

# Britannica Compass

Interactive Learning Guide





Grades 9-12



**Instructions:** Click on the chapters to access lesson links



#### **Grade 9 Science**

- Matter and its States
- 2. Evaporation and Its Effects
- 3. Solutions, Suspensions, and Colloids
- 4. Elements and Compounds
- 5. Chemical Laws: Mass and Proportions
- 6. Atoms, Molecules, and Ions
- 7. Chemical Formulae and Molecular Mass
- 8. Atomic Structure and Atomic Models
- 9. Cell: The Unit of Life
- 10. Cell Structure and Function
- 11. Plant Tissues
- 12. Animal Tissues
- 13. Motion and Its Types
- 14. Graphical Representation of Motion
- 15. Forces and Laws of Motion
- 16. Gravitation
- 17. Mass and Weight
- 18. Thrust and Pressure
- 19. Work and Energy
- 20. Forms of Energy and Conservation
- 21. Sound
- 22. Reflection and Applications of Sound
- 23. Crop Production
- 24. Animal Husbandry & Livestock Management
- 25. Units of Measurement
- 26. Heat and Temperature
- 27. Light
- 28. Electricity and Electric Current

- 29. Magnetism and Electromagnetism
- 30. Chemical Reactions
- 31. Water and Its Properties
- 32. Chemical Bonds: Electrovalent and Covalent
- 33. Periodic Classification and Properties of Elements
- 34. Environmental Issues and Their Impact
- 35. Reproduction in Flowering Plants
- 36. Respiration in Living Organisms
- 37. Five Kingdom Classification
- 38. Nutrition and Digestive System
- 39. Skeletal and Integumentary System
- 40. Health, Diseases, and Immunity
- 41. Waste Managment

### **Grade 9 Social Studies**

- 1. Events and Processes
- 2. Democracy
- 3. India's geography
- 4. Physical Features
- 5. Water systems
- 6. Climate
- 7. Flora and Fauna
- 8. Population
- 9. Earth's Movements
- 10. Pollution
- 11. Tribal Societies in India



#### Grade 10 Science

- **Chemical Equations**
- **Chemical Reactions and Their Effects**
- 3. Acids and Bases
- 4. Behavior of Acids and Bases
- 5. pH and Salts in Daily Life
- 6. Chemical Products from Salt
- 7. Uses of Crystals and Salts
- 8. Metals and Non-metals
- 9. Chemical Properties of Metals
- 10. Occurrence and Extraction of Metals
- 11. Corrosion and Its Prevention
- 12. Carbon and Its Compounds
- 13. Reactivity of Carbon Compounds
- 14. Alcohols and Carboxylic Acids
- 15. Nutrition in Plants and Animals
- 16. Respiration in Living Organisms
- 17. Transportation in Human Beings
- 18. Transportation in Plants
- 19. Excretion in Living Organisms
- 20. The Nervous System
- 21. Coordination and Response in Organisms
- 22. Asexual Reproduction
- 23. Sexual Reproduction in living organisms
- 24. Reproduction in Human Beings
- 25. Heredity and Variation
- 26. Mendelian Inheritance and Trait Expression
- 27. Sex Determination
- 28. Light
- 29. Image Formation by Spherical Mirrors

- 30. Mirror Formula and Magnification
- 31. Light
- 32. Lenses
- 33. The Human Eye
- 34. Defects of Vision and Their Correction
- 35. Light
- 36. Optical Phenomena
- 37. Electricity and Electric Current
- 38. Resistance and Its Effects
- 39. Electric Current and Its Applications
- 40. Magnetic Fields and Current-Carrying Conductors
- 41. Magnetic Fields and Forces Due to Electric Currents
- 42. Ecosystems and Energy Flow
- 43. Environmental Impact and Management
- 44. Transportation in Plants
- 45. Nutrition in plants and animals
- 46. Force and Motion Concepts
- 47. Work, Energy, and Power
- 48. Machines
- 49. Light
- 50. Lenses
- 51. Optical Phenomena
- 52. Sound
- 53. Electric Current and Its Applications
- 54. Heat and Temperature
- 55. Force and Motion Concepts
- 56. Transportation in Human Beings
- 57. The Nervous System
- 58. Earth and Eclipses



