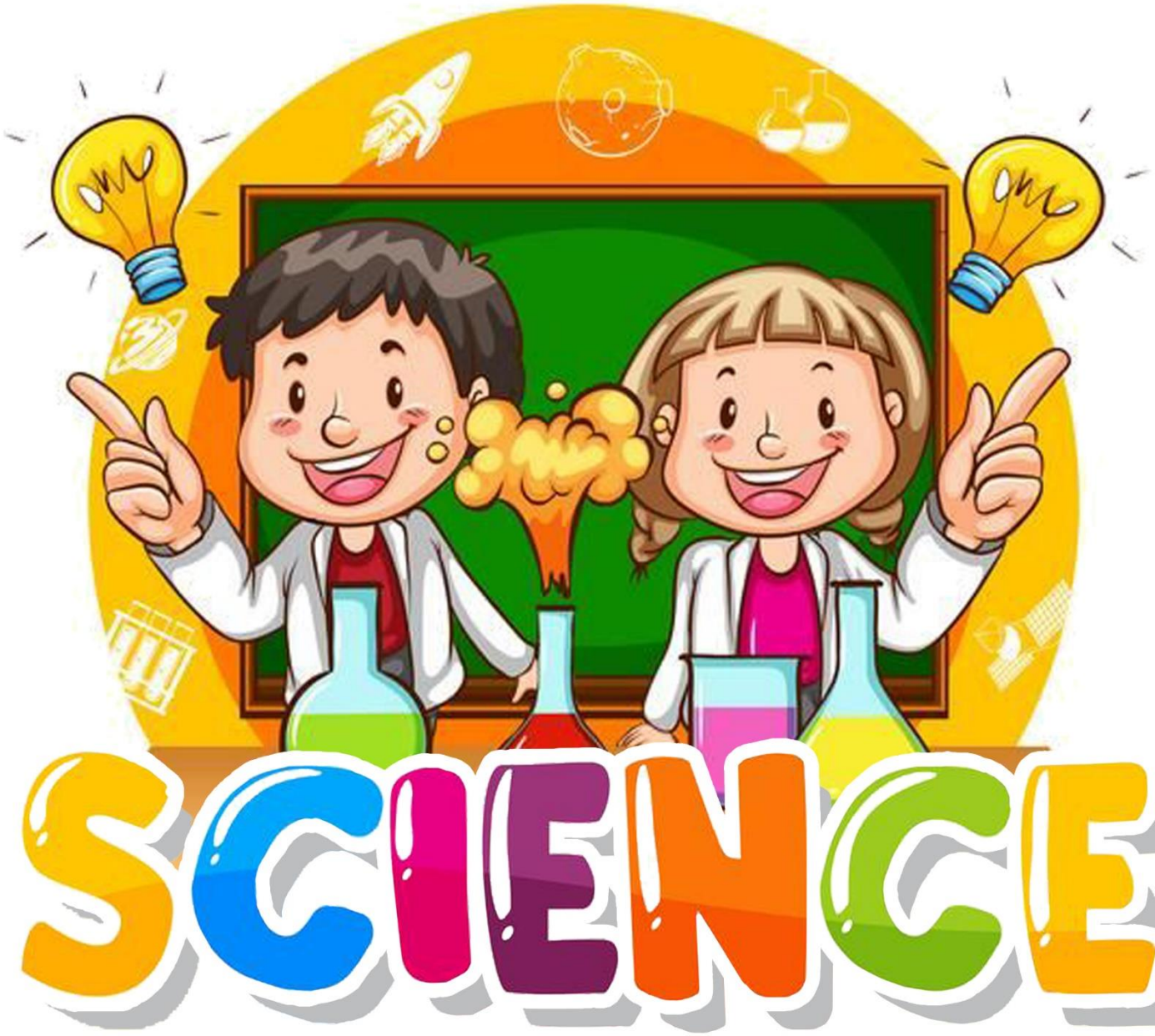
Grade 7



Self-Study Learning Kit- Generation of Electricity

Subject - Science

Grade - 7

Term - First Term

Unit - Generation of electricity

Learning Outcomes -

- Documents various chemical cells.
- The solar cell is identified as an electrical source.
- States that the principle of the dynamo it is electromagnetic induction.
- Creates a simple cell to generate electricity.
- Performs simple operations using solar cells.
- Declares that the electric current exists as direct current D.C and alternating current A.C

Activity 1

Materials Needed - Bicycle Dynamo, Car Battery, Button Cell, Dry Cell, Small Solar Panel

Observe these devices closely.

