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| <p>Principles of translational motion, velocity and acceleration as they relate to free fall and projectile motion. motions and forces such as gravitational and electrical net forces.</p> | <p><u>The mechanical universe--and beyond, #1-4</u> [videorecording] Program 1 introduces revolutionary ideas and heroes from Copernicus to Newton and links the physics of the heavens and the earth. Program 2 covers Galileo's experiments which proved that all bodies fall with the same constant acceleration. Programs 3& 4 explores the derivative as a practical tool and Galileo's law of inertia. Uses computer animation sequences, historic reenactments, and close-up photography of experiments. Motion. Dynamics. Gravity. Acceleration (Mechanics) videocassette(120 min.)</p> | <p>VT 530 MEC V.1-4</p> |
| <p>Interpret a model that illustrates circular motion and acceleration</p> | <p><u>Circular motion</u> [videorecording]. Can a person generate enough speed on a swing set to make a full revolution without falling out of the seat? The MyBusters have to obey the laws of gravity to find out if this myth is fact or fiction. The series: MythBusters 1 videodisc (8 min.) :</p> | <p>DVD 531 CIR</p> |
| <p>Describe inertia, motion, and action/reaction concepts through words, models and mathematical symbols.</p> | <p><u>Headjam.</u> Science, math and critical thinking skills come to life. These zany, brainy programs explore multi-disciplinary skills in a highly entertaining way. 5 episodes on this tape. Slinky science: Kids see gravity, inertia and centrifugal force from a whole new angle when you combine Slinky with engineering concepts (20 mins).. The series: Headjam Videodisc (108 mins.)</p> | <p>DVD 160 HEA</p> |
| <p>Know Newton's Laws of motion and gravity and apply them to solve problems related to force and mass.</p> | <p><u>Elements of Physics: Motion, Force, and Gravity</u> (56:00) When Isaac Newton formulated his three laws of motion, he transformed physics because these laws allowed precise predictions of the movement of objects at all times and in all circumstances. From this, Newton deduced the law of gravity, which explained the movement of planets and stars. This program describes these theories and goes on to outline the four fundamental forces of the universe and how Einstein revolutionized the way we understand gravity with his general theory of relativity. Teacher's Guide Blackline Masters Curriculum Standards Grade: 9-12 © 2006 United Learning This video contains 11 segments</p> | <p>United Streaming</p> |
| | <p><u>Forces</u> Mythbusters Adam Savage and Jamie Hyneman test whether it is possible for a human being to fall from a jet airliner in flight and live, and if a person can survive being hit on the head by a penny dropped from the top of a skyscraper. videodisc (24 min.)</p> | <p>DVD 531 FOR</p> |
| | <p><u>The mechanical universe--and beyond, #5-8</u> [videorecording] Program 5 deal with the issues addressed by physics:why, how much,</p> | <p>VT 530 MEC V.5-8</p> |

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| | <p>where, and which way. Program 6 covers Newton's contribution to the laws of force, mass and acceleration. Program 7 deals with Newton's and Leibniz's conclusion that differentiation and integration are inverse processes. Program 8 covers Newton's discovery that gravity describes the force between any two particles in the universe. Uses computer animation sequences, historical reenactments, and close-up photography of experiments. Dynamics. Motion. Force and energy. 1 videocassette (120 min.)</p> <p><u>The mechanical universe--and beyond, #9-12</u> Program 9 looks at the platonic theory of uniform circular motion. Program 10 explains that all physical phenomena in nature are explained in two nuclear forces, gravity and electricity. Program 11 deals with the mathematical form of gravitational, electric and magnetic forces. Program 12 presents a re-creation of Robert Millikan's classical oil-drop experiment to determine the charge of a single electron. Uses computer animation sequences, historical reenactments, and close-up photography of experiments. 1 videocassette (120 min.)</p> <p><u>The mechanical universe--and beyond, #13-16 [videorecording]</u> Program 13 deals with the law of physics which states that energy is neither created or destroyed. Program 14 deals with potential energy and the powerful model that this concept has become for understanding why the world has worked the same way since the beginning of time. Program 15 likens the universe to a perpetual clock and applies the principle of conservation of momentum to explain why the universe continues to operate. The same principle also applied to an analysis of collisions. Program 16 explains that the restoring force and inertia of any stable mechanical system causes objects to execute simple harmonic motion. Uses computer animation sequences, historical reenactments, and close-up photography of experiments. . 1 videocassette (120 min.)</p> <p><u>Newton the mind that found the future.</u> Explains Newton in his own time and dramatizes his link to modern science by showing the many contemporary applications of Newton's theory. Show him as the inventor of the law of universal gravitation, differential calculus and the reflecting telescope and as the founder of the age of science in which we live today. . 1 videocassette (21 min.)</p> | <p>VT 530 MEC V.9-12</p> <p>VT 530 MEC V.13-16</p> <p>VT 530 NEW</p> |
| <p>Identify elements of simple machines in compound machines.</p> | <p><u>Work, Energy, and the Simple Machine: Compound Machines (15:00)</u> This program shows how the six simple machines can be found in use in very complicated machines. The six simple machines are the basis for all other machines. Many examples of compound machines,</p> | <p>United Streaming</p> |

