nearby area to observe how energy is used (for example, streetlights, shops, vehicles, or household cooling). They should note both positive examples (like LED lights or bicycles) and areas for improvement (like lights left on in daylight or engines idling). Back at school, they share their observations and propose simple changes.

Tips for Teachers: Involve learners in choosing the guest or visit, and prepare them with guiding questions. Keep the session short and interactive. Afterwards, ask: *"What new thing did you learn? How can we use this in our school or community?*

Answer Keys for Activity Sheets

(FOR TEACHER REFERENCE)

FILL THE BLANKS WITH THE RIGHT WORDS. THEN FIND THEM IN THE PUZZLE!

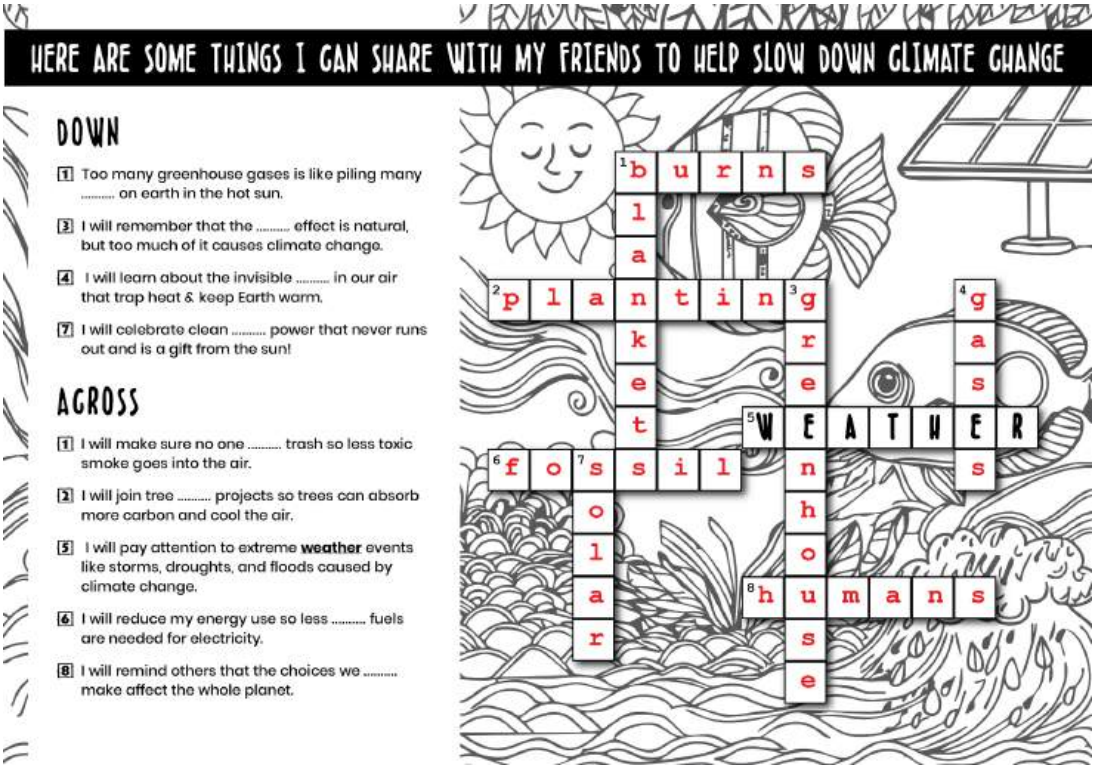
HUMANS | BURNING | FOSSIL | FUELS | RELEASED | GASES | CHANGE | DIOXIDE | CHOOSING | TRICKER | GREENHOUSE
BLANKET | HEAT | SUN | WARMED | SEAS | WEATHER | TEMPERATURE | YEARS | GOAL | PLANTING | COOL | BURNED

LONG AGO, EARTH WAS COLD AND LIFELESS. THEN SOMETHING AMAZING HAPPENED: OUR PLANET BUILT AN INVISIBLE BLANKET. THIS BLANKET WAS MADE OF GASES IN THE ATMOSPHERE, LIKE CARBON DIOXIDE, METHANE, AND WATER VAPOR. THEY TRAPPED JUST ENOUGH HEAT FROM THE SUN SO EARTH DIDN'T FREEZE. THANKS TO THIS NATURAL INSULATION, EARTH WARMED UP TO THE PERFECT TEMPERATURE FOR PLANTS, ANIMALS, AND EVENTUALLY HUMANS. SCIENTISTS CALL THIS THE GREENHOUSE EFFECT. BACK THEN, IT WAS EXACTLY WHAT EARTH NEEDED.