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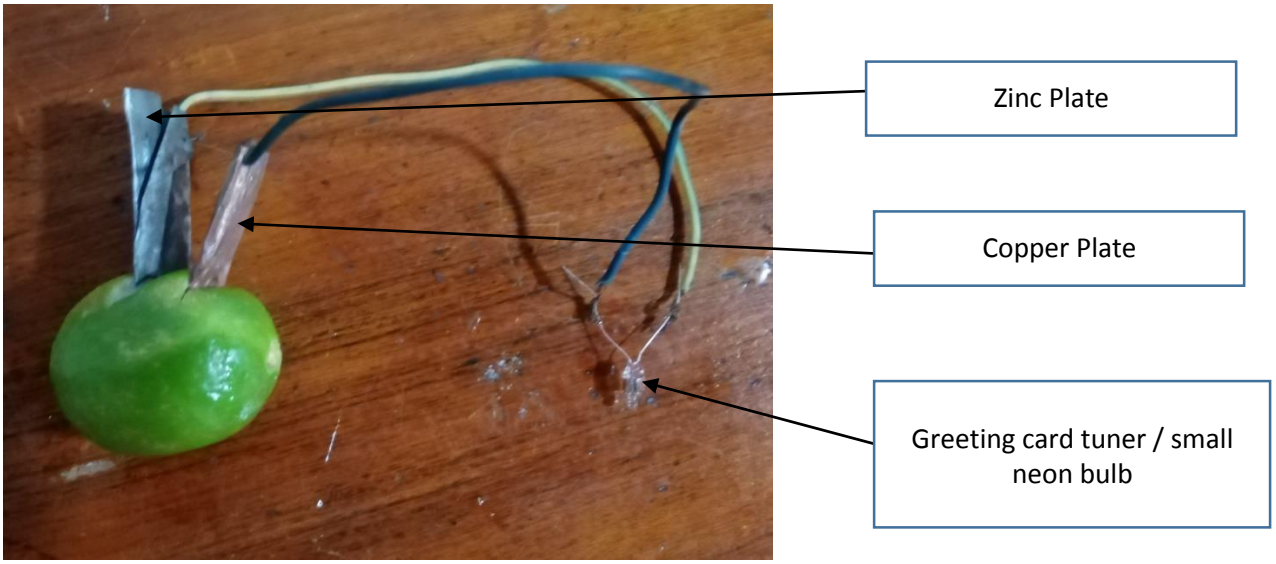
For your Knowledge - The devices that produce electricity are called electrical sources. Some of the electronic sources are shown above.

Let's classify electricity according to how it is generated.

Source of Electricity	Method of electricity generation
Bicycle dynamo	By moving
Car battery	By chemical energy
Button Cell	By chemical energy
Dry Cell	By chemical energy
Small solar panels	By Solar energy

Activity 2

Materials Needed - Zinc plate extracted from a dry cell, a copper plate, a well-ripened lime, a greeting card tuner / small neon bulb



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- Clean the two plates thoroughly.
- Crush the lime well so that it does not crack.
- Mount the two plates close to each other as shown in the diagram.
- Connect this to greeting card tuner using two pieces of wires

