2023

NEW

HARROAN S.1 PHYSICS

Learner's book

Second edition

With 100 Lesson periods

2023

Guide notes
Group activities
Project guideline
Practical
Questions
And more

Revised from 2022 version and reviews from those who used it

HARROAN'S

New curriculum work book for

2023

s.1

Physics

This book has been made & revised basing on new curriculum for lower secondary education syllabus

Student's information.

This book belongs to:

Name .....

School .....

Class .....

Stream .....

CHAPTER 01 INTRODUCTION TO PHYSICS

By the end of the chapter you should;

- Be able to define physics and its branches
- Be able to relate physics with everyday life activities
- Be able to understand the importance of a physics laboratory
- Be able to identify the rules of a physics laboratory.

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NCDC TOPIC PROPOSED TIME FOR THE CHAPTER

Lesson Periods – 6

Weekly periods – 3

Coverage time – 2 weeks

Lesson period 1

1.1 The meaning of physics

Introduction to lesson; In this period, you are required to describe the examples of physics in daily life.

Lesson learning objectives;

- To define physics
- To describe fields where physics is applied in daily life.

Guide notes

What is physics?

Physics is the branch of science which deals with the study of matter and its relationship with energy.

Matter is anything that occupies space and has weight. Energy is the ability to do work.

Physics is a science that asks basic questions about life and finds answers through observations and experimentation. Without physics, planes cannot fly as well as cars cannot move and buildings cannot be built.

Examples of physics in daily life.

The applications of physics in everyday life are numerous. We use physics in activities such as walking, playing, watching, listening, cutting, cooking, opening and closing things.

1. Alarm clock

The buzzing sound of an alarm clock helps you to wake up in the morning. Physics studies the properties of sound. The alarm clock works on the concept of quantum mechanics.

2. Steam iron

The steam iron is used for ironing clothes. The concept of physics used in the steam iron is Heat.

3. Walking

While walking, you have a good grip without slipping because of resistance between the soles of your shoes and the surface of the road. This resistance is called friction which is a concept of physics

4. Ball point pen

As your pen moves across the paper, the ball turns and gravity forces the ink down onto the top of the ball where it's transferred on the paper.

5. Headphones.

When you plug your headphones or ear phones into an electric source, the magnet in your headphone creates an electromagnetic field, which results into sound waves.

6. Cell phones

A cell phone works on the principle of electricity and electromagnetic spectrum. Therefore the physics involved in cell phones is electricity and magnetism.

Group activity 1

In groups of 3 to 5 students, carry out research and answer the activity. Present to the class. The pictures below show different fields where physics is applied. For each, Name the field and state their uses in daily life. Present to the rest of the class

Field 1

Field 2

Field 3

Field 4

Field 5

Field 6

Energy, technology & computer, transportation & movement, Medicine, Communication & satellites and Aviation & space

Lesson period 2 1.2 Natural occurrences related to Physics

Introduction to lesson; In this period, you are to describe the Natural occurrences related to physics and investigate the history of physics.

Lesson learning objectives;

- To describe the natural occurrences related to physics
- To describe how different people contributed to the history of Physics

Guide notes

Natural occurrences related to Physics

Complex natural phenomena can be anything from our bodily processes to interactions between the elements of Nature. There is always a reason behind what we experience and a possible link to the science we study.

Some we may be familiar with; others may provide exciting applications to the different theories we have learnt.

Examples of some various phenomena happening around us and the physics behind them.

1. Lightning and thunder

Lightning and thunder is one of the most common phenomena we see and experience. As the temperature of the clouds drop below the freezing point, water vapour is converted into its solid state, forming ice. The ice molecules gain kinetic energy and start to vibrate inside the cloud, making them collide and rub against each other, producing charges that we would eventually see as lightning
As for thunder, it comes after lightning. When lightning strikes the earth, a column of air is opened, called a channel. Once the light is gone, the air channel collapses back in on itself, creating a sound wave that we would recognize as thunder.

2. Rainbow formation

Rainbows are multicolored arches that we occasionally see on rainy days. When a downpour (rain) nears its end, and the sun reveals its self from the departing clouds, the sunlight shines on the water droplets floating in the air. As the light passes through the water droplets, it bends and splits the light, which is comprised of several wavelengths, into the seven distinct colours we see in a rainbow.