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| | machines that use two or more simple machines, are presented and analyzed. Blackline Masters Teacher's Guide Curriculum Standards Grade: 6-8 © 2001 United Learning This video contains 15 segments | |
| Determine the efficiency of mechanical systems by applying math formulas. | <u>Simply Science: Efficiency of Energy Conversions</u> (27:25) Investigates mechanical and biological systems to determine and compare efficiencies of energy conversions. By examining real and toy cars, various types of electrical power generation, and the packaging of various foods, students learn to use efficiency calculations. NOTE: No full-length video program exists for the QuickTime format. To view program, it will be necessary to select Windows Media standard format (256k version) or Windows Media Hi-Speed (700k). Blackline Masters Teacher's Guide Curriculum Standards Grade: 9-12 © 1998 United Learning This video contains 7 segments | United Streaming |
| Thermodynamic concepts to solve problems relating to energy and heat. | <u>Elements of Physics: Energy: Work and Power</u> (56:00) This program explores the many different forms of energy from sound, heat, light, and chemical energy. One of the greatest forms of energy is nuclear energy locked within the nucleus of atoms. Energy can be converted from one form to another and much of the success of our industrialized society has been in our ability to harness energy for our needs. Although classical physicists saw energy and matter as separate and distinct, modern physics has shown that the two are fundamentally linked. Blackline Masters Teacher's Guide Curriculum Standards Grade: 9-12 © 2006 United Learning This video contains 12 segments | United Streaming |
| Resistance, current and electromotive forces.(Ohms' Law) | <u>Physics: A World in Motion: Ohm's Law and Energy</u> (29:00) Students investigate the nature of resistance and its connection to safety when dealing with electric circuits. Locations interviews focus on the dangers posed by electric current, and methods of avoiding those dangers. Using Ohm's law and the power equation, students quantify the energy transfers occurring in theoretically valid situations and in laboratory experiment work. Teacher's Guide Curriculum Standards Grade: 9-12 © 1998 United Learning This video contains 6 segments | United Streaming |
| Knowledge of chemical reactions to generate electrical current. | Chemical Reactions & Electricity DVD 18 minutes \$29.95 Why are some reactions in the world around us irreversible? How is the flow of electrical energy in a complete circuit like water flowing over a waterwheel? In <i>Chemical Reactions & Electricity</i> , viewers observe chemical reactions in nature and in the laboratory to uncover the difference between physical and chemical changes. They use models and travel to huge electric plants to explore the various parts of an electrical circuit, and see how current flows to provide the power needed to keep our world in motion! Part of the | LVC V6312 \$29.95 Purchase? |