Note down observations

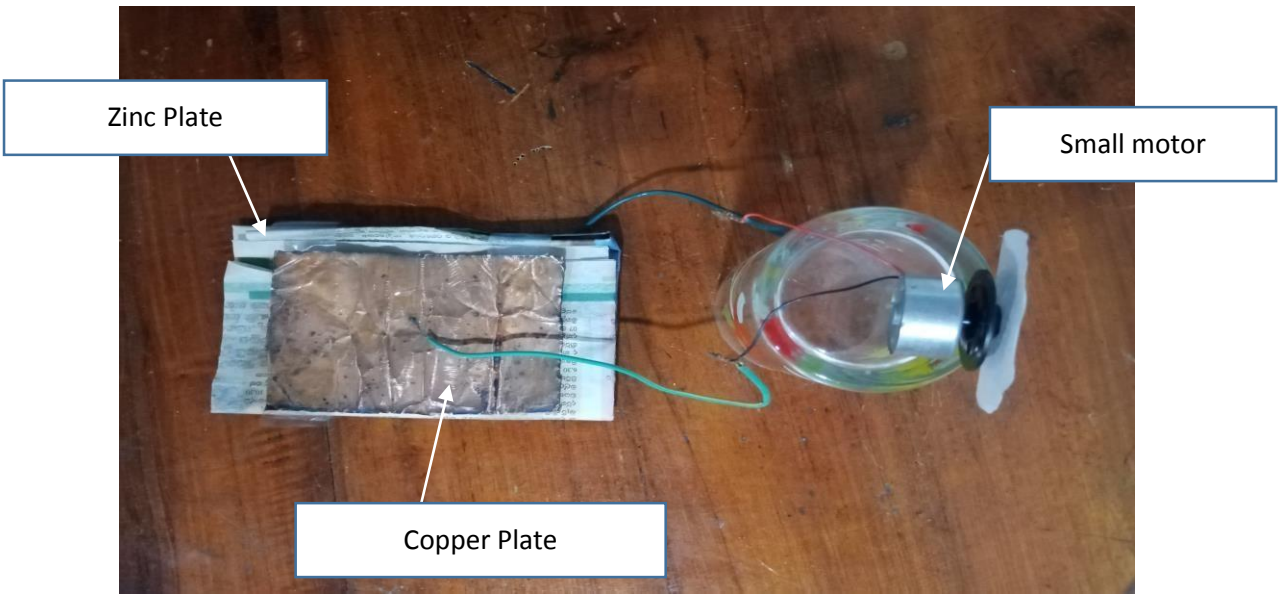
……

……

For your knowledge – This is a cell which generates electricity through a chemical process. Copper plate act as the positive (+) terminal and Zinc plate as the negative (-) terminal.

Activity 3

Material Required - Two zinc and copper plates of size 10 cm, 10 cm. A piece of paper folded over several times and larger than two plates, vinegar, two pieces of wires, small DVD motor



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Thoroughly clean two plates and place the piece of folded paper soaked in vinegar in between two plates. Fix the two plates tightly (plates should not touch each other)

Then connect it to the motor using wires. Record observations.

……

……

For your knowledge - This is a cell that generates electricity through a chemical process. The copper plate acts as the positive (+) terminal and the zinc plate as the negative (-) terminal.

Activity 4

Get a bike equipped with a dynamo. Rotate the wheel connected to the bicycle dynamo fast. Observe the bulb connected to the dynamo.

For your knowledge - The bicycle dynamo is a device that generates electricity from motion. When the dynamo's head rotates rapidly, the associated magnet rotates rapidly. When the conductor and magnetic field lines collide, electricity is generated in the conductor. This is called electromagnetic induction.

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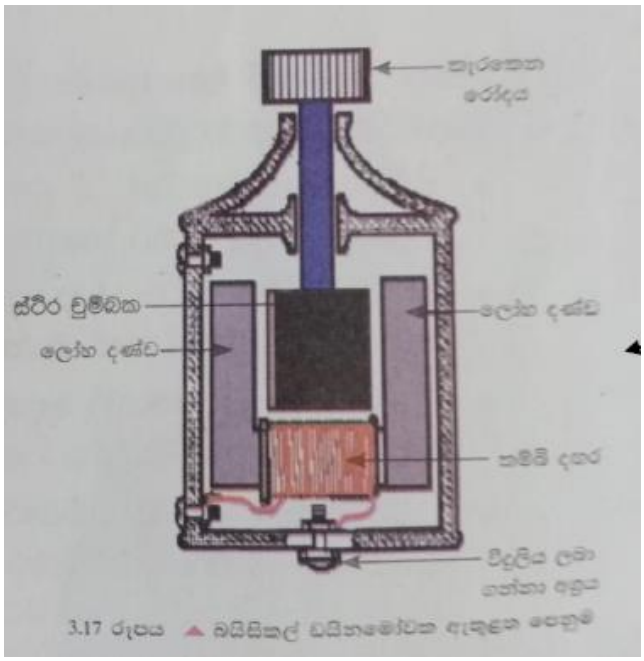

Activity 5

Take an equipment with a solar panel. Expose it to the sunlight and observe how it operates.

For your knowledge –

Solar panel is an equipment which produces electricity using the solar energy from the sun. It is made by connecting a several number of solar cells in a definite order.

Here, solar energy is converted to electricity.