#### **Grade 10 Social Studies**

- The First War of Independence, 1857
- Growth of Nationalism in India 2.
- 3. First Phase of the Indian National Movement (1885-1907)
- 4. Second Phase of the Indian National Movement (1905–1916)
- The Gandhian Era (1915–1947) 5.
- The First World War 6.
- The Second World War 7.
- United Nations and its Agencies
- 9. The Cold War
- 10. The Rise of Nationalism in Europe
- 11. Nationalism in India
- 12. The Making of a Global World
- 13. The Age of Industrialization
- 14. Print Culture and the Modern World
- 15. The Union Legislature
- 16. The Judiciary
- 17. State Government
- 18. Local Self-Government
- 19. Federalism
- 20. A Story from Mexico Olympics
- 21. Political Parties
- 22. Resources and Development
- 23. Interpretation of Topographical Maps
- 24. Climate of India
- 25. Waste Management
- 26. The Productive Mechanism
- 27. Theory of Demand and Supply
- 28. Market
- 29. Banking in India
- 30. Consumer Awareness
- 31. Development
- 32. Money and Credit
- 33. Globalisation and the Indian Economy



## **Grade 11 Biology**

- Biodiversity
- Taxonomical hierarchy 2.
- 3. Monera-Salient Features and Classification
- 4. Protista-Salient Features and Classification
- 5. Fungi-Salient Features and Classification
- 6. Kingdom Plantae and Animalia
- 7. Viruses, Viroids and Lichens
- 8. Algae
- 9. Cryptogams
- 10. Seed plants (Spermatophytes)
- 11. Body Plan and Organisational Features in Animals
- 12. Animal Diversity and Phyla
- 13. Primary Plant Organs
- 14. Morphology of Flowering Plants: From Inflorescence to Seed
- 15. Solanaceae
- 16. Plant tissues
- 17. Dicot and Monocot Plants
- 18. Body Organisation
- 19. Morpho-Anatomy of Frogs
- 20. Foundations of Cell Biology
- 21. Structural Organization of Prokaryotic Cells
- 22. Structural Organization of Eukaryotic Cells
- 23. Chemical Composition and Metabolite Analysis
- 24. Molecular Architecture of Life
- 25. Enzyme Catalysis and Regulation
- 26. Mitosis and the Cell Cycle: Phases and Significance
- 27. Phases and Significance of Meiosis
- 28. Photosynthetic Apparatus and Pigments
- 29. Light Reactions and Photophosphorylation Mechanisms

- 30. Energy Utilization and Carbon Fixation in the Calvin Cycle
- 31. Adaptations in Photosynthesis
- 32. Environmental Factors Influencing Photosynthesis
- 33. Cellular Respiration in Plants
- 34. Aerobic Energy Metabolism
- 35. Metabolic Integration of Respiration
- 36. Characteristics and Dynamics of Plant Growth
- 37. Plant Growth Regulators: Discovery, Characteristics, and Physiological Effects
- 38. Human Respiratory System and **Breathing Mechanics**
- 39. Respiratory Gas Exchange, Transport, Regulation, and Disorders
- 40. Blood and Lymph: Composition and Physiology
- 41. Human Circulatory and Cardiac Activity
- 42. Cardiovascular System: Circulation, Control, and Disorders
- 43. Renal Physiology and Urine Formation
- 44. Excretory System Functions and Disorders
- 45. Muscle Movement and Contraction Mechanism
- 46. Musculoskeletal System: Structure, Function, and Disorders
- 47. Human Neural System and Nerve Impulse Transmission
- 48. Central Nervous System: Brain Regions
- 49. Endocrine Glands and Hormonal Regulation in Humans
- 50. Hormones and their mode of action