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| | <p>multivolume <i>Science Clips for Students DVD Series</i>. A teacher's guide is included and available online.</p> | |
| Parts and functions of an electrical circuit | <p><u>Physics: A World in Motion: Current Electricity</u> (29:00) Students are challenged to devise a source of potential difference from provided materials. Throughout the program, they investigate electric-current concepts by discussion, laboratory work and interviews. They complete calculations involving the change in energy for various loads in an electric circuit. Grade: 9-12 © 1998 United Learning This video contains 4 segments</p> | United Streaming |
| Wave properties of frequency, wavelength and speed as applied to sound through different media. | <p><u>Elements of Physics: Waves: Sound and Electromagnetism</u> (20:00) Energy, whether it is sound, light, heat, or some other form, is propagated as waves. This program looks at two different types of waves, longitudinal and transverse waves, and the common characteristics of all waves. sound and light waves are examined in some detail, and then the program concludes with a look at a modern theory called the wave-particle duality, which holds that all matter and energy have characteristics of both waves and particles. Blackline Masters Teacher's Guide Curriculum Standards Grade: 9-12 © 2006 United Learning This video contains 7 segments</p> | United Streaming |
| Sound effects e.g. Doppler effect, amplitude, frequency, reflection, refraction, absorption, sonar and seismic. | <p><u>Basics of Physics: Exploring Sound</u> (23:59) Sounds play an important part of our world. We can identify things from the Sounds they make or we associate certain Sounds with particular objects or activities. This program describes how our ears work and the range of vibrations we are able to detect. The speed of Sound and light are compared. The range of Sounds that various animals can make and hear are discussed as well as concepts related to echo location. Other topics include frequency, reverberation, musical instruments, and the Doppler Effect. Blackline Masters Teacher's Guide Curriculum Standards Grade: 6-8 © 2005 United Learning This video contains 10 segments</p> | United Streaming |
| Measure the motion of sound. | <p><u>Elements of Physics: Waves: Sound and Electromagnetism</u> (20:00) Energy, whether it is sound, light, heat, or some other form, is propagated as waves. This program looks at two different types of waves, longitudinal and transverse waves, and the common characteristics of all waves. sound and light waves are examined in some detail, and then the program concludes with a look at a modern theory called the wave-particle duality, which holds that all matter and energy have characteristics of both waves and particles. Grade: 9-12 © 2006 United Learning This video contains 7 segments Waves and the Movement of Energy (00:41) The Nature of Waves (02:20) Sound Waves (02:55) The Speed of Sound (02:33)</p> | United Streaming |

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| | <p>Electromagnetic Waves (03:07) Wave Interference (06:40) Video Quiz: Waves: Sound and Electromagnetism (01:16)</p> | |
| <p>Light effects. Measure motion of light.</p> <p>Wave properties of frequency, wavelength and speed as applied to light through different media.</p> <p>Characteristics of light. use them to produce heat, color, or a virtual image.</p> <p>Convex and concave mirrors and lenses change light images.</p> | <p><u>The mechanical universe--and beyond, #39-42 [videorecording]</u> Program 39 discusses James Clerk Maxwell's discovery of displacement current and how this discovery was used to produce electromagnetic waves called light. Program 40 discusses the properties of waves, including reflection, refraction, and diffraction. Explains that the properties of light are really just properties of waves. Program 41 deals with the Michelson-Morley experiment of 1887 which was designed to measure the motion of the earth through the ether. Explains why this experiment is considered the most brilliant failure in scientific history. Program 42 examines the hypothesis that if the speed of light is the same for all inertial observers, as indicated by Michelson-Morley experiment, then measurements will depend upon who does the measuring. Uses computer animation sequences, historical reenactments, and close-up photography of experiments. 1 videocassette (120 min.)</p> <p><u>Science of Light, The (Full Screen)</u> Study the sun and its properties of light and heat, and learn about light's practical application in technology. This live-action program studies waves and frequencies of light, and how these affect the way humans see things around them. The program also includes a teacher's guide. 18 minutes</p> <p><u>Basics of Physics: Exploring Light and Color (30:21)</u> We collect 95% of all our input about the world around us through our sense of sight. This program describes how our eyes work and provides information about the nature of light and color. People have been fascinated with light and eyes for a long time but their ideas have not always been correct. For instance, 2,000 years ago the Greeks thought that our eyes sent out rays of energy that struck an object and then returned to our eyes with information about the object. They thought this way because when they viewed the eyes of cats, dogs, and deer they noticed that the eyes of these animals were glowing. It was this glowing that they interpreted as a source of energy that was generated by the eyes. Today we know that our ability to see is totally dependent on reflected light. light strikes an object and then some of it is absorbed and the rest is reflected or bounces off the object. It is this reflected light that enters our eyes. Grade: 6-8 © 2004 United Learning This video contains 16 segments</p> <p><u>Light, Lenses, and Lasers (26:00)</u> This program supports Physics and Physical Science units on waves</p> | <p>VT 530 MEC V.39-42</p> <p>Purchase from LVC? W2878 \$44.95</p> <p>United Streaming</p> |