Solar energy ⟶ Electric energy

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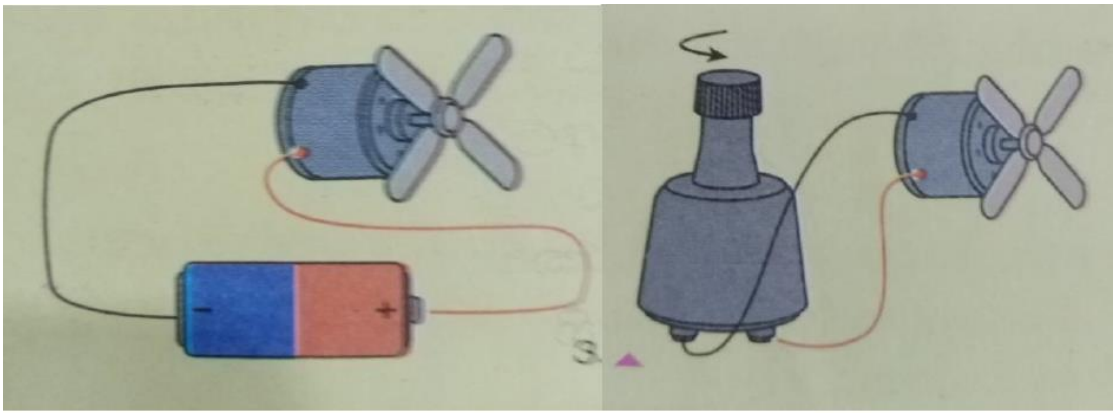
Activity 6

Required materials: a dry cell, a small motor, bicycle dynamo, a wind propeller made from cardboards



1st diagram

2nd diagram

Operate this equipment. Connect the wind propeller to the sources of electricity you used in the 1st activity and record the observations.

Observations: ……

For your knowledge –

During the 1st instance wind propeller rotates to one direction only. That means, current has flown to one direction only. The current that flows to one direction only is known as direct current. (D.C.)

During the 2nd instance, wind propeller vibrates to sideways. That means when the dynamo rotates the direction of the current flow changes alternatively. If the direction of current flow changes alternatively, such current flow is known as alternative current (A.C.)

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Recall the sources of electricity you used in the above activities. Let's categorize them as below.

Sources of electricity that gives DC	**Sources of electricity that gives AC**

Evaluation

1). Write the suitable word in front of the source of electricity considering method of generation of electricity.

(Solar energy, by moving, chemical process,)

1. Dynamo - ……

2. Generator - ……

3. Button cell - …….

4. Alkali cells - …….

5. Car battery - …….

6. Cell made from lime - ……..

7. Simple cell - ……..

8. Solar cell - ……

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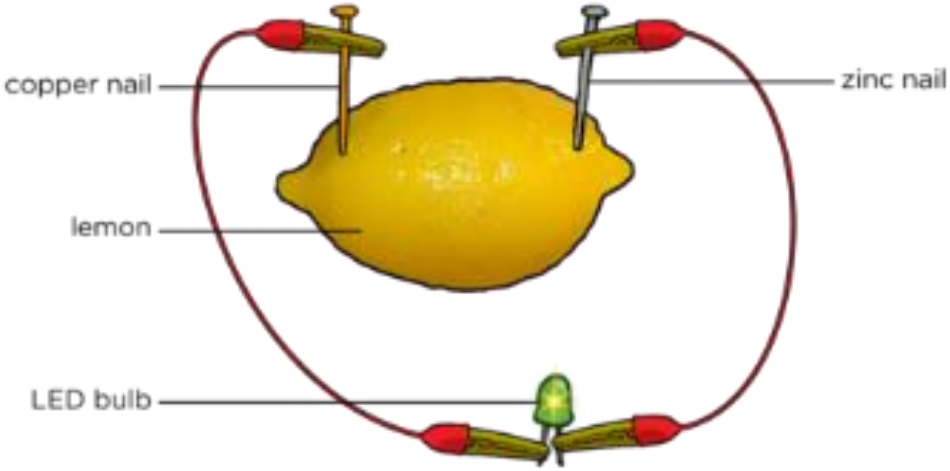
2). Recall the cell you made using limes in 2nd activity. Following is a figure of it. Answer the questions based on that



i. In which way electricity is produced here?

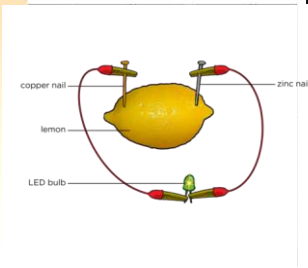
ii. Name the positive and negative terminals.

iii. Write two weaknesses of this type of cell.

iv. Write three other cells that will generate electricity by overcoming that issue.