THEN, ABOUT 150 YEARS AGO, DURING THE INDUSTRIAL REVOLUTION, HUMANS DISCOVERED FOSSIL FUELS (COAL , OIL, AND GAS). BURNING THEM POWERED MACHINES, TRAINS, AND FACTORIES. LIFE BECAME FASTER AND EASIER. BUT EACH TIME WE BURNED THEM, EXTRA GREENHOUSE GASES WERE RELEASED AND EARTH'S BLANKET STARTED GETTING TRICKER. IMAGINE A COZY BLANKET ON A COOL NIGHT. IT FEELS PERFECT. NOW IMAGINE PILING ON TEN BLANKETS IN THE HOT TROPICAL SUN. THAT'S WHAT IS HAPPENING TODAY. THE BLANKET THAT ONCE KEPT US SAFE IS NOW TRAPPING TOO MUCH HEAT AND THE RESULT? MELTING ICE, RISING SEAS AND MORE AND MORE EXTREME WEATHER EVENTS, LIKE FLOODS, DROUGHTS, AND STORMS. ALL OF THESE THINGS ARE LINKED TO BURNING TOO MANY FOSSIL FUELS .

BUT THE STORY ISN'T OVER YET! IN FACT, WE ARE THE MAIN CHARACTERS NOW. WE CAN'T THROW EARTH'S BLANKET AWAY SINCE WE STILL NEED IT. BUT WE CAN CHANGE THE THINGS WE DO THAT MAKE IT TOO THICK! BY CHOOSING RENEWABLE ENERGY LIKE SUN, WIND , AND WATER, OR PLANTING TREES AND REDUCING WASTE. WE CAN KEEP EARTH AT THE RIGHT TEMPERATURE. THE QUESTION IS: WHAT ROLE WILL YOU PLAY?

Your learners should fill in the missing words with the correct terms. The correct answers are shown in red



Your learners should complete the crossword with the same key terms from the story. The correct answers are shown in red

TELL A STORY ABOUT A CLEANER, GREENER FUTURE FOR US ALL!

HERE ARE SOME FACTS FOR YOU TO USE FOR REFERENCE...

- BURNING FOSSIL FUELS LIKE COAL, OIL, & GAS RELEASES GREENHOUSE GASES THAT CAUSE CLIMATE CHANGE.
- RENEWABLE ENERGY SOURCES, FOR EXAMPLE: SOLAR, WIND, HYDRO, GEOTHERMAL, BIOMASS, DON'T RUN OUT. THEY ALSO DON'T CAUSE MUCH CARBON EMISSIONS.
- ENERGY EFFICIENCY MEANS USING LESS ENERGY.
- FOSSIL FUELS ARE THE MAIN THING WE USE TO MAKE ELECTRICITY. THIS CAUSES A LOT OF POLLUTION.
- BURNING COAL AND OIL CREATES SMOKE AND AIR POLLUTION THAT HARMS BOTH OUR AND THE PLANET'S HEALTH.
- SOLAR ENERGY WHICH USES SOLAR PANELS TO CAPTURE ENERGY FROM THE SUN IS A GREAT RENEWABLE OPTION.
- CLEAN ENERGY IS USED IN SMART, GREEN CITIES.
- TRANSITIONING TO RENEWABLE ENERGY SOURCES IS ONE OF THE WAYS TO CREATE NEW 'GREEN' JOBS.
- SAVING WATER ALSO HELPS TO REDUCE CARBON EMISSIONS BECAUSE YOU NEED LESS PUMPING & WASTEWATER TREATMENT.

