

Electricity

ALTERNATING CURRENT

9 min; color; h,c,a

1/2" VHS **FC1664,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: definition of direct current, alternating current and effect on ammeter, high voltage transmission, transformers, sine wave, cycle-periods and frequency, Hertz, amplitude, phase, and root mean square. (IFB;c1982)
Electricity

BASIC ELECTRICITY SERIES

Uses graphic illustrations and live-action sequences to identify and explain the fundamental concepts for understanding the principles involved in the production and utilization of electricity. *For descriptions see individual titles:*

ALTERNATING CURRENT [FC1664]
CAPACITANCE [FC1668]
CURRENT FLOW [FC1661]
EARTH GROUNDS AND SHORT CIRCUITS [FC1671]
ELECTRIC POWER [FC1666]
FUSES [FC1672]
HOW ELECTRICITY IS PRODUCED [FC1659]
INDUCTANCE [FC1665]
MISCELLANEOUS ELECTRICAL EQUIPMENT [FC1670]
MOTORS AND GENERATORS [FC1669]
OHM'S LAW [FC1662]
RESISTOR COLOR CODE [FC1667]
SERIES AND PARALLEL RESISTORS [FC1663]
WHAT IS ELECTRICITY [FC1658]

CAPACITANCE

8 min; color; h,c,a

1/2" VHS **FC1668,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: capacitance; capacitors and their construction; a demonstration of charging and discharging capacitors; plate area, separation distances, and dielectric; the types and uses of capacitors; and the unit of capacitance, the farad. (IFB;c1982)
Electricity

COULOMB'S LAW

30 min; b&w; h,c

1/2" VHS **FB0570,VH**

Pssc Physics Series - Demonstrates the inverse square variation of electric force with distance, and also the fact that electric force is directly proportional to charge. Introduces the demonstration with a discussion of the concept of the inverse square. The law is tested using a large scale Millikan apparatus and by looking for electrical effects inside a hollow charged sphere. Demonstration by Eric Rogers, Princeton University. (EDSI;WARDS;c1959)
Electricity; Force and energy

CURRENT FLOW

9 min; color; h,c,a

1/2" VHS **FC1661,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: electron current and conventional current, magnetic field around a wire, the "left-hand grip" rule, "dart notation," magnetic field in a coil, the solenoid, the electromagnet, electromagnetic force, volts, and resistance. (IFB;c1982)
Electricity

EARTH GROUNDS AND SHORT CIRCUITS

8 min; color; h,c,a

1/2" VHS **FC1671,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: ground, zero volts, faulty insulation, the ground connection, open circuit, two ground connections, short circuit, and series and parallel ground return circuits. (IFB;c1982)
Electricity

ELECTRIC CURRENTS AND CIRCUITS

14 min; color; i,j,h

1/2" VHS **FC1538,VH**

Physical Sciences Series - Explains, using live-action and animated sequences, how energy is continually transferred by electrical currents through intricate networks of circuits. Discusses the concepts of voltage, current, resistance, series and parallel connections, and power. Looks at how and why current is controlled in different circuits, and points out the links between the increasing demands for power and brownouts and blackouts. (CORT;c1985)
Electric power; Electricity

ELECTRIC POWER

11 min; color; h,c,a

1/2" VHS **FC1666,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: definitions of work and power; the electrical components; the power formula $P = VI$; watts; P in terms of V , I , and R ; overload; and insulation. (IFB;c1982)
Electricity

THE ELECTRIC VALLEY

90 min; color; c,a

1/2" VHS **CC4515,VH**

Traces the fifty-year embattled history of the Tennessee Valley Authority, one of America's boldest and most far-reaching political experiments. Tells the story of a federal agency with the broadest possible mission: to tame the forces of nature, and to create energy to produce a lasting prosperity in the Depression-wracked Tennessee Valley, a region the size of Great Britain. Treats the Tennessee Valley Authority as a microcosm of the energy/economic/political problems that the nation has faced in the last half-century. Puts a human face on the Tennessee Valley Authority by focusing on the human drama, the stories of success and tragedy in this unique agency. (SPEARO;AGEEJAF;c1983)
Electric power; U.S.—Politics and government; U.S.—Regions

ELECTRICITY: FORCE THAT CHANGED THE WORLD

50 min; color; j,h,c

1/2" VHS **FC1829,VH**

Documents the development of electricity from the Greek word for amber, "electrum" to the most famous discoveries of the 19th century. Examines a variety of helpful electric inventions, such as the telegraph, lighting, the phonograph and the radio. Reviews the dramatic effect electricity has had on civilization from a historical perspective. Anticipates some future developments. (LAEM;c2001)
Electricity; Science—History

FUSES

6 min; color; h,c,a

1/2" VHS **FC1672,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: fuse wire red hot and rupturing, fuses and a fused switch, "blown" fuse, position of fuse in a circuit, construction of cartridge and H.R.C. fuses, and fuse rating. (IFB;c1982)
Electricity

