**Daily Lesson Plan**

Subject : Physics

Class :

Date :

Day :

Time : 8.00 – 9.00 am (60 min)

Number of students :

Learning Area : Gravitation

Content Standard : Kepler’s law

Learning Standard : 3.2.1 Explain Kepler’s Laws.

Learning Outcomes: Students can:

A Master content knowledge (*at the ‘remember’ and ‘understand’ level of thinking*)

a. Explain Kepler’s Laws correctly verbally using own words and in writing.

B Master Scientific Skills/TSTS (*at the level of thinking ‘apply’ an above* *or any of the scientific skills [science process skills and manipulative skills*])

a. Determine whether elliptical orbits of planets are almost circular by making a simple investigation on simpler model of Solar system correctly.

C Demonstrate Scientific Attitudes and Noble Values

a. Appreciate the value of time by carrying out the investigation and group discussion briskly and being on task all the time.

Scientific Concepts: Kepler’s first law states that all planets move in elliptical orbits, with the sun at one focus. (Law of Orbits)  
Kepler’s second law states that a line that connects a planet to the Sun sweeps out equal areas in equal times. (Law of Areas)  
Kepler’s third law states that the square of the period of any planet is directly proportional to the cube of the radius of its orbit. (Law of Period)

Main Teaching and Learning Method: Cooperative learning (Jigsaw technique)

Assessment: Q&A, Concept map, Informal observation during group discussion

Materials, equipments and resource materials:

* Powerpoint slides
* Marker pen
* Laptop
* Mahjung paper

Safety Precautions: None

Prior Knowledge:

Students have learnt the definition of velocity and mass, have applied them in solving problems and also understand the concept of inertia.

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| **Phase** | **Content** | **Teacher’s activities** | **Students’ activities** | **Notes** |
| Introduction & Elicitation of ideas  (5 minutes) | Planets orbit in elliptical shape with Sun being at the one of the foci of the ellipse. | Show video related to the orbits of planets in Solar system to attract attention and give a general vision of the lesson.  Ask questions about orbits and whether there’s any law that governs the motion of planets to elicit students’ ideas | Watch the video, and answer questions | Assessment:  Q & A |
| Structuring/ restructuring of ideas  (30 minutes) | Kepler’s first law states that all planets move in elliptical orbits, with the sun at one focus. (Law of Orbits)  Kepler’s second law states that a line that connects a planet to the Sun sweeps out equal areas in equal times. (Law of Areas)  Kepler’s third law states that the square of the period of any planet is directly proportional to the cube of the radius of its orbit. (Law of Period) | Group students into 6 students in each group.  Number the students in each group from 1 to 3 so that each group will have two students for each number.  Assign one topic (Kepler’s first law, Kepler’s second law, and Kepler’s third law.  Kepler’s first law, Kepler’s second law, and Kepler’s third law) to each number group.  Ask students to gather information from their textbook or reference books and discuss in groups with same number.  Facilitate small group discussion and investigation. | Gather information from textbook or reference book.  Discuss with friends with the same number.  After discussing, return to their own groups to share the information and ideas with group members.  . | T&L method:  Cooperative learning (JIGSAW)  Find and gather information in small groups.  Assessment:  Q&A and observation during group discussion  Noble value: Appreciate time |
| Application of ideas  (15 minutes) | Ask students to form a concept map to relate Kepler’s first law, Kepler’s second law, and Kepler’s third law.  Facilitate small group discussion and investigation.  Show an acceptable concept map to students. | Discuss the relationship between Kepler’s first law, Kepler’s second law, and Kepler’s third law.  Draw their concept map on a piece of *mahjung* paper.  One representative of the groups stays to explain the concept map of the particular group while others get explanation from others groups’ work.  Write some comments to others’ works.  Finalize own concept map after teacher gives information and ideas. | T&L method:  Group discussion,  Gallery walk method.  Assessment:  Q & A, observation during group discussion  Concept mapping  Noble value: Appreciate time. |
| Reflection& Closure  (10 minutes) | Assess students using Quizziz platform  Let students reflect on their learning  Give further homework.  Motivate students to learn. | Answer the questions.  Reflect on their learning using PMI template | Assessment:  Quiz on Quizziz  Reflection using PMI |