## **Grade 11 Chemistry**

- Foundations of Matter and Chemistry
- Physical Quantities and Measurement:
- 3. Principles of Scientific Measurement and Calculation
- 4. Fundamental Laws of Chemical Combination and **Atomic Theory**
- 5. Quantitative Aspects of Chemical Composition
- 6. Quantitative Aspects of Chemical Reactions in Solutions
- 7. Discovery of Subatomic Particles
- 8. Evolution of Atomic Structure
- 9. Quantum Mechanical Foundations of **Atomic Structure**
- 10. Understanding the Hydrogen Atom: Bohr's Model and Beyond
- 11. Quantum Nature of Matter and Atomic Structure
- 12. Quantum Description of Atomic Structure
- 13. Orbital Filling Principles and Atomic Stability
- 14. Development and Modernization of **Element Classification**
- 15. Electronic Configurations and Periodic Classification
- 16. Classification of Elements: The Periodic Blocks
- 17. Periodic Trends and Chemical Behavior of Elements
- 18. Bonding-Lewis Structures and the Octet Rule
- 19. Ionic Bonding and Lattice Energy
- 20. Chemical Bonding Parameters
- 21. VSEPR Theory
- 22. Orbital Overlap and Bond Characteristics
- 23. Comprehensive Hybridisation: Types, Examples, and d-Orbital Involvement
- 24. Molecular Orbital Formation and Classification
- 25. Molecular Orbital Theory and Bonding in Homonuclear Diatomic Molecules
- 26. Understanding Hydrogen Bonds: Causes and Types
- 27. Fundamentals of Thermodynamic Systems
- 28. Thermodynamic Energy Transfer and Properties

- 29. Calorimetry
- 30. Enthalpy Changes and Thermochemical Principles
- 31. Thermochemical Enthalpies of Reaction and Change
- 32. Thermodynamic Criteria for Spontaneity
- 33. Free Energy
- **34.** States of Equilibrium in Physical and **Chemical Systems**
- 35. Chemical Equilibrium
- **36.** Dynamic Chemical Equilibria and Its Driving Forces
- 37. Fundamental Theories of Acids and Bases
- 38. Acid-Base Ionization and Equilibria
- 39. Buffer and Solubility Equilibria in Ionic Solutions
- 40. Electron Transfer in Redox Reactions
- 41. Comprehensive Understanding of Redox Reactions and Oxidation Number
- 42. Tetravalent Carbon and Molecular Shapes
- 43. Structural and Spatial Representation of Organic Molecules and  $\pi$  Bonds
- **44.** Fundamentals of <u>Organic Compound Classification</u> and Structure
- 45. Systematic Nomenclature of Organic and **Aromatic Compounds**
- 46. Isomerism and its types
- 47. Electronic Factors and Mechanisms in Organic Reactions
- 48. Techniques for Purification and Separation of **Organic Compounds**
- 49. Qualitative Detection of Carbon and Hydrogen in **Organic Compounds**
- 50. Alkanes: Structure, Preparation, Properties, and Reactivity
- 51. Alkenes: Structure, Preparation, Properties, and Reactivity
- 52. Alkynes: Structure, Preparation, Properties, and Reactivity
- **53**. Benzene and the Chemistry of Aromaticity
- 54. Benzene: Preparation, Properties, Reactivity, and Effects



## **Grade 11 Physics**

- 1. Unit and Measurement
- 2. Significant Figures and Uncertainty in Calculations
- 3. Fundamental Dimensions and SI Base Units
- 4. Kinematics of Accelerated Motion in Two Dimensions
- 5. Vector Fundamentals and Operations
- 6. Two-Dimensional Accelerated Motion
- 7. From Motion Misconception to Inertia
- 8. Newtonian Mechanics and Momentum Conservation
- 9. Forces of Resistance in Mechanics
- 10. Work-Energy Relationship in Mechanics
- 11. <u>Conservation of Mechanical Energy in Potential</u> <u>Energy Systems</u>
- 12. Power Dynamics and Collisions
- 13. Dynamics of Centre of Mass
- 14. Rotational Dynamics and Momentum Interactions
- 15. Equilibrium and Stability of Rigid Bodies
- 16. Rotational Mechanics about a Fixed Axis
- 17. Kepler's Planetary Laws
- 18. Gravitational Interactions and Effects
- 19. Gravitational Boundaries and Satellite Motion
- 20. Stress-Strain and Hooke's Law Essentials
- 21. Elastic Properties and Energy of Solids
- 22. Pressures in Fluids: Principles and Applications
- 23. Fluid Dynamics and Surface Phenomena
- 24. Heat, Temperature, and the Ideal Gas Model
- 25. Thermal Behavior of Substances
- 26. Phase Transitions and Thermal Properties of Matter
- 27. Principles of Heat Transfer and Thermal Equilibrium
- 28. Thermodynamic Laws and Energy Concepts
- 29. Thermodynamic Processes and Cycles
- 30. Thermodynamics, Molecular Insights, and Engine Efficiency
- 31. Gas Behavior and Kinetic Theory
- 32. Specific Heat and Heat Capacity of Matter
- 33. Oscillatory Motion and Molecular Dynamics
- 34. Dynamics of Simple Harmonic Motion
- 35. Nature and Behavior of Mechanical Waves
- 36. Wave Parameters and Propagation Characteristics
- 37. Wave Propagation and Superposition
- 38. Wave Interference and Resonance Phenomena