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| | <p>and their characteristic properties as it explains that light is the visible part of the electromagnetic spectrum which consists of a variety of waves from radio waves to cosmic rays. It also explores the use of concave and convex lenses and the concepts of diffraction and polarization. Grade: 6-8 © 1996 AIMS Multimedia This video contains 18 segments</p> <p><u>Exploring Light and Color (28:30)</u> Through experimentation and observation, this program explores light and color. Topics include the electromagnetic spectrum, the sources of light, the properties of light, reflection, refraction, lenses, and how human and animal eyes work. How light is used will cover lasers, their use in stores and in medicine. Fiber optics will also be discussed and demonstrated. Grade: 6-8 © 1993 United Learning This video contains 7 segments</p> | <p>United Streaming</p> <p>United Streaming</p> |
| <p>Relationship of electricity and magnetism as two aspects of a single electromagnetic force.</p> | <p><u>Understanding: Electricity (9-12) (55:59)</u> Electricity has dramatically changed lifestyles in much of the world—but how does it work? In segments that cover television technology, the harnessing of Electricity, and electromagnetic power, students examine the physical force that powers a vast array of modern devices and technologies. This program includes two feature segments and two short segments. Grade: 9-12 © 2004 Discovery Channel School This video contains 16 segments</p> <p><u>Electricity and Magnetism: Current Electricity (16:58)</u> Current electricity is the flow of electrons. To move from one place to another, current electricity needs what is called a “complete circuit.” The circuit is made up of a source of electrons, a path for the electrons to travel along, and a device to use the electricity. Grade: 6-8 © 2004 United Learning This video contains 6 segments</p> <p><u>Science Investigations: Physical Science: Investigating Electricity and Magnetism (1:10:00)</u> This library of videos contains seven segments that explore electricity and magnetism, where they’re found and how they’re used. • What Is a Scientific Investigation? (10 min.) • What Are Scientific Measurements? (10 min.) • The Scientific Method (12 min.) • Earth’s Magnetic Field (10 min.) • Exploring Lightning (8 min.) • Electricity and Magnetism (9 min.) • Electronics and Television (9 min.) Grade: 6-8 © 2004 Discovery Channel School This video contains 32 segments</p> | <p>United Streaming</p> <p>United Streaming</p> <p>United Streaming</p> |

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| <p>Atoms are composed of even smaller subatomic structures whose properties are measurable.</p> | <p><u>Physics: A World in Motion: Atomic Spectra (29:00)</u> Students observe the visible spectra of a number of gases, and in the process begin to see the analytical power of spectral analysis. This line of thought leads to a number of applications and Rutherford's model of the atom. Grade: 9-12 © 1998 United Learning This video contains 3 segments</p> | <p>United Streaming</p> |
| | <p><u>Physical Science Series: Atomic Structure and the Periodic Table (17:23)</u> A detailed examination of the structure of the atom will expose students to subatomic particles, including protons, neutrons, and electrons. Students will be know how to compute atomic numbers and learn how isotopes relate to atomic number. They will address such topics as atomic mass, as well as the electron arrangement of different elements. This information will provide background for understanding the organization of the Periodic Table. The major groups and families of the Table will be covered. The following terminology and concepts are discussed: atomic mass, atomic number, isotope, noble gas, alkali metal, and carbon family. Grade: 6-8 © 1998 United Learning This video contains 15 segments</p> | <p>United Streaming</p> |
| | <p><u>The mechanical universe--and beyond, #51-52 [videorecording]</u> Program 51 discusses how electron waves confined by electric attraction to the nucleus helped resolve the dilemma of the atom and accounted for the periodic table of the elements. The program goes on to relate that nucleon obey a kind of periodic table and that this discovery lead to the idea of quarks. Program 52 reviews the previous programs of the course and takes a look into the future. Uses computer animation sequences, historical reeanactments, and close-up photography of experiments.</p> | <p>VT 530 MEC V.51-52</p> |
| | <p><u>Elements of Physics: Matter: Atoms and Molecules (56:00)</u> All matter is made up of atoms, and atoms, in turn, are made up of electrons that swarm around a nucleus comprising neutrons and protons. This program explains the common characteristics of atoms and shows how each element is made up of atoms, which have the same number of electrons and protons. The way these different elements combine into molecules explains how a small number of elements can form into the millions of different substances that we find in the universe. Grade: 9-12 © 2006 United Learning This video contains 8 segments</p> | <p>United Streaming</p> |
| | <p><u>Elements of Chemistry: Atoms: The Building Blocks of Matter (20:00)</u> The understanding of the structure of the atom is one of the greatest achievements of modern science. Atoms are the fundamental building</p> | <p>United Streaming</p> |

