Lembar Kerja Peserta Didik

LKPD

GLOBAL WARMING

KELAS VII SEMESTER GENAP

KELOMPOK

Nama Anggota

1.
2.
3.
4.





LIVEWORKSHEETS

Learning Outcomes

Students identify interactions between living things and their environment, and can design efforts to prevent and overcome pollution and climate change. Students identify the inheritance of traits and the application of biotechnology in everyday life.

Learning Objectives

After following this lesson, students are expected to be able to:

1. Identify the effect of vegetation (plants) on changes in environmental temperature
2. Design a model of the role of vegetation to prevent the impact of climate change in a sustainable manner
3. Be able to determine one way to prevent global warming

Pancasila Student Profile

1. Think Critically
2. Work Together

Understanding

1. Students work in groups to consolidate the concept of understanding together
2. Students can learn to manage time in carrying out practicums
3. Students are able to work together, apply a family attitude and work together in carrying out experiments
4. Students can investigate environmental conditions that show the greenhouse effect

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Learning Activities

Learning Activity 2 (3 JP = 120 minutes)

Introduction

1. The teacher opens the learning activity by saying hello and praying
2. The teacher takes attendance by linking the material that has been studied previously
3. The teacher attracts students to think about the climatic conditions of the surrounding environment

Core Activities

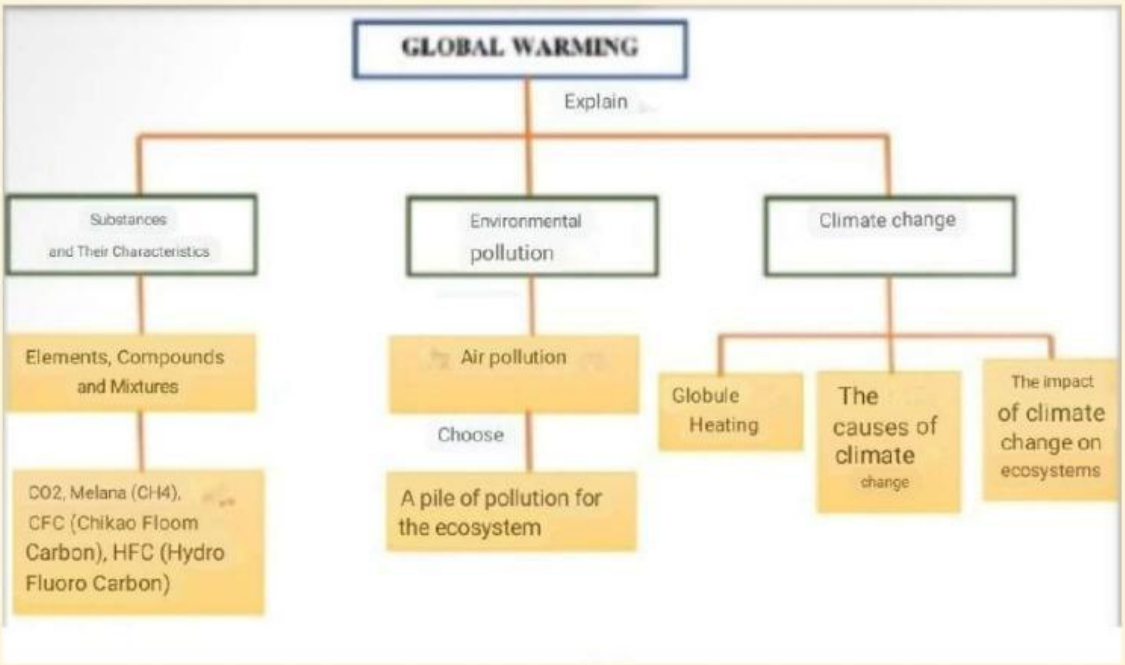
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Closing

1. Each student can conclude what they have learned in this dance lesson
2. Teachers are required to give appreciation to everyone's performance students, for example in the form of praise or appreciation if appropriate
3. The teacher is required to ask questions about today's learning, to evaluate the next activity
4. The teacher closes the lesson with prayer and greeting

