Lesson plan/note for week 4 ending, 3rd February, 2023

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| Term | 2nd term |
| Week | Week 4 |
| Date | 30th January/31st January/ 1st February, 2023 |
| Class | JSS 2 |
| Subject | Basic Science |
| Topic | Thermal Energy |
| Sub-topic | Methods of heat transfer |
| Period | 9th/7th/9th |
| Time | 2:00-2:30pm/12:30-1:00/2:00-2:30 |
| Duration | 30 minutes each |
| Number in class | Twelve |
| Average age | 12 years |
| Sex | Mixed |
| Specific Objectives | By the end of the lesson, the students should be able to:  1.Define thermal energy.  2.Explain heat flow  3.Define heat transfer.  4.Mention the methods of heat transfer. |
| Rationale | To enable students understand how heat flows from a hotter to a cooler environment, the methods of heat transfer as well as their applications. |
| Previous Knowledge | Students are familiar with heat. |
| Instructional resources | Hot water and a metal spoon. |
| Reference Materials | i.Excellence in Basic Science and Technology for JSS 2 by Olushola Felix Bello et al.  ii.Fundamentals of Basic Science for JSS 2 by Adebesin.O. Michael |

Lesson Development

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| Steps | Teacher’s Activities | Students’ Activities | Learning Points |
| Introduction | Teacher asks students what they feel when they touch a cup of hot water | Students respond to teacher’s question | To arouse students' interest |
| Step I | Teacher defines thermal energy | Students listen to teacher | To keep students focus on the lesson. |
| Step II | Teacher explains and demonstrates heat flow and asks students to observe what happens | Students listen and participate in the experiment | To encourage active participation |
| Step III | Teacher defines and explains heat transfer | Students listen to teacher and asks question where necessary | To keep them focus on the lesson |
| Step IV | Teacher mentions and explains the three methods of heat transfer as well as their applications in our daily lives. | Students pay attention to teacher’s explanation | To keep them focus on the lesson. |
| Board Summary | Thermal Energy  Thermal energy is a form of Kinetic energy which can be transferred from one object to another in the form of heat. Thermal energy is also heat energy. Heat always migrate by the hotter object to the cooker object. When a cup of hot water is poured in a jug containing cold water, the thermal energy move from the hot water to the cold water until it becomes warm or evenly distributed.  Heat Flow  When two bodies are in contact, if the temperatures are not the same, heat will flow from the hotter body to the colder one. The bigger the temperature difference, the greater the flow of heat.  Note: Temperature is a measure of how hot or cold an object , body or environment is. It is measured in degree Celsius(°C) while heat is measured in Joules(J)  Heat Transfer  Heat transfer is the passage of thermal energy from a got body to a cold body. When the body and the surrounding reach the same temperature, it is called thermal equilibrium.  Methods of heat transfer  There are three ways in which heat can be transferred:  1.Conduction  2.Convection  3.Radiation  Heat transfer by conduction  Conduction is the movement of heat through solids. Metals are good conductors of heat while non- metals are generally poor conductors of heat. Poor heat conductors are called insulators. Examples of insulators are: air, feather, wood and wool  Application of Conduction  1.Conduction is used in ironing clothes.  2.It is applied in thermometers  3.It is used to unscrew the lid of a jar.  Heat Transfer by Convection  Convection is heat transfer in liquids and gases. Liquids and gases are called fluids because they flow, their particles can move around freely.  When water is heated for example, particles nearest to heat source move around more. The spaces between the particles get bigger and the hot water rises because it becomes less dense while the colder water sinks down.  Application of Convection  1.Land and sea breeze are convection phenomenon  2.Convection is applicable in boiling water.  3.It is also applicable in air conditioner.  4.Refrigerators use convection for cooling.  5.Car engine are cooled by Convection currents in the water pipes.  6.Domestic hot water supply is based on convection phenomenon.  Hear Transfer by Radiation  Radiation is the transfer of heat by electromagnetic waves mainly infrared radiation. Radiation does not need matter to pass through. That is why we feel the heat of the sun even though it is 150 million Km away.  Some surfaces absorb (take up) and reflect (throw back) radiation than others. Dark colours or dull surfaces absorb heat radiation while light colours or shiny surfaces reflect heat radiation.  Application of Radiation  1.Radiation is used for drying clothes, grains etc.  2.It is also used to warm our bodies.  3.Heat from sun, oven or kitchen is felt through radiation. | Students copy the note on the board. | To serve as reference point to students. |
| Evaluation | Teacher asks students the following questions:  1.Define thermal energy.  2.Explain heat flow.  3.Define heat transfer.  4. Mention the three methods of heat transfer. | Students respond to teacher’s questions. | To ascertain students’ understanding of the lesson. |
| .Conclusion | Teacher assesses students and make corrections where necessary. | Students take correction. | To ensure a better understanding. |
| Assignment | Explain land and sea breeze as a convection phenomenon. | Students write the assignment in their books. | To engage students at home. |