3). Categorize the appliances that will supply AC and DC current based on the knowledge you gathered in doing 6th activity.

Bicycle dynamo, car battery, simple cell, dry cell, button cell, cell made from lime fruit, solar panel, Generator



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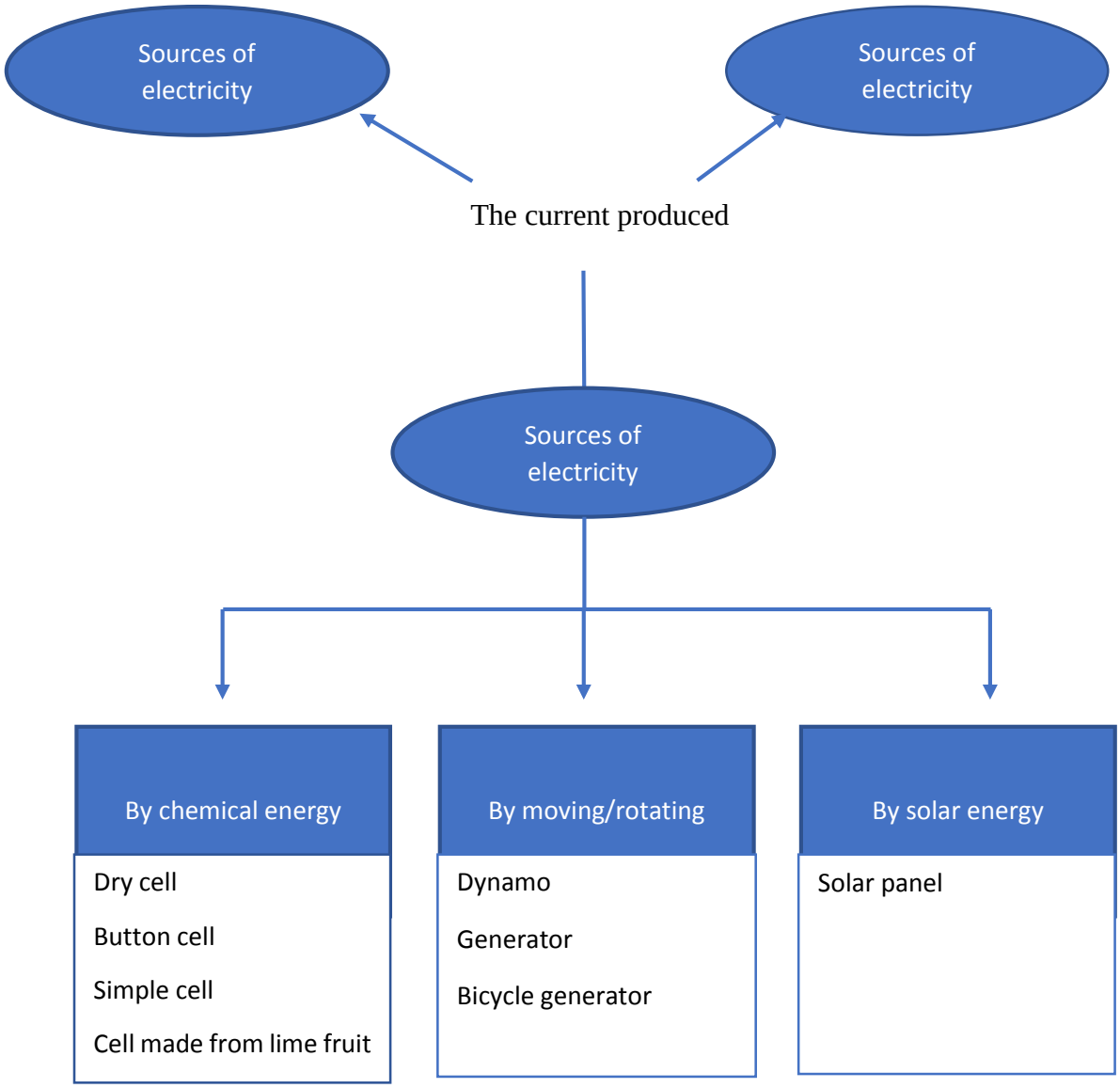
Source that will supply AC	Sources that will supply DC

Summary



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