Electricity

HOW ELECTRICITY IS PRODUCED

9 min; color; h,c,a

1/2" VHS **FC1659,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: batteries, current measurement, cell and chemical action, copper as positive terminal and zinc as negative, external circuit, and construction and uses of primary and secondary cells. (IFB;c1982)

Electricity

INDUCTANCE

10 min; color; h,c,a

1/2" VHS **FC1665,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: effect of a magnet on a coil, e.m.f. of self-induction, Lenz's Law, inductor-choke, non-inductive winding, the "henry," inductors in a yoke, e.m.f. of mutual induction, the transformer, examples of "turns of voltage" ratios, and types of transformers. (IFB;c1982)

Electricity

MECHANICAL UNIVERSE SERIES

Makes use of intricate sets and demonstration experiments, on-location shooting of such places as Newton's home and Galileo's haunts, and sophisticated computer-animation sequences. Based on the physics course developed by Dr. David Goodstein and introduced at the California Institute of Technology.

MECHANICAL UNIVERSE, NO. 11: GRAVITY, ELECTRICITY, MAGNETISM

30 min; color; c

1/2" VHS **FC1487,VH**

Explains the gravitational force between two masses, the electric force between two charges, and the magnetic force between two poles. Shows how all three phenomena take essentially the same mathematical form. (ANBERG;FI;p1985)

Electricity; Gravitation; Magnetism

MECHANICAL UNIVERSE AND BEYOND SERIES

Continues the Mechanical Universe series. Employs an array of visual techniques including: precision closeup photography of experiments, computer animation sequences, and historical reenactments. Based on the Caltech course by Professor David Goodstein.

MECHANICAL UNIVERSE AND BEYOND, NO. 2: STATIC ELECTRICITY

30 min; color; c,a

1/2" VHS **FC1555,VH**

Focuses on Charles Coulomb's law and the principles of static electricity which were developed during the 18th century. *Closed Captioned.* (CAIT;FI;c1986)

Electricity

MECHANICAL UNIVERSE AND BEYOND, NO. 3: ELECTRIC FIELD

30 min; color; c,a

1/2" VHS **FC1556,VH**

Michael Faraday's vision of lines of constant force in space laid the foundation for the modern idea of the field of force. Discusses electric fields of static charges, Gauss's law, and the conservation of flux. *Closed Captioned.* (CAIT;FI;c1986)

Electricity; Force and energy

MECHANICAL UNIVERSE AND BEYOND, NO. 4: CAPACITANCE AND POTENTIAL

30 min; color; c,a

1/2" VHS **FC1557,VH**

Discusses electrical potential, the potential of charged conductors, equipotentials, and capacitance. Explains that Benjamin Franklin was the first to propose a successful theory of the Leyden Jar, invented the parallel plate capacitor, and gave positive and negative charges their name. *Closed Captioned.* (CAIT;FI;c1986)

Electricity

MECHANICAL UNIVERSE AND BEYOND, NO. 5: VOLTAGE, ENERGY AND FORCE

30 min; color; c,a

1/2" VHS **FC1558,VH**

Discusses the electrical potential and its gradient, the potentials of atoms and metals, electrical energy, and why sparks jump. *Closed Captioned.* (CAIT;FI;c1986)

Electricity

MECHANICAL UNIVERSE AND BEYOND, NO. 6: ELECTRIC BATTERY

30 min; color; c,a

1/2" VHS **FC1559,VH**

Discusses the internal and external potentials of metals and the internal workings of an electric battery. Explains that electricity changed from a curiosity to a central concern of science and technology in 1800 when Alessandro Volta invented the electric battery.

Closed Captioned. (CAIT;FI;c1986)

Electricity

MECHANICAL UNIVERSE AND BEYOND, NO. 7: ELECTRIC CIRCUITS

30 min; color; c,a

1/2" VHS **FC1560,VH**

Discusses electrical concepts of circuits. Explains that the design and analysis of currents flowing in series and parallel circuits of resistors and capacitors depend not only on the laws of Ohm and Kirchhoff, but on the less celebrated work of Charles Wheatstone as well. *Closed Captioned.* (CAIT;FI;c1986)

Electricity

MECHANICAL UNIVERSE AND BEYOND, NO. 9: MAGNETIC FIELD

30 min; color; c,a

1/2" VHS **FC1562,VH**

Discusses the Biot-Sarvart law, the force between electric currents, and Ampere's law. Explains that all magnetic fields can be thought to be produced by electric currents. *Closed Captioned.* (CAIT;FI;c1986)

Electricity; Magnetism

MECHANICAL UNIVERSE AND BEYOND, NO. 10: VECTOR FIELDS AND HYDRODYNAMICS

30 min; color; c,a

1/2" VHS **FC1563,VH**

Examines the concept of fields, pointing out that they have definite properties suitable for scientific study. Explains that electric fields are different in form from magnetic fields and that both can be better understood by analogy to fields of fluid flow. *Closed Captioned.* (CAIT;FI;c1986)