## **Grade 11 Social Studies**

- 1. Timeline I (6 MYA to 1 BCE)
- 2. Writing and City Life
- 3. Nomadic Empires
- Changes in European Culture from the Ninth Century
- 5. Timeline III (c.1300 to 1700)
- 6. The Three Orders
- 7. Changing Cultural Traditions
- 8. Industrial Revolution
- 9. Timeline IV (c.1700 to 2000)
- 10. Displacing Indigenous People
- 11. Ideas of Democracy and Citizenship
- 12. Geography as a Discipline
- 13. Origin and Evolution of the Earth



## **Grade 12 Biology**

- Plant Reproduction: Structures and Events
- Pollination and Fertilisation
- Post-fertilisation Development 3.
- 4. Human Reproductive System
- Reproductive Cycles and Gamete Formation 5.
- Reproductive Events: Fertilisation to Lactation 6.
- Reproductive Health and Its Management 7.
- Principles of Monohybrid Inheritance
- 9. Dihybrid Inheritance Patterns
- 10. Chromosomal Basis of Inheritance
- 11. Mechanisms of Sex Determination
- 12. Mendelian and Molecular Disorders
- 13. Chromosomal Disorders and Syndromes
- 14. Molecular Structure-Genetic Material
- 15. Discovery of Genetic Material
- 16. Structure, Function, and Replication of Genetic Material
- 17. Gene Expression and the Genetic Code
- 18. Gene Expression and Its Regulation
- 19. Genomics and DNA Technologies
- 20. Theories and Mechanisms of Evolution
- 21. Genetic Principles and Human Evolution
- 22. Common Infectious Diseases
- 23. Immunity and Immune System
- 24. Immunological Disorders and Vaccination
- 25. Cancer Biology
- 26. Drugs and Alcohol Abuse
- 27. Addiction, Prevention, and Control
- 28. Microbes in Food and Industrial Products
- 29. Microbes in Environmental Management
- 30. Microbes in Agriculture
- 31. Fundamentals and Tools of Recombinant **DNA Technology**
- 32. Recombinant DNA Technology Processes
- 33. Applications of Biotechnology in Agriculture
- 34. Applications of Biotechnology in Medicine
- 35. Ethical Issues with Biotechnology
- 36. Population Ecology
- 37. Interactions Among Populations
- 38. Ecosystem Structure and Energy Flow
- 39. Biodiversity and Conservation

## **Grade 12 Chemistry**

- Nature and Types of Solutions 1.
- 2. Vapour Pressure and Raoult's Law
- 3. Colligative Properties and Their Applications
- 4. Osmosis and Molecular Mass Variations
- 5. **Electrochemical Cells and Electrode Potentials**
- Conductance in Electrolytic Solutions 6.
- 7. **Electrolysis and Its Applications**
- 8. **Electrochemical Applications and Corrosion**
- 9. **Understanding Reaction Rate and Rate Laws**
- 10. Kinetics of Reaction Mechanisms
- 11. **Factors Affecting Reaction Kinetics**
- 12. Transition Elements - Position and **Electronic Configuration**
- Trends and Chemical Behaviour of 13. **Transition Metals**
- 14. Special Properties and Compounds of **Transition Elements**
- The f-Block Elements Lanthanoids and Actinoids 15.
- Nomenclature of Coordination Compounds 16.
- Isomerism in Coordination Compounds 17.
- 18. **Metal-Ligand Chemistry**
- 19. Halogenated Compounds
- 20. Haloalkanes and Haloarenes
- 21. Polyhalogen Compounds and Their Applications
- 22. Classification of Alcohols, Phenols, and Ethers
- 23. Alcohols and Phenols
- 24. Alcohols and Ethers
- 25. Carbonyl Group
- 26. Aldehydes and Ketones
- 27. Carboxyl Group
- 28. Carboxylic Acids
- 29. Amines
- 30. Diazonium Salts
- 31. Carbohydrates
- 32. Proteins
- 33. Enzymes and Vitamins
- 34. Nucleic Acids and Hormones



