

SECOND TERM WEEKLY LESSON NOTES

WEEK 9

Date: 8 th JULY, 2022	DAY:	Subject: Science
Duration:		Strand: Forces & Energy
Class: B7	Class Size:	Sub Strand: Energy
Content Standard: B7.4.1.2 Demonstrate an understanding of the concept of heat transfer and its applications in life	Indicator: B7.4.1.2.1 Explain and demonstrate how heat is transferred in various media	Lesson: 1 of 2
Performance Indicator: Learners can demonstrate how heat is transferred in various media		Core Competencies: DL 5.3: DL 5.1:CC 8.2: CC 8.5: CI 5.2: CI 6.2:CI 5.4:
References: Science Curriculum Pg. 28-29		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Using questions and answers, review learners understanding in the previous lesson. Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	Guide learners to explain how heat is transferred through different media (gas, plastic, metal, liquid). <u>Transfer of heat energy</u> When an object is heated, it becomes hot. The heat in it can be transferred from one place to another. This process is known as heat transfer. Heat transfer is the method by which heat energy moves through different media. There are three modes of heat transfer: 1. Conduction: Conduction is the transfer of heat energy through solids. 2. Convection: Convection is the transfer of heat energy through fluids (liquids and gases). 3. Radiation: Radiation is the transfer of heat energy through empty space(vacuum) Engage learners to carry out an activity to show how heat is transferred through different media. Have learners identify the materials needed for the experiment: <i>Example: metal objects (iron rod), retort stand, drawing pins, shea butter or candle wax, ruler, and Bunsen burner</i> Demonstrate the procedure to show how heat is transferred through different media 1. <i>Clamp the metal rod horizontally as shown in the diagram below.</i> 2. <i>Use melted candle wax or shear butter to attach the drawing pins at equal intervals on the rod.</i> 3. <i>Leave the wax or shear butter to cool.</i> 4. <i>Heat the other end of the rod with the Bunsen burner</i>	Solar panels, Torch light, cardboards, candle, etc

5. Observe and record the time taken for each of the drawing pins to fall off the rod.



Observation: It was observed that after sometime, the drawing pins begins to fall off from the rod. The pins closest to the heat source fell off first, because the heat reached the wax holding it first before the second and the third pin. This happens because the heated molecules gain energy and vibrate vigorously. They pass on the vibrations to molecules near them which result in the spread of heat through the solid. The particles of the solid do not move from one place to another.

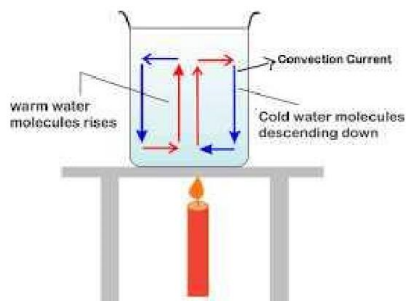
Conclusion: The fall off of the drawing pins shows that conduction has taken place as heat is being transferred from a region of high temperature to a region of lower temperature

Engage learners to experiment to demonstrate Convection In a Liquid.

Materials needed: Beaker, Water, tripod stand and Bunsen burner

Procedure:

1. Half-fill the beaker with water
2. Place the beaker on the tripod stand
3. Heat the beaker at the base and closely observe the movement of the convection current in the beaker.



Observation: From the figure above you can clearly see convection current. When the water was heated the molecules nearest to the source gain energy and move faster leading to fluid expansion. The heated molecules become lighter and moves upwards. As heated molecules of the water move upwards, the denser and colder molecules begin to move downwards. This means that the warm water rises and the colder molecules of water descend.

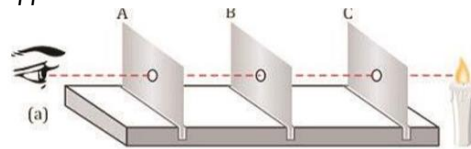
Conclusion: The upward and downward movements of the convection current shows that convection has taken place.

Guide learners to discuss how heat energy is transferred through a vacuum (empty space).

