Lesson plan for week 6 ending, 17th February, 2023

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| Term | 2nd term |
| Week | Week 6 and 7 |
| Date | 13th/14th/15th February, 2023 |
| Class | JSS 2 |
| Subject | Basic Science |
| Topic | Work, Energy and Power |
| Sub-topic | Meaning and Calculations on Work done and power |
| Period | 9th/7th/9th |
| Time | 2:00-2:30pm/ 12:30-1:00pm/ 2:00-2:30 pm |
| 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.Explain work done and give the mathematical equation.  2.Solve calculations on work done  3.Define power  4.Solve calculations on power |
| Rationale | To enable students know the meaning of work done and power as well as solving the calculations on work done and power. |
| Previous knowledge | Students have learnt energy transfer when work is done. |
| Instructional resource | Students, desk, and Picture from textbook |
| Reference materials | i.Comprehensive Basic Science for JSS 2 by O.J Ehindero et al.  ii.Excellence in Basic Science and Technology for JSS 2 by Olushola Felix Bello et al.  iii.Examination success by Mary Jane I.A |

LESSON DEVELOPMENT

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| Steps | Teacher’s Activities | Students’ Activities | Learning Point |
| Introduction | Teacher revises the previous lesson | Students listen to teacher | To arouse students' interest |
| Step I | Teacher explains work done and gives the mathematical equation of work done as:  Work done=Force × distance | Students pay attention | To keep students focus on the lesson |
| Step II | Teacher guides students to solve calculations on work done | Students participate in the class activity | To encourage critical thinking |
| Step III | Teacher defines power and explains power | Students listen to teacher and ask questions where necessary | To keep students focus on the lesson |
| Step IV | Teacher guides students to solve calculations on power | Students take part in class activity | To keep students focus on the lesson |
| Board Summary | Work, Energy and Power  >Work  Work is defined as force acting upon an object to cause a displacement. Work is said to be done when an application of force moves through a distance in direction of the force.  Mathematically,  Work don(W)= F×d  Where;  F= Force applied  D=distance moved in the direction of force  Work is measured in Joules(J)  Force is measured in Newton (N) and  Distance is measured in meters(m)  Larger units used to measure work are:  Kilo Joule(KJ) and  Mega Joule(MJ)  1KJ= 1000J(or 10^3J)  1MJ=1,000,000J(or10^6J)  Calculations on work done  1.How much work is done when a box is pushed with a force of 10N over a distance of 5m?  Solution  Work done=Force ×distance  Force=10N  Distance=5m  Work done=F×d  =10×5  =50  Work done=50 Joules  2.Calculate the work done by a man of mass 90kg climbing a ladder 5m high.  Solution  Work done= Force × distance  Force=?  Distance=5m  Mass= 90kg  Force=Mass × acceleration  =90×10  =900  Force=900N  Work done= F×d  =900×5  =4500  Work done=4500 Joules  3.A book is dragged along a horizontal smooth floor by a force of 500N. If the work done is 5000J, what is the distance covered?  Solution  Work done= Force× distance  Work done= 5000J  Force=500N  Distance=?  Work done=F×d  5000=500×d  5000 = 500×d  500. 500  D=10  Distance covered=10meters  Power  Power(P) is the rate at which work is done. It can also mean the rate at which energy is converted from one form into another.  Mathematically,  Power= Work done  Time taken  The S.I unit of power is Watts(W) and it is a rate if doing 1 Joule of work per second.  That is; 1Watt(1W)= 1 Joule/second (1J/S)  Larger units off power are:  Kilowatt (KW) and Megawatts(MW)  1KW= 1000W(or 10^3W)  1MW=1,000,000 (or 10^6W)  Calculations on Power  1.If a crate of 1000N is dragged horizontally by an engine along the floor of distance 6m in 5seconds. Calculate the power of the engine.  Solution  Power= Work done  Time taken  Force= 1000N  Distance=6m  Time taken=5s  Work done= F×d  =1000×6  =6000J  Power= Work done  Time taken  =6000/5  =1200  Power= 1200Watts  2.Calculate the power of a child in watt that has done work of 30 Joules in 5 seconds.  Solution  Power = Work done  Time taken  Work done = 30 Joules  Time taken = 5 seconds  Power= Work done  Time taken  =30/5  =6  Power= 6Watts  3.How much power does a student of 30kg mass who climbed a stair with 10 steps and one step is 15cm high in 30 seconds has?  Solution  Power= Work done  Time taken  Mass=30kg  Time taken= 30seconds  Distance=15cm  15cm to metres  100cm=1m  15cm=?  15×1  100  =0.15m  0.15m×10steps  0.15×10  =1.5m  Distance=1.5m  Force= mass× acceleration  =30×10  =300N  Work done= F×d  =300×1.5  =450 Joules  Power= Work done  Time taken  Power= 450  30  =15 Watts | Students copy the note on the board | To serve as as reference point to the students |
| Evaluation | Teacher asks students the following questions:  1.Explain work done and give the mathematical equation.  2Okon is moving with a force of 20N, collides with Fatima and causes her to fall over a distance of 5m. Calculate the work done by Okon.  3.Define Power  4.Calculate the power of a child in watts that has done work of 30 Joules in 5 seconds. | 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 | 1.The amount of work done when a weight of 0.5kg is raised to a height of 5m is -----  2.Okon is moving with a force of 20N, collides with Fatima and causes her to fall over a distance of 5m. Calculate the work done by Okon.  3.Calculate the force in Newton of a car of mass 20kg accelerating at 2m/s^2  4.An engine of mass 50kg pumped water through a vertical height of 4m in 10 seconds. Calculate the power of the pump. (g=10m/s^2)  5.Calculate the power of a pump in watts required to lift 160kg of water through a vertical height 3m in 30 seconds. (g=10m/s^2) | Students write down the assignment. | To engage students while at home. |