## **Grade 12 Physics**

- 1. Electric Charge and Electric Fields
- 2. Electric Fields and Flux
- 3. Electric Dipoles and Continuous Charge **Distributions**
- **Electric Dipoles and Charge Distributions** 4.
- 5. **Electrostatic Potential and Equipotential Surfaces**
- 6. Capacitors and Capacitance
- 7. Current and Resistance in Conductors
- 8. Electrical Energy, Power, and Cells
- 9. Circuit Analysis and Applications
- 10. Magnetic Force
- 11. Magnetic Fields Due to Currents
- 12. Magnetic Dipoles and Measuring Instruments
- 13. Bar Magnet and Magnetic Field
- 14. Magnetic Properties of Materials
- 15. Faraday's Law and Electromagnetic Induction
- 16. Inductance and AC Generator
- 17. AC Circuits
- 18. AC Power and Energy Transfer
- 19. Maxwell's Displacement Current
- 20. Electromagnetic Spectrum
- 21. Spherical Mirrors
- 22. Reflection annd Refraction
- 23. Lenses
- 24. Optical Instruments
- 25. Huygens' Principle and Wavefront Behavior
- 26. Interference of Light Waves
- 27. Diffraction and Polarisation
- 28. Photoelectric Effect
- 29. Wave nature of Matter
- 30. Rutherford's Nuclear Model
- 31. Quantization of Energy Levels and Atomic Spectra
- 32. Nucleus and Nuclear Energy
- 33. Radioactivity and Nuclear Decay
- 34. Conductors and Semiconductors
- 35. p-n Junction and Diode



#### **Grade 12 Social Studies**

1. The End of Bipolarity 26. Religious and Social Movements 2. Contemporary Centres of Power 27. An Imperial Capital: Vijayanagara 3. Contemporary South Asia 28. Peasants, Zamindars and the State 4. 29. Rebels and the Raj: The Revolt of 1857 and **International Organizations** 5. Security in the Contemporary World its Representations **Environment and Natural Resources** 30. Towards Independence and Partition: The Last 6. 7. Globalisation Phase (1935-1947) 8. Forms of Government 31. Mahatma Gandhi and the Nationalist Movement 9. The Constitution 32. Framing the Constitution: The Beginning of a 10. The Executive New Era 11. The Legislature 33. De-colonisation in Asia and Africa 12. The Judiciary 34. Cold War (1945–1991) 13. Indian Democracy 35. Protest Movements 36. Middle East: Israeli-Palestine Conflict (1916–1993) 14. Microeconomic and Macroeconomic Foundations 15. National Income 37. Human Geography 16. Theory of Income and Employment 38. Population and Human Settlements 17. Money and Banking 39. Human Development 18. Government Budget and Public Finance 40. Agricultural Activities 19. Balance of Payments and Exchange Rate 41. Resources and Economic Activities 20. Development Experience and Economic Reforms 42. Transport, Communication, and Trade 21. Current Challenges Facing the Indian Economy 43. Geographical Perspective on Issues 22. Bricks, Beads and Bones: The 44. Map Work and Data Analysis Harappan Civilization 45. Structure of India 23. Early Societies (c. 600 BCE-600 CE) 46. Landforms and Water Systems of India 24. Thinkers, Beliefs and Buildings: Cultural 47. Seasons and Climate Patterns in India Developments (c. 600 BCE-600 CE) 48. Forest Resources: Conservation and 25. Through the Eyes of Travellers **Community Efforts** 