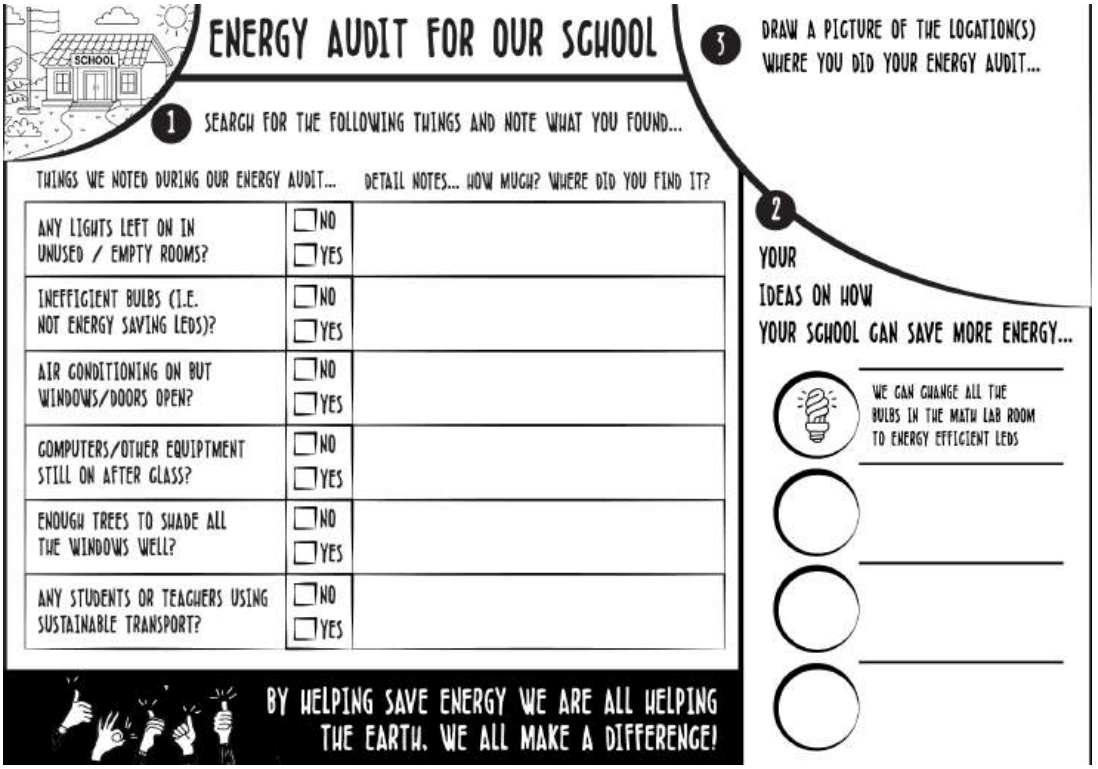


CLIMATE CHANGE IS MAINLY CAUSED BY BURNING FOSSIL FUELS. BURNING FOSSIL FUELS LIKE COAL, OIL, AND GAS RELEASE GREENHOUSE GASES INTO THE AIR, WHICH TRAP HEAT & MAKE THE EARTH HOTTER. RIGHT NOW, MOST OF OUR ELECTRICITY COMES FROM COAL, OIL, AND GAS. THESE FUELS CREATE SMOKE AND POLLUTION THAT HARMS OUR HEALTH.

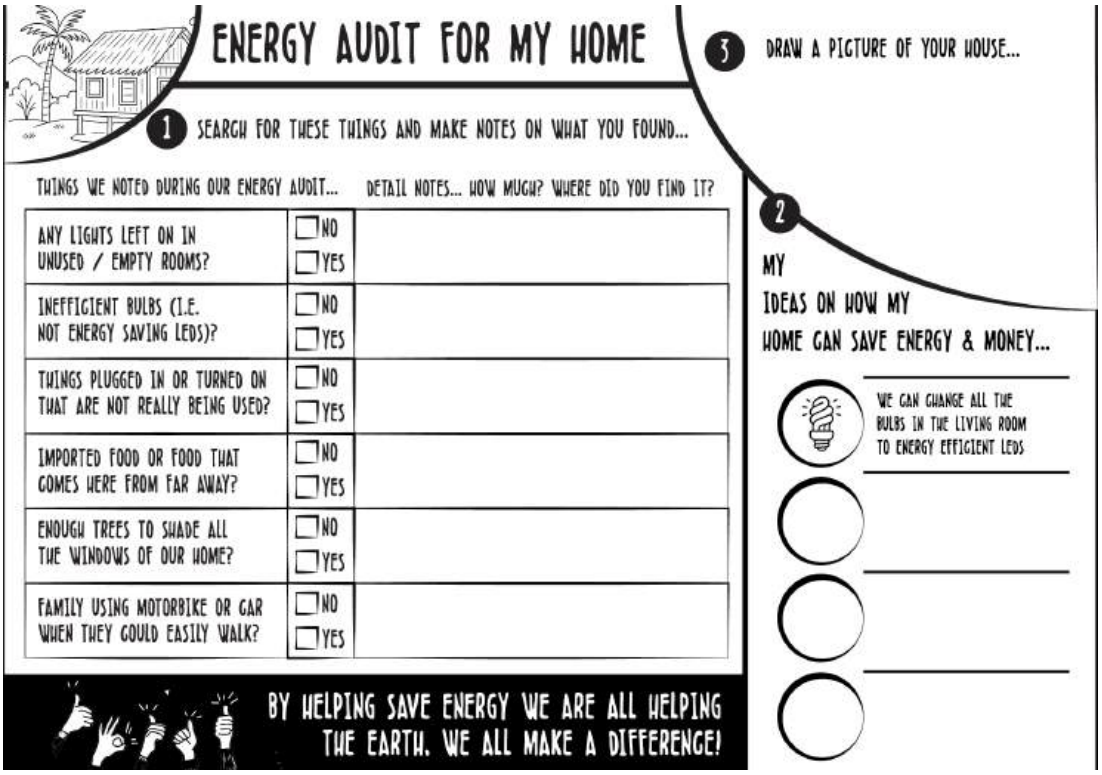
BUT WE HAVE BETTER OPTIONS! SOLAR ENERGY FROM THE SUN, WIND, AND OTHER RENEWABLE SOURCES WON'T RUN OUT. IT'S CLEAN, SAFE, AND PRODUCES ALMOST NO GREENHOUSE GASES. WE CAN ALSO PRACTICE ENERGY EFFICIENCY (USING LESS ENERGY), WHICH SAVES MONEY AND REDUCES CARBON EMISSIONS.

