

Acc Physics Unit 12 - Magnetism

Content Area: **Science**
Course(s): **CP Physics, Accelerated Physics**
Time Period: **Marking Period 4**
Length: **3 Weeks**
Status: **Published**

Unit Overview

In this unit students will examine concept of magnetism and how magnetic fields can be used to predict the interaction of charged particles within the field.

Enduring Understandings

- The internal structure of a system determines many properties of the system.
- Materials have many macroscopic properties that result from the arrangement and interactions of the atoms and molecules that make up the material.
- A field associates a value of some physical quantity with every point in space. Field models are useful for describing interactions that occur at a distance (long- range forces) as well as a variety of other physical phenomena.
- At the macroscopic level, forces can be categorized as either long-range (action-at-a- distance) forces or contact forces.
- Certain quantities are conserved, in the sense that the changes of those quantities in a given system are always equal to the transfer of that quantity to or from the system by all possible interactions with other systems.
- Physicists often construct a map of isolines connecting points of equal value for some quantity related to a field and use these maps to help visualize the field.
- The electric and magnetic properties of a system can change in response to the presence of, or changes in, other objects or systems.
- A magnetic field is caused by a magnet or a moving electrically charged object. Magnetic fields observed in nature always seem to be produced either by moving charged objects or by magnetic dipoles or combinations of dipoles and never by single poles.

Essential Questions

- What is a magnetic field? How is it created?
- What is magnetism?
- How is magnetism related to electricity?
- How do phenomena on the microscopic level affect macroscopic motion?

New Jersey Student Learning Standards (No CCS)

SCI.HS-PS2-5

Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.

Amistad Integration

N/A

Holocaust/Genocide Education

N/A

Interdisciplinary Connections

MA.A-SSE.A.1a

Interpret parts of an expression, such as terms, factors, and coefficients.

MA.A-CED.A.1

Create equations and inequalities in one variable and use them to solve problems.

MA.A-CED.A.4

Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

MA.A-REI.B.3

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

MA.F-LE.B.5

Interpret the parameters in a linear or exponential function in terms of a context.

MA.F-TF.B.7

Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.

Technology Standards

TECH.8.1.12.A.4

Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.

TECH.8.1.12.A.5

Create a report from a relational database consisting of at least two tables and describe the process, and explain the report results.

TECH.8.1.12.A.CS1

Understand and use technology systems.

TECH.8.1.12.A.CS2

Select and use applications effectively and productively.

TECH.8.1.12.B.CS1

Apply existing knowledge to generate new ideas, products, or processes.

TECH.8.1.12.B.CS2

Create original works as a means of personal or group expression.

TECH.8.1.12.C.CS1

Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.

TECH.8.1.12.C.CS2	Communicate information and ideas to multiple audiences using a variety of media and formats.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.D.CS1	Advocate and practice safe, legal, and responsible use of information and technology.
TECH.8.1.12.D.CS2	Demonstrate personal responsibility for lifelong learning.
TECH.8.1.12.E.CS1	Plan strategies to guide inquiry.
TECH.8.1.12.E.CS3	Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS1	Identify and define authentic problems and significant questions for investigation.
TECH.8.1.12.F.CS2	Plan and manage activities to develop a solution or complete a project.

21st Century Themes/Careers

List specific standards that are relevant
No general statements

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Financial Literacy Integration

N/A

Instructional Strategies & Learning Activities

- Six Flags Trip
- Six Flags Packet
- Right Hand Rule
- Magnetism and Electric Fields
- Packet

Formative Assessments

- Homework (Canvas and/or Written Work)
- Warm-Ups
- Exit Tickets

Summative Assessment

- Magnetism Quiz

Benchmark Assessments

- Final Exam

Alternate Assessments

- Modified homework
- Modified quizzes
- Modified tests
- Modified projects

Resources & Technology

- Google docs, spreadsheets, slides
- TI graphing calculator
- document camera
- chromebooks
- Promethean board
- websites: desmos, geogebra, EdPuzzle
- Canvas

BOE Approved Texts

Etkina et al., College Physics: Explore and Apply AP Edition, 2nd Edition ©2019 with Mastering Physics with Pearson eText