MATTER AND ITS STATES			
Matter Matter			
Britannica School	Brit.	Britannica LAUNCH PACKS	
<u>Matter</u>	The Properties of Matter	Matter Extension	
States	of Matter		
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<u>Matter</u>	The States	of Matter	
	lid State		
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Solid	The States	of Matter	
The Liq	uid State		
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<u>Liquid</u>	The States of Matter		
The Gas	eous State		
Britannica School	Britannica LAUNCH MEKS		
Gas	The States of Matter		
Changes	in the State		
Britannica School	Britannica LAUNCH PAGKS		
<u>phase</u>	The States of Matter		
Effect of Change of Temperature			
Britannica School	Britannica LAUNCH AGKS		
<u>Matter</u>			
Effect of Change of Pressure			
Britannica School			
<u>Matter</u>			





**Interactive Learning Guide** 





chemistry

#### **ELEMENTS AND COMPOUNDS**

#### **Elements**



chemical element

Britannica LAUNCH PACKS

Atomic Structure and Elements chemical elementExtension

#### **Compounds**





chemistry

Atomic Structure and Elements | chemical element extension

#### CHEMICAL LAWS: MASS AND PROPORTIONS

#### **Law of Conservation of Mass**



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chemical bonding

**Chemical Bonding** 

chemical bonding extension

#### **Law of Constant Proportions**





chemical bonding

**Chemical Bonding** 

chemical bonding extension

#### ATOMS, MOLECULES, AND IONS

#### Structure of an Atom





atom

**Atomic Structure and Elements** 

#### **Relative Atomic Masses**



atomic-weight

#### **Atom**





atom

**Atomic Theory** 

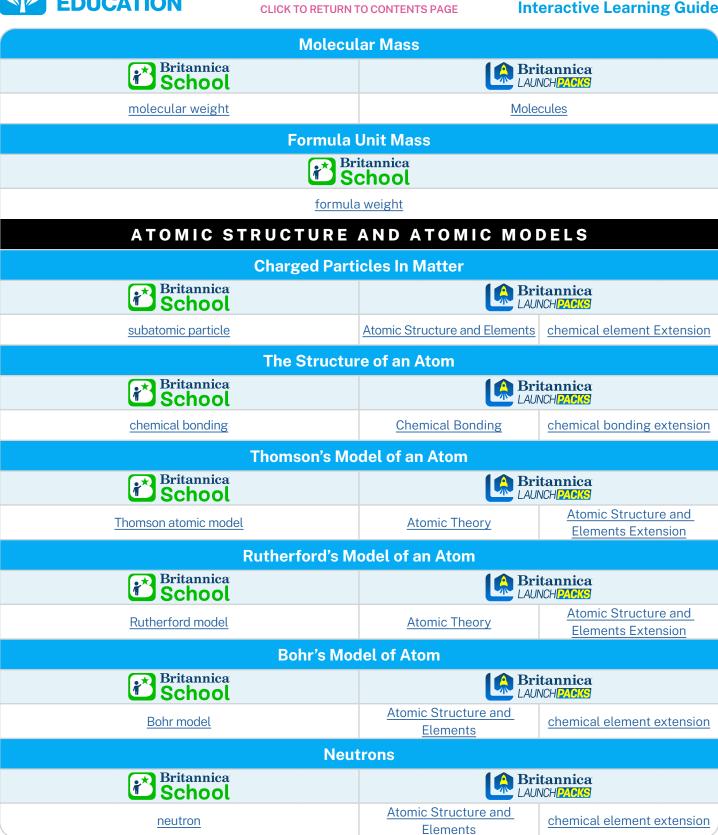
Atomic Structure and **Elements Extension** 