IN THE FUTURE, SMART CITIES WILL RUN ON CLEAN ENERGY, AND AS COUNTRIES SWITCH TO RENEWABLES, NEW GREEN JOBS WILL BE AVAILABLE FOR YOUNG PEOPLE LIKE ME!

Your learners should use the facts on the left to fill in the blanks in the story on the right. The correct answers in red



The groups should have observations in each row, and identify effective and realistic areas for improvement.



ENERGY AUDIT FOR MY HOME

1 SEARCH FOR THESE THINGS AND MAKE NOTES ON WHAT YOU FOUND...

THINGS WE NOTED DURING OUR ENERGY AUDIT...		DETAIL NOTES... HOW MUCH? WHERE DID YOU FIND IT?
ANY LIGHTS LEFT ON IN UNUSED / EMPTY ROOMS?	☐ NO ☐ YES	
INEFFICIENT BULBS (I.E. NOT ENERGY SAVING LEDS)?	☐ NO ☐ YES	
THINGS PLUGGED IN OR TURNED ON THAT ARE NOT REALLY BEING USED?	☐ NO ☐ YES	
IMPORTED FOOD OR FOOD THAT COMES HERE FROM FAR AWAY?	☐ NO ☐ YES	
ENOUGH TREES TO SHADE ALL THE WINDOWS OF OUR HOME?	☐ NO ☐ YES	
FAMILY USING MOTORBIKE OR CAR WHEN THEY COULD EASILY WALK?	☐ NO ☐ YES	

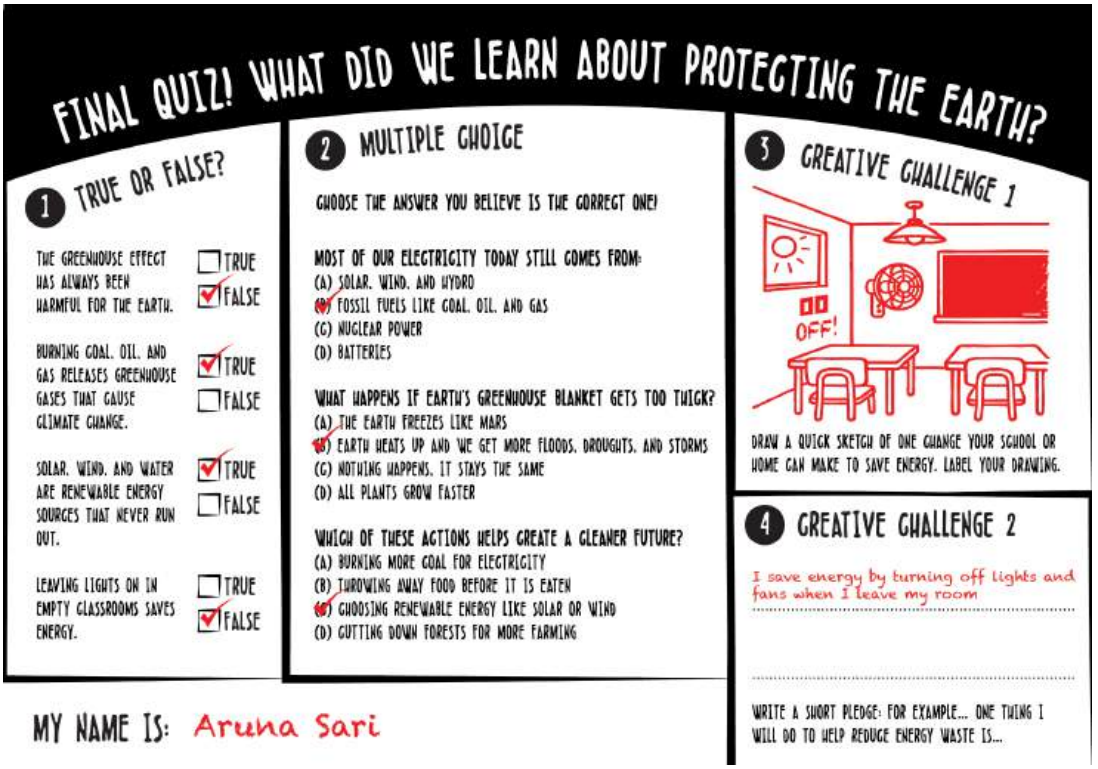
BY HELPING SAVE ENERGY WE ARE ALL HELPING THE EARTH. WE ALL MAKE A DIFFERENCE!

