



## **Lesson Plan: Electricity and Magnetism (~100 minutes)**

### **Concepts**

1. Electricity and magnetism are fundamentally related.
2. Just as electric charge produced an electric field, electric current produces a **magnetic field**.
3. Since whenever there is current there is charge, both electric and magnetic fields exist. They are lumped together and called an **electromagnetic field**.
4. A rotating magnetic field produces an electric current.
5. A rotating electric current produces a magnetic field.
6. The right hand rule is used to determine the direction of the produced current or field.
7. The **electromagnet** is a device that is used very often in everyday objects that exemplifies the relationship between electricity and magnetism.
8. The electromagnet is used in converting electromagnetic energy to mechanical energy and back.

### **Key Questions**

1. How are electricity and magnetism related?
2. What effect does passing current through a coil of wire have?
3. How are electromagnets used in everyday objects?
4. How are electromagnets important for electric power generation?

<b>Student Learning Objectives</b>	<b>Standards</b>
Students will be able to explain how electric current can generate a magnetic field.	WYO 8.A.S.1.7, 11.A.S.1.7; Benchmarks 13 and 14
Students will be able to create an electromagnet.	
Students will be able to apply the concept of the electromagnet in the creation of a telegraph.	
Students will be able to explain how electricity and magnetism work together in electric motors and generators.	

### **Anticipatory Set**

- Students have learned about electricity, electric circuits, voltage, and current.
- They are familiar with how to connect circuit elements.
- Electricity and magnetism are closely related.

# 4th Grade Electricity And Magnetism Lesson Plans

**L Darling-Hammond**



#### **4th Grade Electricity And Magnetism Lesson Plans:**

Resources for Teaching Elementary School Science National Science Resources Center of the National Academy of Sciences and the Smithsonian Institution, 1996-04-28 What activities might a teacher use to help children explore the life cycle of butterflies What does a science teacher need to conduct a leaf safari for students Where can children safely enjoy hands on experience with life in an estuary Selecting resources to teach elementary school science can be confusing and difficult but few decisions have greater impact on the effectiveness of science teaching Educators will find a wealth of information and expert guidance to meet this need in Resources for Teaching Elementary School Science A completely revised edition of the best selling resource guide Science for Children Resources for Teachers this new book is an annotated guide to hands on inquiry centered curriculum materials and sources of help in teaching science from kindergarten through sixth grade Companion volumes for middle and high school are planned The guide annotates about 350 curriculum packages describing the activities involved and what students learn Each annotation lists recommended grade levels accompanying materials and kits or suggested equipment and ordering information These 400 entries were reviewed by both educators and scientists to ensure that they are accurate and current and offer students the opportunity to Ask questions and find their own answers Experiment productively Develop patience persistence and confidence in their own ability to solve real problems The entries in the curriculum section are grouped by scientific area Life Science Earth Science Physical Science and Multidisciplinary and Applied Science and by type core materials supplementary materials and science activity books Additionally a section of references for teachers provides annotated listings of books about science and teaching directories and guides to science trade books and magazines that will help teachers enhance their students science education Resources for Teaching Elementary School Science also lists by region and state about 600 science centers museums and zoos where teachers can take students for interactive science experiences Annotations highlight almost 300 facilities that make significant efforts to help teachers Another section describes more than 100 organizations from which teachers can obtain more resources And a section on publishers and suppliers give names and addresses of sources for materials The guide will be invaluable to teachers principals administrators teacher trainers science curriculum specialists and advocates of hands on science teaching and it will be of interest to parent teacher organizations and parents Resources in Education ,2001-04

The Essentials of Science, Grades K-6 Rick Allen, 2006-12-15 How can elementary school teachers the proverbial jacks of all trades feel more confident in their knowledge of science and teach science more effectively The Essentials of Science K 6 aims to unleash every elementary educator s inner science teacher Through a plethora of classroom examples interviews with award winning elementary science teachers and science education experts and a wide ranging look at recent research examining the state of science education readers will learn How to align curriculum to state standards using such practices as backward design How to use inquiry based science to infuse meaning into class investigations and teach students problem

solving skills Strategies for engaging students and keeping the curriculum fresh Ways to increase English language learners participation in and understanding of science How to use formative assessment techniques to determine what students know both before and during lessons How professional development can orient teachers to new content and to a deeper way of seeing the natural world With the right practices science teachers can make their students journey into learning about the natural world both productive and enjoyable The Essentials of Science K 6 provides practical information to help teachers reflect on their own approaches to teaching science and make the transition from apprehension to self assurance