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| | <p>blocks of all matter. Students explore the structure of Atoms, what holds them together, what is the composition of different elements, isotopes, and ions. Finally, the program provides an introduction to the basic ideas of Quantum Theory, and shows how the knowledge of the atom has led to an understanding of how the millions of different substances that exist in the universe are formed. Grade: 9-12 © 2003 United Learning This video contains 8 segments</p> | |
| <p>Difference between pure substances, mixtures and compounds.</p> | <p><u>Elements and compounds</u> [videorecording]. this issue provides historical perspective on how atoms and elements were uncovered. It investigates the properties of elements and compounds, including compounds comprised of different proportions of the same elements, and those comprised of different elements. The video examines the differences between solutions and suspensions, and illustrates how scientists use their knowledge about elements to address modern-day issues and problems.</p> <p><u>Mixtures: Together but Separate (19:51)</u> This program explains the difference between mixtures and compounds, and how stability is affected by the polarity of the solvent and solute. Students' understanding of the dissolving process is reinforced as the program illustrates the effects of temperature and pressure. The properties of suspensions and colloids are introduced, along with the separation of mixtures through filtering, distillation, and settling. An effective complement to units in Chemistry and Physical Science courses. Grade: 6-8 © 1996 AIMS Multimedia This video contains 15 segments</p> <p><u>Discovering the Elements (57:12)</u> Our bodies and all the world around us are made of chemical elements. Scientists have now discovered over one hundred of these elements, such as oxygen, calcium, and iron. Others are extremely rare and can only be found in small quantities in laboratories. Elements can exist in pure form, but more often they are combined into compounds and mixtures. Some are metals and others are non-metals. A few are highly reactive and burst into flame when immersed in water or exposed to air. Elements with similar properties can be grouped into families, and the families arranged in a Periodic Table. After a general introduction to the chemical elements, students are challenged to play a game in which they must identify elements based on their appearances and spoken clues. The game builds skills of observation, note-taking, and use of reference data. When played in teams, the game promotes cooperation and group discussion. The exact rules are flexible and can be altered to match the skill level of the players. Grade: 6-8 © 1996 United Learning This video</p> | <p>VT 530.4 ELE</p> <p>United Streaming</p> <p>United Streaming</p> |

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| | <p>contains 21 segments</p> <p><u>Physical Science: Elements, Compounds, and Atoms (18:41)</u> Through numerous examples, students will learn about elements and the chemical symbols used to represent them. They will also learn how elements combine to form compounds, as well as the difference between atoms and molecules. This video exposes students to the language of chemistry and to the written symbols which are used to represent elements and compounds. The major historical scientific contributions made to the atom are also discussed. Grade: 6-8 © 1998 United Learning This video contains 10 segments</p> | United Streaming |
| Distinguish between physical and chemical properties. | <p><u>Physical Science Series: Properties of Matter (18:01)</u> This program explores the many different characteristics of matter, including the chemical properties of matter, such as flammability and reactivity. It also examines some of the physical properties of matter including color, odor, texture, and shape, through beautiful visual images which students can easily understand. Much emphasis is placed on the concept of mass and weight. Volume and density are explored by looking at different types of matter such as gas, lead, marble, and feathers. Grade: 6-8 © 1998 United Learning This video contains 7 segments</p> <p><u>Matter: Form and Substance in the Universe (18:44)</u> The basic characteristics of matter are introduced, including the concepts of mass, density, weight and inertia; the differences between elements, compounds, substances, and solutions; and the different types of matter. This program strongly supports Chemistry units on the characteristics of matter, including chemical and physical properties, and the compressibility, structure and motion of particles in solids, liquids and gases. Grade: 6-8 © 1996 AIMS Multimedia This video contains 7 segments</p> | <p>United Streaming</p> <p>United Streaming</p> |
| <p>Identify substances given their melting and boiling points</p> <p>Predict the behavior of gases through the use of Boyle's, Charles' or the ideal gas law in everyday situations.</p> <p>Describe phases of matter according to the kinetic molecular theory.</p> | <p><u>Physical Science Series: Phases of Matter (18:04)</u> This program closely examines the four states of matter: solid, liquid, gas, and plasma. Water, as well as other materials, are used as examples as to why a single substance can exist in so many different forms. Through interesting visual examples of the many uses of water, students learn about viscosity, elasticity, solids, liquids, gases, phase changes, Boyle's Law, Charles' Law, vaporization, sublimation, melting, freezing, and condensation, as well as many other concepts. Grade: 6-8 © 1998 United Learning This video contains 10 segments</p> <p><u>Heat and the Changing States of Matter (19:09)</u></p> | United Streaming |

