

Summary

Topic 6 - Circular motion

Subject	Year	Start date	Duration
Physics	IB1, IB2	Week 4, February	2 weeks 5 hours

Course Part
SL/HL

Curriculum

Aims

- Appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
- Acquire a body of knowledge, methods and techniques that characterize science and technology
- Apply and use a body of knowledge, methods and techniques that characterize science and technology
- Develop an ability to analyse, evaluate and synthesize scientific information
- Develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
- Develop experimental and investigative scientific skills including the use of current technologies
- Develop and apply 21st century communication skills in the study of science
- Become critically aware, as global citizens, of the ethical implications of using science and technology
- Develop an appreciation of the possibilities and limitations of science and technology
- Develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge

Objectives

Demonstrate knowledge and understanding of

- facts, concepts and terminology
- methodologies and techniques
- communicating scientific information

Apply

- facts, concepts and terminology
- methodologies and techniques
- methods of communicating scientific information

Syllabus Content

Core

6. Circular motion and gravitation

6.1 – Circular motion

Nature of science:

Observable universe: Observations and subsequent deductions led to the realization that the force must act radially inwards in all cases of circular motion.

Understandings:

Period, frequency, angular displacement and angular velocity

Centripetal force

Centripetal acceleration

Applications and skills:

Identifying the forces providing the centripetal forces such as tension, friction, gravitational, electrical, or magnetic

Solving problems involving centripetal force, centripetal acceleration, period, frequency, angular displacement, linear speed and angular velocity

Qualitatively and quantitatively describing examples of circular motion including cases of vertical and horizontal circular motion

6.2 – Newton's law of gravitation

Nature of science:

Laws: Newton's law of gravitation and the laws of mechanics are the foundation for deterministic classical physics. These can be used to make predictions but do not explain why the observed phenomena exist.

Understandings:

Newton's law of gravitation

Gravitational field strength

Applications and skills:

Describing the relationship between gravitational force and centripetal force

Applying Newton's law of gravitation to the motion of an object in circular orbit around a point mass

Solving problems involving gravitational force, gravitational field strength, orbital speed and orbital period

Determining the resultant gravitational field strength due to two bodies

ATL Skills

Approaches to Learning



Thinking

- In this unit, we will

ask students to formulate a reasoned argument to support their opinion or conclusion

give students time to think through their answers before asking them for a response

reward a new personal understanding, solution or approach to an issue

ask open questions

set students a task which required higher-order thinking skills (such as analysis or evaluation)

build on a specific prior task

help students to make their thinking more visible (for example, by using a strategy such as a thinking routine)

require students to take an unfamiliar viewpoint into account when formulating arguments

ask questions that required the use of knowledge from a different subject from the one you are teaching

include a reflection activity

make a link to TOK



Social

- In this unit, we will

have students work in small groups

allocate, or ask students to allocate among themselves, different roles in a classroom discussion or activity

have students peer assess their group performance or process

support students in resolving a conflict in a team

give a group assessment task

give students feedback on how they worked as a group

have students discuss their understanding of a text or idea among themselves and come up with a shared understanding

provide an opportunity for students to analyse the impact of their behaviour on the class or on a group performance

encourage students to consider alternative points of view or to take the perspective of others

provide opportunities for students to make decisions

IB DP 12 PHY 6 HL (IB1)



Developing IB Learners

☆ Learner Profile



Inquirers



Knowledgeable



Thinkers



Communicators



Reflective