3 DRAW A PICTURE OF YOUR HOUSE...

2 MY IDEAS ON HOW MY HOME CAN SAVE ENERGY & MONEY...

WE CAN CHANGE ALL THE BULBS IN THE LIVING ROOM TO ENERGY EFFICIENT LEDS

The learners should have observations in each row, and identify three effective and realistic areas for improvement.



FINAL QUIZ! WHAT DID WE LEARN ABOUT PROTECTING THE EARTH?

1 TRUE OR FALSE?

THE GREENHOUSE EFFECT HAS ALWAYS BEEN HARMFUL FOR THE EARTH.	☐ TRUE	☑ FALSE
BURNING COAL, OIL, AND GAS RELEASES GREENHOUSE GASES THAT CAUSE CLIMATE CHANGE.	☑ TRUE	☐ FALSE
SOLAR, WIND, AND WATER ARE RENEWABLE ENERGY SOURCES THAT NEVER RUN OUT.	☑ TRUE	☐ FALSE
LEAVING LIGHTS ON IN EMPTY CLASSROOMS SAVES ENERGY.	☐ TRUE	☑ FALSE

2 MULTIPLE CHOICE

CHOOSE THE ANSWER YOU BELIEVE IS THE CORRECT ONE!

MOST OF OUR ELECTRICITY TODAY STILL COMES FROM:
(A) SOLAR, WIND, AND HYDRO
(B) FOSSIL FUELS LIKE COAL, OIL, AND GAS
(C) NUCLEAR POWER
(D) BATTERIES

WHAT HAPPENS IF EARTH'S GREENHOUSE BLANKET GETS TOO THICK?
(A) THE EARTH FREEZES LIKE MARS
(B) EARTH HEATS UP AND WE GET MORE FLOODS, DROUGHTS, AND STORMS
(C) NOTHING HAPPENS, IT STAYS THE SAME
(D) ALL PLANTS GROW FASTER

WHICH OF THESE ACTIONS HELPS CREATE A CLEANER FUTURE?
(A) BURNING MORE COAL FOR ELECTRICITY
(B) THROWING AWAY FOOD BEFORE IT IS EATEN
(C) CHOOSING RENEWABLE ENERGY LIKE SOLAR OR WIND
(D) CUTTING DOWN FORESTS FOR MORE FARMING

MY NAME IS: Aruna Sari

3 CREATIVE CHALLENGE 1

OFF!

DRAW A QUICK SKETCH OF ONE CHANGE YOUR SCHOOL OR HOME CAN MAKE TO SAVE ENERGY. LABEL YOUR DRAWING.

4 CREATIVE CHALLENGE 2

I save energy by turning off lights and fans when I leave my room

WRITE A SHORT PLEDGE: FOR EXAMPLE... ONE THING I WILL DO TO HELP REDUCE ENERGY WASTE IS...

The red answers show the correct responses for all true/false and multiple-choice questions. For the creative sections, learners should provide effective and realistic examples.

Creative Activity Sheet Masters

(FOR PHOTOCOPYING)

CARBON CHASE

ROLE CARDS

CUT OUT THE CARDS AND FOLD THEM UP SO THEY STAY SECRET!