Electricity; Magnetism

MECHANICAL UNIVERSE AND BEYOND, NO. 11: ELECTROMAGNETIC INDUCTION

30 min; color; c,a

1/2" VHS **FC1564,VH**

Discusses the 1831 discovery of electromagnetic induction by Michael Faraday and Joseph Henry which made it possible to generate electric power. *Closed Captioned.* (CAIT;FI;c1986)

Electricity

Electricity

THE DAY THE UNIVERSE CHANGED, NO. 12: ALTERNATING CURRENT

30 min; color; c,a

1/2" VHS **FC1565,VH**

Discusses how alternating current circuits obey a differential equation identical to the harmonic oscillator resonance equation. *Closed Captioned.* (CAIT;FI; c1986)

Electricity

MECHANICAL UNIVERSE AND BEYOND, NO. 13: MAXWELL'S EQUATIONS

30 min; color; c,a

1/2" VHS **FC1566,VH**

Shows how James Clerk Maxwell developed his famous set of equations that unified the theories of electricity and magnetism in the nineteenth century. Explains the role of experiments by Michael Faraday in Maxwell's thinking and includes references to the work of Henry, Ampere, and Oersted. *Closed Captioned.* (CAIT;FI;c1986)

Electricity; Magnetism

MECHANICAL UNIVERSE AND BEYOND, NO. 14: OPTICS

30 min; color; c,a

1/2" VHS **FC1567,VH**

Discusses Maxwell's theory, which says that electromagnetic waves of all wavelengths, from radio waves to gamma rays and including visible light, are all basically the same phenomenon. Explains that most of the properties of light are really just properties of waves, including reflection, refraction, and diffraction. Shows how ordinary light can be used to see things on a human scale, while X-rays are used to "see" things on an atomic scale. *Closed Captioned.* (CAIT;FI; c1986)

Electricity; Light; Magnetism; Waves

MISCELLANEOUS ELECTRICAL EQUIPMENT

6 min; color; h,c,a

1/2" VHS **FC1670,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: diagrammatic descriptions of the relay operation and a moving coil, meters, the function of a potentiometer in a circuit, and the rheostat. (IFB;c1982)

Electricity

MOTORS AND GENERATORS

7 min; color; h,c,a

1/2" VHS **FC1669,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: "dart notation" and direction of current, experiment with free-moving wire in a magnetic field, the "right-hand rule," diagrammatic explanation of loop of wire in magnetic field, the commutator, the simple motor, the generator, and the "left-hand rule." (IFB;c1982)

Electricity

NOVA SERIES

For descriptions see individual titles:

RACE FOR THE SUPERCONDUCTOR [FC1673]

OHM'S LAW

8 min; color; h,c,a

1/2" VHS **FC1662,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: amperes, volts and ohms; Ohm's law; $V=I \times R$ triangle; mega and kilo; milli and micro; resistors in a circuit. (IFB;c1982)

Electricity

PHYSICAL SCIENCES SERIES

For descriptions see individual titles:

ELECTRIC CURRENTS AND CIRCUITS [FC1538]

STATIC AND CURRENT ELECTRICITY [FC1542]

PSSC PHYSICS SERIES

For descriptions see individual titles:

COULOMB'S LAW [FB0570]

RACE FOR THE SUPERCONDUCTOR

58 min; color; h,c,a

1/2" VHS **FC1673,VH**

Nova Series - Examines recent research breakthroughs in high temperature superconductivity and documents the race between U.S. and foreign physicists to develop a superconductor with practical applications. Explains that, because superconductors transmit electricity with no energy lost to heat, they can have an enormous impact on the way we generate and transmit energy. Possible applications include superfast trains, compact and lightweight electric motors, more powerful yet smaller computers and particle accelerators, and, perhaps some day, efficient fusion reactors. (WGBHTV;CORT;c1988)

Electronics; Engineering; Physics

RESISTOR COLOR CODE

8 min; color; h,c,a

1/2" VHS **FC1667,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: identifying the resistors, color band identification, "body-tip-spot" coding, tolerance identification bands, and fractional values. (IFB;c1982)

Electricity

SERIES AND PARALLEL RESISTORS

9 min; color; h,c,a

1/2" VHS **FC1663,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: resistors in series, resistors in parallel, calculation of current, the effect of cross-sectional area calculation of R_t , resistance of cables, and voltage drop. (IFB;c1982)

Electricity

STATIC AND CURRENT ELECTRICITY

15 min; color; i,j,h

1/2" VHS **FC1542,VH**

Physical Sciences Series - Explores the behavior of static and current electricity. Demonstrates through animation and live-action experiments the causes, effects, and applications of static charges and their relation to an electric current and complete circuit. (CORT;c1985)

Electricity; Force and energy

WHAT IS ELECTRICITY

4 min; color; h,c,a

1/2" VHS **FC1658,VH**

Basic Electricity Series - Uses graphic illustrations and live-action sequences to identify and explain the following: the atom's electrons and protons, negative, positive, and balanced charges, free electrons, conducting and non-conducting materials, and electron flow. (IFB;c1982)

Electricity