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Map Material



Working Instructions

1. Read a prayer before starting the activity
2. Carry out experiments according to the LKPD given in groups with honesty and cooperation, as well as discipline in every step
3. Do it carefully, carefully, and respect the opinions of your group
4. Do the steps in sequence
5. Processing time is 60 minutes
6. Ask the teacher for help if you have difficulty understanding the LKPD instructions and activities
7. Present the results in front of the class confidently
8. When finished, collect the results of the LKPD accompanied by answers to the teacher

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LKPD 2

Global Warming

(Case on the Role of Vegetation in Reducing Global Warming)

Activity 1

Read the passage below carefully.



Picture 1. Consequences of Climate Change amd Global Warming

Arizona Greenland is now reaching a tipping point, where the ice sheet in the area is melting four times faster than 15 years ago. This is because global warming is increasing every year (Liputan 6, 2019). Gases such as water vapor, carbon dioxide, methane, chlorofluoro carbon, tropospheric ozone, create greenhouses by trapping heat near the earth's surface, the concentration of a number of these gases in the atmosphere is increasing. As a result of this increase, these gases are expected to capture more energy from the earth's surface in the lower layers of the atmosphere, which will lead to temperature increases and other changes in the global climate that are not predicted.

The heat radiation coming from the sun towards the earth can be compared to penetrating a greenhouse. Not all of this radiation is absorbed by the earth. However, there is radiation that is reflected into outer space. The reflected radiation is called infrared radiation. However, some of this infrared radiation is blocked by CO2 gas, clouds and other gases, causing the earth's temperature to increase. If the increase in temperature occurs repeatedly, the surface of the earth will experience an extreme increase in temperature which will cause the temperature on earth to be very hot. But when there are lots of plants, why does the air temperature become cool? How do plants affect temperature changes on earth? In this investigation, modeling is focused on the case of the role of deep vegetationreduce global warming.

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LKPD 2

Global Warming

(Case on the Role of Vegetation in Reducing Global Warming)

Formulation of the Problem

Try to think of a suitable problem formulation to prove this truth!

1. How to model the role of vegetation inreduce global warming?
2. How do vegetation affect temperature changes on earth?

Hypothesis

The more vegetation, the lower the temperature and the less vegetation, the higher the temperature.

Experimental Variables

Before carrying out an experiment, first try to determine and complete the following variables.

Manipulated Variable	: Plants
Variable Operational Definition	: In container A there is vegetation (plants) and in container B there is no vegetation (plants)
Control Variables	: Type of thermometer, type of mica, and heating time interval
Variable Operational Definition	: Using a stick thermometer/alcohol thermometer, the same type of clear mica, size F4, and time intervals of 5, 10, 15 and 20 minutes
Response Variable	: Change in temperature
Operational Definition Variable	: Change in temperature in containers A and B every time interval

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LKPD 2

Global Warming

(Case on the Role of Vegetation in Reducing Global Warming)

Tools and Materials

Tools		Materials	
– Thermometers	2 pieces	– Clear mika	3 pieces
– Statives and Clamps	2 pieces	– Plant	1 piece
– Stopwatch	1 piece	– Masking tape	1 piece
– Scissors	1 piece		
– Cutter	1 piece		

Warning!
Be careful when using the thermometer because it can break easily.

Work Steps

1. Prepare tools and materials
2. Make the mica circular like a jar
3. Wrap the plant in a circle with clear mica
4. Divide one of the mica into 2 parts with scissors into a square shape
5. Cut a small part for the cover using a cutter, at least enough to insert a thermometer
6. Cover the top of the mica containing the plants with the mica
7. Install the thermometer on the stand and insert the bottom into the container through the square mica hole that has been previously punched
8. Repeat steps 2–7 but do not provide vegetation/plants
9. Label the mica with the letter A (container containing plants) and with the letter B (container not containing plants)
10. Place container A and container B in the sun
11. Measure and record the initial temperature in each container (make sure the temperature is the same)
12. Observe and record the temperature in container A and container B every 5 minutes for 20 minutes
13. Record the data in the experimental results table

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LKPD 2

Global Warming

(Case on the Role of Vegetation in Reducing Global Warming)

Experimental Result Data

Table 1.Observation Results of the Role of Vegetation in Reducing Global Warming

Condition	Initial temperature	Temperature changes in the minute-			
		5	10	15	20
Container A (Contains plants)	37°	38°	39°	40°	40°
Container B (Without plants)	37°	39°	41°	42°	42°

Data Analysis

Carry out data analysis based on the experimental data that you have obtained!