HYDRO ENERGY	HYDRO ENERGY	HYDRO ENERGY	HYDRO ENERGY	HYDRO ENERGY
SOLAR ENERGY	SOLAR ENERGY	SOLAR ENERGY	SOLAR ENERGY	SOLAR ENERGY
WIND ENERGY	WIND ENERGY	WIND ENERGY	WIND ENERGY	WIND ENERGY
OIL	OIL	OIL	OIL	OIL
GAS	GAS	GAS	GAS	GAS
GOAL	GOAL	GOAL	GOAL	GOAL
POLICY	POLICY	POLICY	POLICY	POLICY
POLICY	POLICY	POLICY	POLICY	POLICY

FILL THE BLANKS WITH THE RIGHT WORDS. THEN FIND THEM IN THE PUZZLE!

HUMANS | BURNING | FOSSIL | FUELS | RELEASED | GASES | CHANGE | DIOXIDE | CHOOSING | THICKER | GREENHOUSE
BLANKET | HEAT | SUN | WARMED | SEAS | WEATHER | TEMPERATURE | YEARS | GOAL | PLANTING | COOL | BURNED

LONG AGO, EARTH WAS COLD AND LIFELESS. THEN SOMETHING AMAZING HAPPENED: OUR PLANET BUILT AN INVISIBLE BLANKET. THIS _____ WAS MADE OF _____ IN THE ATMOSPHERE, LIKE CARBON _____, METHANE, AND WATER VAPOR. THEY TRAPPED JUST ENOUGH HEAT FROM THE _____ SO EARTH DIDN'T FREEZE. THANKS TO THIS NATURAL INSULATION, EARTH _____ UP TO THE PERFECT TEMPERATURE FOR PLANTS, ANIMALS, AND EVENTUALLY HUMANS. SCIENTISTS CALL THIS THE _____ EFFECT. BACK THEN, IT WAS EXACTLY WHAT EARTH NEEDED.

THEN, ABOUT 150 _____ AGO, DURING THE INDUSTRIAL REVOLUTION, _____ DISCOVERED _____ FUELS (_____, OIL, AND GAS). _____ THEM POWERED MACHINES, TRAINS, AND FACTORIES. LIFE BECAME FASTER AND EASIER. BUT EACH TIME WE _____ THEM, EXTRA GREENHOUSE GASES WERE _____ AND EARTH'S BLANKET STARTED GETTING _____. IMAGINE A COZY BLANKET ON A _____ NIGHT. IT FEELS PERFECT. NOW IMAGINE PILING ON TEN BLANKETS IN THE HOT TROPICAL SUN. THAT'S WHAT IS HAPPENING TODAY. THE BLANKET THAT ONCE KEPT US SAFE IS NOW TRAPPING TOO MUCH _____ AND THE RESULT? MELTING ICE, RISING _____ AND MORE AND MORE EXTREME _____ EVENTS, LIKE FLOODS, DROUGHTS, AND STORMS. ALL OF THESE THINGS ARE LINKED TO BURNING TOO MANY FOSSIL _____.

BUT THE STORY ISN'T OVER YET! IN FACT, WE ARE THE MAIN CHARACTERS NOW. WE CAN'T THROW EARTH'S BLANKET AWAY SINCE WE STILL NEED IT. BUT WE CAN _____ THE THINGS WE DO THAT MAKE IT TOO THICK! BY _____ RENEWABLE ENERGY LIKE SUN, _____, AND WATER, OR _____ TREES AND REDUCING WASTE. WE CAN KEEP EARTH AT THE RIGHT _____. THE QUESTION IS: WHAT ROLE WILL YOU PLAY?

