Vision Empower & XRCVC

Teacher Instruction KIT

Air

Syllabus: Karnataka State Board
Subject: Environmental Studies
Grade: 5
Textbook Name: Environmental Studies- Text cum work book-English medium- Fifth standard
Chapter Number & Name: 6. Air

1. OVERVIEW

1.1. OBJECTIVE & PREREQUISITES

Objective

- To know about the existence of air through experiments.
- To know the components of air and understand some characteristics of air through experiments.
- To understand the uses of air.
- To discuss air pollution, causes and effects and remedies.

Prerequisite Concept

- Air- EVS, Grade 4, Chapter : 24 Journey of the Cloud

Content Index

*Kindly Note: Activities marked with * are mandatory*

Activity 4: Air moves

Activity 5: Air exerts pressure

Air Pollution

Activity 6: Air pollution

3.3. LET'S DISCUSS: RELATE TO DAILY LIFE*

4. EXERCISES & REINFORCEMENT

4.1 EXERCISES & REINFORCEMENT

Measure to prevent air pollution

Activity 7: Measure to prevent air pollution

4.2 IMPORTANT GUIDELINES*

Exercise Reading

Perform Textbook Activity

Provide Homework

2. LEARN

2.1 KEY POINTS

Air is the mixture of gases that makes up the Earth's atmosphere.

Compos*i*tion of air: The air in our atmosphere is composed of molecules of different gases such as nitrogen (78%), oxygen (21%) carbon dioxide (0.04%) water vapour, noble gases and dust particles. (0.96%). Show and explain the accompanying tactile pie-chart to children.

Properties of Air:

- Air is made up of gases
- Air occupies space
- Air has mass
- Air exerts pressure and has weight
- Air can be compressed
- Air is impacted by temperature

Uses of air:

- Living beings need oxygen (which is contained in air) to live.
- Air is required for burning.
- Air is a vital agent in the water cycle.
- Air is used to generate electricity
- Air is required for photosynthesis

Air Pollution: Air pollution occurs when gases, dust particles, fumes (or smoke) or odour are introduced into the atmosphere in a way that makes it harmful to humans, animals and plants. This is because the air becomes dirty (contaminated or unclean).

Pollutants: Things that pollute the air are called pollutants.
Causes of Air Pollution
1. Industrial Emissions: Factories release toxic chemical compounds into the air during manufacturing processes that cause air pollution. Dangerous fumes like smoke and smog alongside big and small particulates are released by them as well.
2. Fossil Fuels: Fossil fuels such as petroleum and coal burn when you regularly use automobiles like cars, bikes, and buses. These release fumes in the air, thus causing air pollution.
3. Natural Sources: From volcanic eruptions to dust storms and pollen distribution in the air, when nature wreaks havoc, you have particulate matter being released into the air, thus contaminating it.
4. Paints and Chemical-based Products: Paints from dried walls leak chemicals to the atmosphere over time which causes air pollution. This also includes household products such as detergents, cleaners, and sprays.
5. Acid Rain: This causes air pollution and results from toxic substances like sulphuric acid turning into clouds by combining with atmospheric moisture. When these clouds rain, the water droplets are acidic in nature and damage plant life and vegetation.

2.2 LEARN MORE
https://eschooltoday.com/pollution/air-pollution/what-is-air-pollution.html
https://parenting.firstcry.com/articles/must-know-air-pollution-information-and-facts-for-kids/

3. ENGAGE

3.1. INTEREST GENERATION ACTIVITY

Air around us

Activity 1: Air around us
Materials Required: None
Prerequisites: None

Activity Flow

- Ask the students what they think air is and what they know about air. Make the students fan themselves with a sheet of paper or a book. (Show them how to do this using the hand over hand technique if they are not aware of how to do so.)

- Ask the students to recall instances of travelling in vehicles with the windows down.
- Make the students take deep breaths. If possible take them to a garden/ park and make them take deep breaths there in addition to making them take deep breaths in a classroom.

3.2. CONCEPT INTRODUCTION ACTIVITIES

Characteristics of Air

Activity 2: Air occupies space

Materials Required: a water bottle, a balloon
Prerequisites: None

Activity Flow

- Push a deflated balloon into a bottle and stretch the open end of the balloon back over the bottle's mouth.
- Have the students guess what will happen to the balloon if you were to try to inflate it inside the bottle. Will the balloon break the bottle, pop or do nothing?
- Try to blow up the balloon.
- After the experiment, discuss why the balloon did nothing. This is because air takes up space, the bottle was full of air. When you try to blow up the balloon, the air trapped inside the bottle prevents the balloon from inflating. Make the point that even though air is invisible, it still takes up space.