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| | <p>This program is an excellent adjunct to Physics and Physical Science units on energy transference and the states of matter. Students' understanding of the significance of energy transformations in everyday life is enhanced as the program demonstrates the thermal conductivity of various materials, and the movement of heat through solids, liquids, and gases by convection, conduction and radiation. Students learn how thermal energy causes matter to change states, expand, and contract. The heat of fusion and heat of vaporization are examined, along with the measurement of thermal energy in calories, and the concepts of kinetic and potential energy. Scenes of steel mills, solar and geothermal power plants, and wind farms illustrate these concepts. Grade: 6-8 © 1996 AIMS Multimedia This video contains 14 segments</p> <p><u>Chemistry Connections: Kinetic and Potential Energy Changes During Changes to States of Matter (29:06)</u> Graphs are generated to illustrate kinetic and potential energy changes to states of matter. Molecular animation further illustrates this concept. Defines molar enthalpy terms for phase changes and discusses STS applications. Grade: 9-12 © 1998 United Learning This video contains 4 segments</p> | <p>United Streaming</p> <p>United Streaming</p> |
| <p>Describe how fundamental science and technology concepts are used to solve practical problems</p> <p>Explain the repeating pattern of chemical properties by using the repeating patterns of atomic structure within the periodic table.</p> <p>Apply patterns as repeated processes or recurring elements in science and technology</p> <p>Examine and describe recurring patterns that form the basis of chemical periodicity.</p> | <p><u>Physical Science: Elements (20:00)</u> There are 91 naturally occurring elements, and another 25 that are created artificially. The atoms of an element are specific to that element, having a particular number of protons, neutrons, and electrons. Most elements combine with others to form compounds, such as water (hydrogen and oxygen). It's the many combinations of elements that make for the variety of substances in the world. Keeping track of all the elements would be difficult were it not for the handy periodic table, which organizes the elements by atomic structure. Hydrogen, the simplest of elements, always exists as a compound. Hydrogen fuels both stars and the rockets that reach for them. The light bulb is a study in practical elements. Because tungsten has the highest melting point of any metal, it makes the perfect material for the filaments that—once electrified—glow with white-hot light. Inside the bulb's glass is not oxygen but argon, used because it won't react with the tungsten filament. Carbon is the stuff of diamonds and the stuff of life. The process by which diamonds are created and extracted is slow and arduous. It's no wonder the flashy gems are so valued. In a fireworks display, the elements are showcased. From the propellants to the colors to the patterns, a fireworks show is a chemical extravaganza. Grade: 6-8 © 2002 Discovery Channel School This video contains 5 segments</p> <p>Introduction to the Chemical Elements (03:10) The Elements of Space Travel (03:26)</p> | <p>United Streaming</p> |