HERE ARE SOME THINGS I CAN SHARE WITH MY FRIENDS TO HELP SLOW DOWN CLIMATE CHANGE

DOWN

1 Too many greenhouse gases is like piling many ..... on earth in the hot sun.

3 I will remember that the ..... effect is natural, but too much of it causes climate change.

4 I will learn about the invisible ..... in our air that trap heat & keep Earth warm.

7 I will celebrate clean ..... power that never runs out and is a gift from the sun!

AGROSS

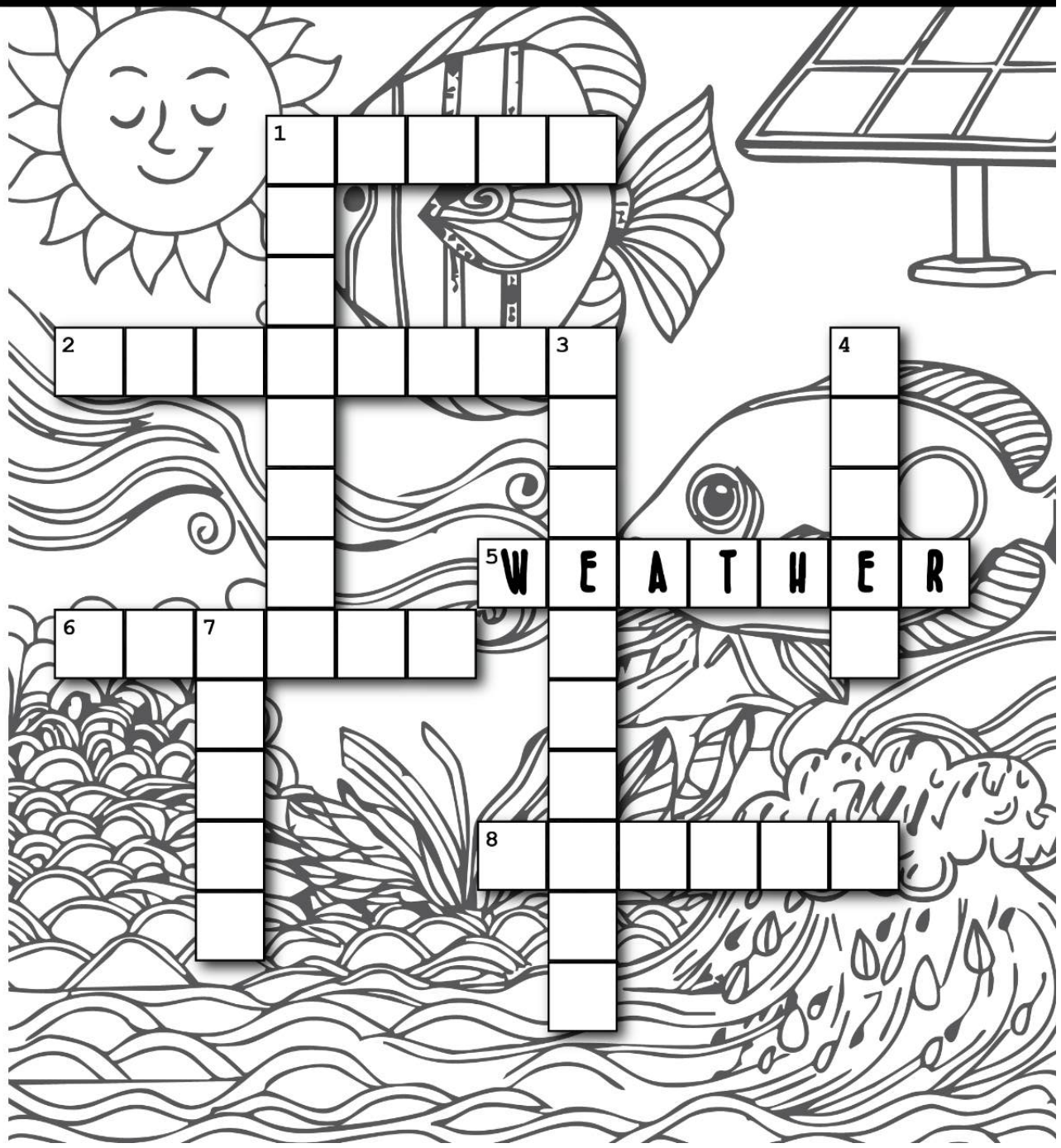
1 I will make sure no one ..... trash so less toxic smoke goes into the air.

2 I will join tree ..... projects so trees can absorb more carbon and cool the air.

5 I will pay attention to extreme **weather** events like storms, droughts, and floods caused by climate change.

6 I will reduce my energy use so less ..... fuels are needed for electricity.

8 I will remind others that the choices we ..... make affect the whole planet.



TELL A STORY ABOUT A CLEANER, GREENER FUTURE FOR US ALL!

HERE ARE SOME FACTS FOR YOU TO USE FOR REFERENCE...