3. Sweating and thermodynamics

To understand why we sweat, we need to first understand that energy is neither created nor destroyed, but it can only be transferred from one form to another. When our body heat rises, above a certain level, our skin will start to produce sweat. The heat causes your sweat to evaporate, which transfer the heat into the atmosphere, allowing our body temperatures to drop to acceptable levels.

Lightning

Rainbow

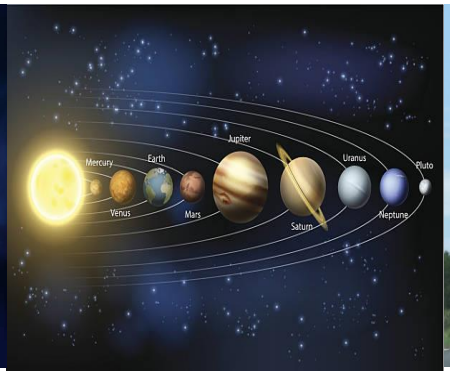
Sweating

Group activity 2a

The pictures below show some examples of natural occurrences related to physics. For each, identify the occurrence, briefly describe how it occurs. You will need to research from textbooks and the internet. Present your findings to the class

Rainfall formation, storm, rotation of planets around the sun, solar eclipse, mirage, and earthquakes.

A



B

C

D

E

F

Lesson period 3 1.3 Branches of physics

Introduction to lesson;

For this period, you are to define the different branches of physics, give their importance, discuss about the occupations related with them using the provided guide notes though you will carry out more research using textbooks and internet.

Lesson learning objectives;

- To define different branches of physics
- To outline the importance of each branch to the community
- To identify occupations related with each branch

Guide notes

BRANCHES OF PHYSICS

Physics can be classified into various branches, but classical physics is mainly concerned with energy and matter. The traditional branches of classical physics are optics, acoustics, electromagnetics and classical mechanics. With the rapid development of physics, the scope of the subject is growing so large that it is not possible to cover the entire physics under the above branches.

Group activity 3a;

In groups, research using textbooks and internet and complete the table below about some of the branches of physics.

Branch of Physics	Definition	importance
Mechanics	Is a branch of Physics that deals with motion of objects under action of forces.	• Its concepts of inertia are used in seat belts of cars.
Light (optics)		
Heat (thermodynamics)		
Electricity		
Magnetism		

Waves		
Modern physics		

1. A mechanic

Is a skilled worker who repairs and maintains vehicles especially cars. Many mechanics are specialized in a particular field such as auto mechanics, bicycle mechanics, motorcycle mechanics. etc

2. A technician

Is a person employed to look after a technical equipment. A technician repairs, installs, replaces and services different systems and equipments. Examples of technicians include electronic technicians; who diagnose and repair different types of electronic equipments e.g computers, microwaves. Phone technicians; who repairs broken landlines and cell phones.

Group activity 2b;

In your groups, you are required to research and complete the table below about economic activities in various branches of Physics

Branch	Occupation	Description
Mechanics	**Auto mechanic**	Is a person who services and repairs automobiles i.e. cars
	Phone technician	
	Optical physicists	

Optics (light)	Laser engineer	
	Optical scientist	
Heat (thermodynamics)	Mechanical engineer	
	Thermodynamics engineer	
	Energy engineer	
Electricity	Electrical engineer	
	Electrician	
	Power plant operator	
	Cardiovascular technician	
Magnetism	Magnetic engineers	
	Robotics engineer	
	Geomagnetist	

Waves and sound	Ultra sound technician	
	Speech therapist	
	Audiologist	
Modern physics	Astronomer	
	Machine learning engineer	

The pictures below show some of the economic activities related with various branches of physics. Use them to answer the questions that follow

A

B

C

D

a) Identify the professions shown

A .....

B .....

C .....

D ....

b) State the branch of biology for each of the profession.

A .....

B .....

C .....

D .....

c) Outline the importance of each of the profession to our community.

A

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B

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C

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D

HARROAN S1 PHYSICS SOON OUT

BOOK OVERVIEW

Harroan s1 Physics learner's book is a work book made and revised to simplify learner's understanding of Pysics based on the new curriculum.

The book is a development of the 2022 version and has been improved basing on the reviews of those who used the 2022 version

Number of pages – 200

Number of lesson periods – 100

Support structure; Harroan will provide a support to teachers on the expected answers in this work book. For more information read the full book overview pdf document

Selling structure

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