Or

Materials Required: a clear bowl full of water, 2 glasses or cups, pieces of paper.
Prerequisites: None

Activity Flow

- First, fill the bowl with water.
- Next, get the first plastic cup without the hole. Crumple some pieces of paper and put it snug at the bottom of the cup.
- Put the cup into the water upside down. Leave it in the bowl for 30 seconds or so. You will need to push it with your hand to keep it in place or else the cup will float back up.
- After 30 seconds, slowly take the cup out of the water without tilting it.
- Once fully out of the water, take the paper out. What's happened to the paper? Is it dry or wet?
- Now let's proceed to the next step. This time, we're going to use the cup with a hole in the bottom.

- Do exactly the same thing. Crumple some pieces of paper and push it tight at the bottom of the cup.
- Next, submerge the cup upside down into the water. Hold it for 30 seconds and pull it out without tilting. What has happened now? Why is this paper wet?
- Explain to the children that in the first experiment, the paper at the bottom of the cup was completely dry because the air molecules that were already in the cup occupied the space inside the cup. Therefore, the water could not fill the cup completely and reach the paper at the bottom of the cup. In the second part of the experiment, since the cup has holes, the air could now easily escape out of the cup. So when you submerged it, all that air molecules went running out of the hole and the water was happy to occupy the space that the air had escaped from.

Activity 3: Air has mass
Materials Required: 2 inflated balloons, a stick
Prerequisites: None

Activity Flow
- Inflate the two balloons until they are equal in size and tie them off.
- Attach a piece of string to each balloon.
- Then, attach the other end of each of the strings to the opposite ends of the meter stick, keeping the balloons the same distance from the end. The balloons will now be able to dangle below the ruler.
- Tie the third string to the middle of the meter stick and hang it from the edge of a table or support rod. Adjust the middle string until you find the balance point where the meter stick is parallel to the floor.
- Ask the children to predict or make a hypothesis about what will happen if you were to poke a hole in one balloon.
- Poke a hole in one of the balloons. Encourage the children to explore what has happened.
- Explain to the children that the balloon that remains full of air will cause the ruler to tip showing that the air has weight. The empty balloon's air escapes into the surrounding room and is no longer contained within the balloon. The compressed air in the balloon has a greater weight than the surrounding air.

Activity 4: Air moves
Materials Required: None
Prerequisites: None

Activity Flow

- Direct an electric fan towards the students and turn it on.
- Ask the students what they felt when they were in front of the fan.
- After their responses, explain that what they were feeling was air moving very fast. Explain how the fan makes air move very fast.

Activity 5: Air exerts pressure
Materials Required: a few pieces of paper
Prerequisites: None

Activity Flow
- Take the students to a place where there is plenty of room to run such as a hall or a playground. Make sure the space is free of obstacles so that the children can run freely.
- Hand out pieces of paper to the students.
- Ask the class what they think will happen to a piece of paper if they put it against their stomach while walking forward without holding the paper in place.
- Instruct students to hold the piece of paper against their stomach. Ask the students to let go of the paper when they begin to walk forward (The paper should fall to the ground.)
- Now ask the students to put the paper against their stomach and run in a straight line without holding the paper in place. Make them do this one at a time.
- What happens now? (The paper should stay in place.)
- Afterwards, explain that the force holding the paper in place when the student ran was air. Make the point that even though air is invisible, it exerts pressure. When you run, the air pushes against you, working to hold the piece of paper against your body. While walking, the paper did not stay in place because the air was not pushing very hard against your body.

Air Pollution

Activity 6: Air pollution
Materials Required: incense stick
Prerequisites: None

Activity Flow
- When teaching air pollution, ask the students to place their hand just above a lit incense stick (or a lit small candle). When making the student sense smoke using an incense stick or candle, hold the student's hand at a height so that they do not burn their hand.
- It causes serious health issues like heart disease, cancer, breathing problems etc., It has a negative impact on growth of plants and their yield.

- When discussing specific examples of air pollution like its effect on the Taj Mahal, give the student a model of the Taj Mahal, describing it in detail as well.

3.3. LET'S DISCUSS: RELATE TO DAILY LIFE*

- Air around us
- Breeze and winds.
- Air aids the movement of kites, planes, gliders, parachutes, helicopters, etc

4. EXERCISES & REINFORCEMENT

4.1 EXERCISES & REINFORCEMENT

Measure to prevent air pollution

Activity 7: Measure to prevent air pollution

Materials Required: None

Prerequisites: air pollution

Activity Flow

- Let the students discuss in their groups about what measure can be taken to prevent air pollution.

4.2 IMPORTANT GUIDELINES*

Exercise Reading

It is very important that the children practice their learnings as well as their reading. Hence have the children read out the newly learned concepts from their textbooks or other available resources.

Perform Textbook Activity

It is good practice to have the children perform the textbook activities. Your textbook activities might not be accessible hence go through this resource to learn how to make textbook content accessible

Provide Homework

To evaluate their understanding and to help the student revise and implement the new learnt concept ensure to provide them with homework. Students should perform one or two of the questions mentioned above or from the textbook exercises with the teacher in

Class and the remaining may be given for homework. Also, ensure that the student knows their special skills linked to independently using their accessible books as it will be critical to doing homework independently

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