**Priorities in Practice** Rick Allen, 2006 Provides program ideas and practices that will prepare school science programs for stricter new learning objectives and performance goals **Electricity & Magnetism Science Learning Guide** NewPath Learning, 2014-03-01 The Electricity How Objects become Charged Electric Current Electrical Resistance Electric Power Electric Circuits Batteries Electrical Safety and Magnetism Aligned to Next Generation Science Standards NGSS and other state standards **The National Union Catalog**, 1962 Constitutes the quinquennial cumulation of the National union catalog Motion pictures and filmstrips **Research in Education**, 1971 **Resources for Teaching Middle School Science** Smithsonian Institution, National Academy of Engineering, National Science Resources Center of the National Academy of Sciences, Institute of Medicine, 1998-04-30 With age appropriate inquiry centered curriculum materials and sound teaching practices middle school science can capture the interest and energy of adolescent students and expand their understanding of the world around them Resources for Teaching Middle School Science developed by the National Science Resources Center NSRC is a valuable tool for identifying and selecting effective science curriculum materials that will engage students in grades 6 through 8 The volume describes more than 400 curriculum titles that are aligned with the National Science Education Standards This completely new guide follows on the success of Resources for Teaching Elementary School Science the first in the NSRC series of annotated guides to hands on inquiry centered curriculum materials and other resources for science teachers The curriculum materials in the new guide are grouped in five chapters by scientific area Physical Science Life Science Environmental Science Earth and Space Science and Multidisciplinary and Applied Science They are also grouped by type core materials supplementary units and science activity books Each annotation of curriculum material includes a recommended grade level a description of the activities involved and of what students can be expected to learn a list of accompanying materials a reading level and ordering information The curriculum materials included in this book were selected by panels of teachers and scientists using evaluation criteria developed for the guide The criteria reflect and incorporate goals and principles of the National Science Education Standards The annotations designate the specific content standards on which these curriculum pieces focus In addition to the curriculum chapters the guide contains six chapters of diverse resources that are directly relevant to middle school science Among these is a chapter on educational software and multimedia programs chapters on books about science and teaching directories and guides to

science trade books and periodicals for teachers and students Another section features institutional resources One chapter lists about 600 science centers museums and zoos where teachers can take middle school students for interactive science experiences Another chapter describes nearly 140 professional associations and U S government agencies that offer resources and assistance Authoritative extensive and thoroughly indexed and the only guide of its kind Resources for Teaching Middle School Science will be the most used book on the shelf for science teachers school administrators teacher trainers science curriculum specialists advocates of hands on science teaching and concerned parents

*The Obama Education Plan* Education Week,2011-01-11 A guide to the educational priorities and change to expect from the Obama administration Although the Obama s goals for education have been articulated in his speeches and on his website what s missing is a picture of what these proposals mean in practice This guide provides the articles stories and commentary to clarify Obama s priorities for education The plan itself is comprehensive and covers preschool K 12 and college level education Among its recommendations expand early education improve teacher quality support school innovation make math and science national priorities address the dropout crisis and improve college access and affordability Compiled by Education Week education s newspaper of record Offers information and opinion on Obama s key educational priorities Provides a listing of the President s recommendations for education from pre school to college level Includes advice for the President from key education leaders

**Bulletin** ,1924      **Standards-Based Science Investigations, Grade 4** Robert W. Smith,2008-08-26 Through content area reading hands on experiences and inquiry investigations young scientists learn the essential concepts of science The language is clear simple and scientifically correct The imaginative and effective lessons cover life earth and physical sciences Helpful extras include science inquiry worksheets an inquiry assessment rubric and alignment to standards

**Bulletin** United States. Office of Education,1924      Teaching Science Through Discovery Arthur A. Carin,Robert B. Sund,1964      **Physical Science Grade 5** Bellaire, Tracy,2014-06-12 The experiments in this book fall under seventeen topics that relate to four aspects of physical science Properties of and Changes in Matter Chemistry in the Classroom Forces and Simple Machines Forces Acting on Structures and Mechanisms Mechanisms Using Electricity and Electricity and Magnetism In each section you will find teacher notes designed to provide you guidance with the learning intention the success criteria materials needed a lesson outline as well as provide some insight on what results to expect when the experiments are conducted Suggestions for differentiation are also included so that all students can be successful in the learning environment 96 pages

East European Accessions List Library of Congress. Processing Department,1951

Harcourt Science: Physical science, [grade] 4, Units E and F, teacher's ed. [v. 18]. Life science, [grade] 5, Units A and B, teacher's ed ,2000      **Bulletin - Bureau of Education** United States. Bureau of Education,1906      **Journal of Education and School World** ,1888      *Statistics of Land-grant Colleges and Universities* United States. Office of Education,1924

**Manual Arts in the Junior High School** William Elmer Roberts,1924

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