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| | <p>The Elements of Light (01:50) Carbon: The Stuff of Diamonds (03:39) The Chemistry of Fireworks (02:59)</p> <p><u>How Scientists Work: What is Pattern Discovery?</u> (22:00) Recognition of the basic patterns in nature has led to advancements in hunting, agriculture, and civilization itself. In this program, we will see that science includes the study of consistent patterns in nature and that scientific explanations explain relationships between patterns. Students also learn that their brains have been wired to recognize patterns and that pattern recognition is really fun and easy. Grade: 6-8 © 2003 United Learning This video contains 7 segments A Brief Introduction to Pattern Discovery (00:48) Part One: Kinds of Patterns (04:11) Part Two: Patterns and Early Science (03:25) Part Three: Patterns and Modern Science (04:33) Part Four: Science Facts Are Statements About Patterns (02:07) Part Five: Scientific Explanations Are Relationships Between Patterns (05:54) Video Quiz: How Scientists Work: What is Pattern Discovery? (00:40)</p> | <p>United Streaming</p> |
| <p>Recognize stable electron configurations.</p> <p>Describe how covalent bonds form and the attractions that keep atoms together in molecules.</p> <p>Relate the properties of metals to their structure.</p> <p>Describe various types of chemical reactions by applying the laws of conservation of mass and energy.</p> <p>Evaluate energy changes in chemical reactions</p> <p>Apply knowledge of mixtures to appropriate separation techniques.</p> <p>Characterize and identify important classes of compounds</p> <p>Describe materials using precise quantitative and qualitative skills based on observations</p> | <p><u>Compounds: Electromagnetic Attraction in Molecules</u> (23:30) This program supports Chemistry units on the formation of compounds by either ionic or covalent bonding. Students' understanding will be reinforced regarding the difference between groups of compounds as the program investigates and compares the physical and chemical properties of ionic and covalent compounds, chemical formulas and equations, the use of the pH scale to measure reactive strengths of acids and bases, and the Conservation of Matter. Grade: 6-8 © 1996 AIMS Multimedia This video contains 11 segments Natural and Manmade Compounds (00:30) Chemical Reactions Form Compounds (00:47) Chemical Bonding and Electron Configuration (12:52) Ions and Ionic Bonding (02:14) Covalent Bonds (03:33) Oxidation Numbers (02:54) Polyatomic Ions (01:51) Compounds: Acids and Bases (02:18) Acids and Bases: pH Scale and Indicators (01:13) Compounds: Organic Compounds (04:02) Review (00:54)</p> <p><u>Simply Science: Discovering the Elements</u> (27:14) Experiments are conducted to establish the physical and chemical properties of a number of representative elements. These elements</p> | <p>United Streaming</p> <p>United Streaming</p> |

are then grouped logically, first into metals and non-metals, then into groups based on the observation of reactions. Finally, students compare their table to Mendeleev's to confirm their findings. Grade: 9-12 © 1998 United Learning This video contains 6 segments

Classifying Matter (04:50)
 Dividing the Elements: Metals and Non-Metals (05:27)
 Chemical Properties of Metals (05:52)
 Chemical Properties of Non-Metals (05:15)
 Organizing the Elements (Mendeleev's Table) (02:23)
 Wrap It Up (00:33)

Simply Science: Reaction Equations (27:04)
 Discusses formation and decomposition reactions; how to predict and test compound classification as ionic, molecular, acid or base; how to name the compounds involved; the law of conservation of mass; and how to balance equations. A geologist explains the formation of valuable mineral compounds within the earth, mechanisms such as hydrothermal vents which concentrate minerals in locations to be extracted, and refining methods using decomposition reactions.
 NOTE: No full-length video program exists for the QuickTime format. To view program, it will be necessary to select Windows Media standard format (256k version) or Windows Media Hi-Speed (700k).
 Grade: 9-12 © 1998 United Learning This video contains 6 segments

Simply Science: Conservation Laws (27:05)
 Using the specific examples of van Helmont, Lavoisier, and Joule, students learn how the scientific method leads researchers to propose a hypothesis, design an experiment, record observations and draw conclusions. When sufficient data supports a single thesis, it can be considered a scientific law. Students then use physical and biological systems to investigate the physical and chemical aspects of kinetic and potential energy.
 NOTE: No full-length video program exists for the QuickTime format. To view program, it will be necessary to select Windows Media standard format (256k version) or Windows Media Hi-Speed (700k).
 Grade: 9-12 © 1998 United Learning This video contains 7 segments

Mixtures: Together but Separate (19:51)
 This program explains the difference between mixtures and compounds, and how stability is affected by the polarity of the solvent and solute. Students' understanding of the dissolving process is reinforced as the program illustrates the effects of temperature and pressure. The properties of suspensions and colloids are introduced,

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along with the separation of mixtures through filtering, distillation, and settling. An effective complement to units in Chemistry and Physical Science courses. Grade: 6-8 © 1996 AIMS Multimedia This video contains 15 segments

Elements of Chemistry: Acids, Bases, and Salts (20:00)

Acids and bases are two different classes of compounds that are fundamental to the functioning of our world. When they combine, acids and bases produce salts. Students explore the chemistry of acids and bases and focus on the pH scale, an ingenious measurement of the amount of acidity and basicity of compounds. The program concludes by illustrating how the level of acids and bases contribute to processes as varied as acid rain and the functioning of the cells in our bodies.

Grade: 9-12 © 2003 United Learning This video contains 9 segments

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