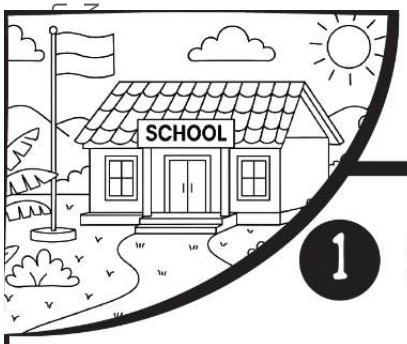
- BURNING FOSSIL FUELS LIKE COAL, OIL, & GAS RELEASES GREENHOUSE GASES THAT CAUSE CLIMATE CHANGE.
- RENEWABLE ENERGY SOURCES, FOR EXAMPLE: SOLAR, WIND, HYDRO, GEOTHERMAL, BIOMASS, DON'T RUN OUT. THEY ALSO DON'T CAUSE MUCH CARBON EMISSIONS.
- ENERGY EFFICIENCY MEANS USING LESS ENERGY.
- FOSSIL FUELS ARE THE MAIN THING WE USE TO MAKE ELECTRICITY. THIS CAUSES A LOT OF POLLUTION.
- BURNING COAL AND OIL CREATES SMOKE AND AIR POLLUTION THAT HARMS BOTH OUR AND THE PLANET'S HEALTH.
- SOLAR ENERGY WHICH USES SOLAR PANELS TO CAPTURE ENERGY FROM THE SUN IS A GREAT RENEWABLE OPTION.
- CLEAN ENERGY IS USED IN SMART, GREEN CITIES.
- TRANSITIONING TO RENEWABLE ENERGY SOURCES IS ONE OF THE WAYS TO CREATE NEW 'GREEN' JOBS.
- SAVING WATER ALSO HELPS TO REDUCE CARBON EMISSIONS BECAUSE YOU NEED LESS PUMPING & WASTEWATER TREATMENT.



CLIMATE CHANGE IS MAINLY CAUSED BY BURNING FOSSIL FUELS. BURNING FOSSIL FUELS LIKE COAL, OIL, AND GAS RELEASE _____ GASES INTO THE AIR, WHICH TRAP HEAT & MAKE THE EARTH HOTTER. RIGHT NOW, MOST OF OUR _____ COMES FROM COAL, OIL, AND GAS. THESE FUELS CREATE SMOKE AND _____ THAT HARMS OUR HEALTH.

BUT WE HAVE BETTER OPTIONS! _____ ENERGY FROM THE _____, WIND, AND OTHER _____ SOURCES WON'T RUN OUT. IT'S CLEAN, SAFE, AND PRODUCES ALMOST NO GREENHOUSE GASES. WE CAN ALSO PRACTICE ENERGY _____ (USING LESS ENERGY), WHICH SAVES MONEY AND REDUCES CARBON _____.

IN THE FUTURE, SMART CITIES WILL RUN ON CLEAN_____, AND AS COUNTRIES SWITCH TO RENEWABLES, NEW GREEN_____ WILL BE AVAILABLE FOR YOUNG PEOPLE LIKE ME!



ENERGY AUDIT FOR OUR SCHOOL

1 SEARCH FOR THE FOLLOWING THINGS AND NOTE WHAT YOU FOUND...

THINGS WE NOTED DURING OUR ENERGY AUDIT...		DETAIL NOTES... HOW MUCH? WHERE DID YOU FIND IT?
ANY LIGHTS LEFT ON IN UNUSED / EMPTY ROOMS?	☐ NO ☐ YES	
INEFFICIENT BULBS (I.E. NOT ENERGY SAVING LEDS)?	☐ NO ☐ YES	
AIR CONDITIONING ON BUT WINDOWS/DOORS OPEN?	☐ NO ☐ YES	
COMPUTERS/OTHER EQUIPTMENT STILL ON AFTER CLASS?	☐ NO ☐ YES	
ENOUGH TREES TO SHADE ALL THE WINDOWS WELL?	☐ NO ☐ YES	
ANY STUDENTS OR TEACHERS USING SUSTAINABLE TRANSPORT?	☐ NO ☐ YES	



BY HELPING SAVE ENERGY WE ARE ALL HELPING THE EARTH. WE ALL MAKE A DIFFERENCE!

3 DRAW A PICTURE OF THE LOCATION(S) WHERE YOU DID YOUR ENERGY AUDIT...

2 YOUR IDEAS ON HOW YOUR SCHOOL CAN SAVE MORE ENERGY...



WE CAN CHANGE ALL THE BULBS IN THE MATH LAB ROOM TO ENERGY EFFICIENT LEDS



ENERGY AUDIT FOR MY HOME

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FAMILY USING MOTORBIKE OR CAR WHEN THEY COULD EASILY WALK?	☐ NO ☐ YES	



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DRAW A QUICK SKETCH OF ONE CHANGE YOUR SCHOOL OR HOME CAN MAKE TO SAVE ENERGY. LABEL YOUR DRAWING.

4 CREATIVE CHALLENGE 2

WRITE A SHORT PLEDGE: FOR EXAMPLE... ONE THING I WILL DO TO HELP REDUCE ENERGY WASTE IS...

MY NAME IS:

This Handbook is part of the
'Building a Climate-Resilient Generation'
educational series, prepared for:

NUSANTARA
Capital City of Indonesia

Nusantara Capital Authority
Nusantara Capital Authority Office,
Nusantara Capital City, Kalimantan,
INDONESIA

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