Based on the observation table above, it can be seen that the initial temperature of container A and jar B was the same, namely 37°C. After 5 minutes of being placed under sunlight, the temperature in container A increased to 38°C, and the temperature in container B increased to 39°C. After 10 minutes, the temperature in container A increased to 39°C, and the temperature in container B increased to 41°C. After 15 minutes, the temperature in container A increased to 40 °C and in container B increased to 42°C. After 20 minutes, the final temperature of container A is 40°C while container B is 42°C.

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Global Warming

(Case on the Role of Vegetation in Reducing Global Warming)

Questions

Based on the results of the analysis, answer the following questions:

1. What do you know about the greenhouse effect?
   Answer:
   The greenhouse effect is a term used to describe the earth as having a greenhouse effect where the sun's heat is trapped by gases in the earth's atmosphere.

2. Which container shows the greatest change in temperature?
   Answer:
   Container B

3. What caused the change?
   Answer:
   This is because mica B does not have plants.

4. Does the presence of vegetation and the number of plants influence temperature changes? Why is that? Explain!
   Answer:
   Yes, it affects. The more plants there are, the lower the temperature will be. This is because plants absorb CO2 which is used as a substrate for photosynthesis. When CO2 is absorbed, CO2 is reduced and causes the sun's heat to not be retained and can be reflected outward so that the increase in temperature that occurs in the media becomes smaller.

5. What efforts can be made to overcome global warming based on the experiments that have been carried out?
   Answer:
   Planting trees as an effort to overcome global warming.

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LKPD 2

Global Warming

(Case on the Role of Vegetation in Reducing Global Warming)

Conclusion

The conclusions that can be drawn from this experiment are:

Based on data from observations that have been made, it can be concluded that the presence of vegetation influences global warming events. The more vegetation, the lower the temperature and vice versa, if there is less vegetation, the temperature will be higher.

Enrichment

1. What if the mica colors are made differently? Will it affect temperature changes?
   Answer:
   If the color of the mica changes, it will affect the increase in temperature. When the color of mica gets darker, the temperature changes that occur also get bigger because the dark color absorbs light.
2. What if both containers A and B contain plants, but in container A the plants are thicker and in container B there are fewer plants
   Answer:
   The temperature in container A will be lower than the temperature in container B, because the number of plants affects the amount of carbon absorbed by the plants and the oxygen produced will be greater in lush plants.

References

Haryanti Harsono, Fitri. 2019. *Greenland is Melting 4 Times Faster Than 15 Years Ago*. Jakarta: Liputan6.com.

Rutherford, F.J., & Ahlgren, A. 1990. *Science for All Americans*. New York: Oxford University Press.

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Documentation



Picture 1. Prepare tools and materials



Picture 2. Wrap the plant in clear mica in a circle like a jar



Picture 3. Divide one of the mica into 2 parts with scissors into a square shape and then make a hole



Picture 4. Cover the top of the mica containing the plant with the mica



Picture 5. Install the thermometer on the stand and insert the bottom into the container through the square mica hole that has been previously punched



Picture 6. Label mica with the letter A (container containing plants)

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Documentation



Picture 7. Make the mica circular like a jar, but without vegetation/plants



Picture 8. Cover the top of the mica without plants with mica which has been divided into 2 parts



Picture 9. Install the thermometer on the stand and insert the bottom into the container through the square mica hole that has been previously punched



Picture 6. Label mica with the letter A (container containing plants)



Picture 11. Observe and record the temperature in container A and B every 5 minutes for 20 minutes



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