	<p><i>In radiation, heat is transmitted in a form of wave. It does not require any material medium. For example, if you bring your hand near a lighted candle, you feel the heat from the candle. The heat is not transferred to your hand by conduction, because air is a good insulator and does not conduct heat. The heat didn't reach the hands by convection, because convection occurs in fluids.</i></p> <p><u>Assessment</u></p> <p>I. With the aid of diagrams, state and explain the three modes of heat transfer.</p>	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

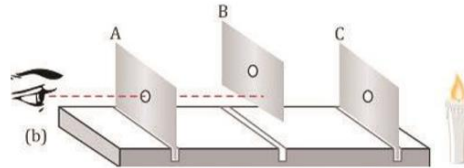
Date: 8 th JULY, 2022	DAY:	Subject: Science
Duration:		Strand: Forces & Energy
Class: B7	Class Size:	Sub Strand: Energy
Content Standard: B7.4.1.3 Demonstrate understanding of characteristics of light, such as travelling in a straight line, reflection, refraction and dispersion	Indicator: B7.4.1.3.1 Demonstrate how light travels in a straight line.	Lesson: 2 of 2
Performance Indicator: Learners can demonstrate how light travels in a straight line		Core Competencies: DL 5.3: DL 5.1:CC 8.2: CC 8.5: CI 5.2: CI 6.2:CI 5.4:
References: Science Curriculum Pg. 28-29		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Using questions and answers, review learners understanding in the previous lesson. Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	Revise with learners on light energy and its types. <i>Light Energy is a form of energy that makes vision possible.</i> <u>Types of light Energy</u> 1. Visible light: This light can only be seen through the naked eye. It is a form of electromagnetic energy. The source of visible light is the sun. It can also emit from lanterns, flashlight, light bulbs, etc. 2. Infrared light: This is a form of electromagnetic energy that produce heat. TV remotes use infrared light. They travel from the remote to the TV. 3. X ray and Ultraviolet light: They are short light waves used by doctors to capture images within our bodies and spot fractures in our bones. Also, dentist use x-ray to monitor the extent of the deterioration of the teeth. Guide learners to discuss the properties of light. i. Light travels in a straight line. ii. Light can be reflected from shiny surfaces. iii. Light traveling in straight line can bend as it moves through different media (refraction). iv. Light can be dispersed into different colors (dispersion). Engage learners to perform experiments to show that light travels in a straight line and can be reflected and refracted and produce reports, posters or diagrams. Procedure: 1. Arrange the three card boards A, B, and C with a hole in their centers in a straight line by passing a string: 2. Through the holes, as in diagram (a) below. 3. Remove the string.	Triangular prism, an arrow beam of light, a screen, cardboard, candle

4. Place the source of light behind the first cardboard. Observe what happens



In the diagram (a) above, the observer can see the candlelight through the holes made on the cardboards A, B and C.

6. Displace the cardboard B slightly so that the card boards are no longer in a straight line as in diagram (b) below.



When cardboard B is shifted, the observer can no longer see the candlelight as before.

Using diagrams, guide learners to explain what refraction of light is.

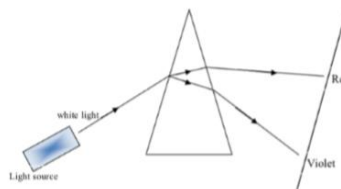
Engage learners to perform an experiment to show dispersion of light into colors.

Dispersion Of Light Dispersion is the separation of white light into its components colors when it passes through a medium (glass or water).

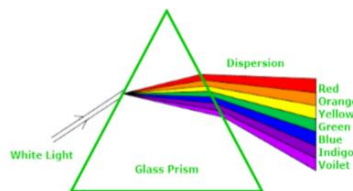
Materials needed: Triangular prism, an arrow beam of light, a screen

Procedure:

1. Set up the experiment as shown in the diagram below.
2. Switch on your light source
3. Regulate the position of the light source until a clear and sharp image of the components of light is seen on the screen.



White light is simply the light from the sun, stars, torchlight, and electric lamps. White light is made up of seven colours namely; red, orange, yellow, green, blue, indigo, and violet (ROYGBIV). These different colours forming white light can be seen in a rainbow or when a white light passes through a prism (a triangular block of glass or plastic).



NOTE:

	<ul style="list-style-type: none"> • <i>When the white colors pass through a prism, it is refracted or bent as it leaves the prism.</i> • <i>Each color of the spectrum of the white light is refracted at different amount due to the speed at which each color travels in a media (air, water and glass)</i> • <i>The color that refract most is violet and the color that refracts least is red</i> <p><u>Assessment</u></p> <ol style="list-style-type: none"> 1. Describe a simple experiment to demonstrate that light travels in a straight line. 2. Draw a labelled diagram to show dispersion of light through a triangular glass prism and explain what accounts for the position of the different colors. 3. Explain the difference between reflection, refraction, and dispersion. 4. Use a ray diagram to show the path of light travelling from air into water. 	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	