Symbols of Atoms		
Britannica School	<b>□</b> Br  LAU	itannica NCH <mark>PAGKS</mark>
chemical symbol	Chemical Reactions	chemical compound extension
Atom	ic Mass	
Britannica School	<b>(♣)</b> Br	itannica NCH <mark>PAGKS</mark>
atom	Atomic Theory	Atomic Structure and Elements Extension
Atomic :	Structure	
Britannica School	<b>(♣)</b> Br	itannica NCH <mark>PAGKS</mark>
atom	Atomic Structure and Elements	chemical element Extension
Mol	ecule	
Britannica School	<b>□</b> Br LAU	itannica NCH <mark>PACKS</mark>
molecule	Mole	ecules
Molecules	of Elements	
Britannica School	<b>□</b> Br  LAU	itannica NCH <mark>PAGKS</mark>
<u>chemistry</u>	Atomic Structure and Elements	chemical element Extension
Molecules o	f Compounds	
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chemistry	Comp	pounds
	on	
Britannica School	<b>□</b> Br  LAU	itannica NCH <mark>PACKS</mark>
ion	Chemical Bonding	chemical bonding extension
CHEMICAL FORMULAE	AND MOLECULAR	MASS
Writing Chen	nical Formulae	
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chemical bonding	Chemical Bonding	chemical bonding extension
Formulae of Sir	nple Compounds	
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chemical bonding	Chemical Reactions	chemical compound extension









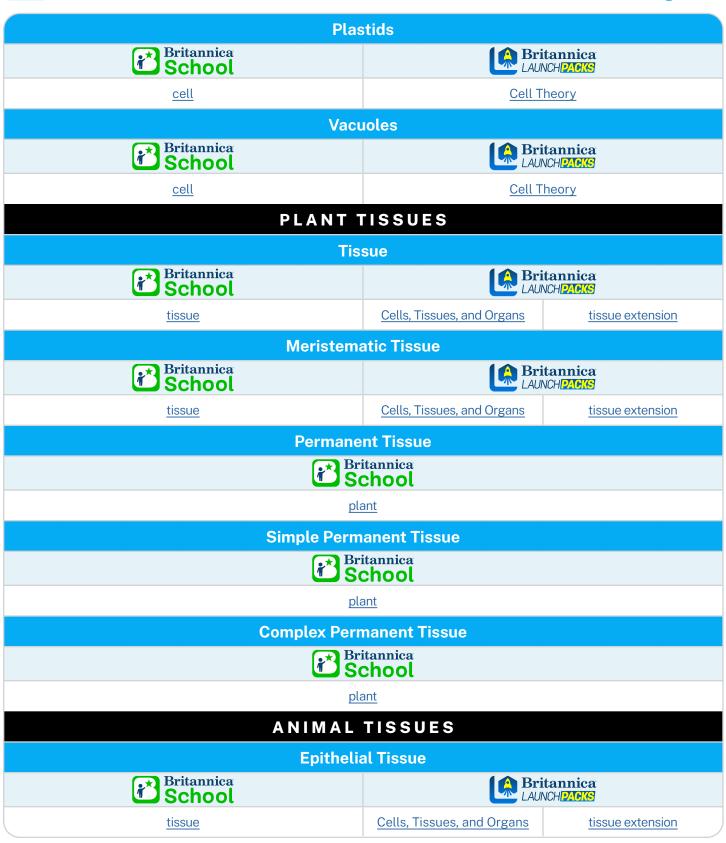


Distribution of Electrons In Different Orbits (Shells)		
Britannica School	Britannica LAUNCH	
<u>chemical element</u>	Atomic Structure and Elements	chemical element extension
Vale	ency	
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<u>chemical bonding</u>	Chemical Bonding	chemical bonding extension
Atomic	Number	
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atom	Atomic Structure and Elements	chemical element extension
Mass N	lumber	
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atom	Atomic Structure and Elements	chemical element extension
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<u>isotope</u>	The Periodic Table	chemical element extension
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iso	ba <u>r</u>	
CELL: THE UNIT OF LIFE		
Co	ell	
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cell	<u>Cell T</u>	<u>heory</u>
The Structural Organisation of A Cell		
Britannica School	Britannica LAUNCH PACKS	
cell	The Type	es of Cells

CELL STRUCTURE AND FUNCTION		
Plasma Membrane or Cell Membrane		
Britannica School	Britannica  LAUNCH PACKS	
cell	<u>Cell Theory</u>	
Cell	l Wall	
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cell	<u>Cell Theory</u>	
	cleus	
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<u>cell</u>	<u>Cell Theory</u>	
	plasm	
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<u>cell</u>	<u>Cell Theory</u>	
	ganelles	
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cell	Cell Theory	

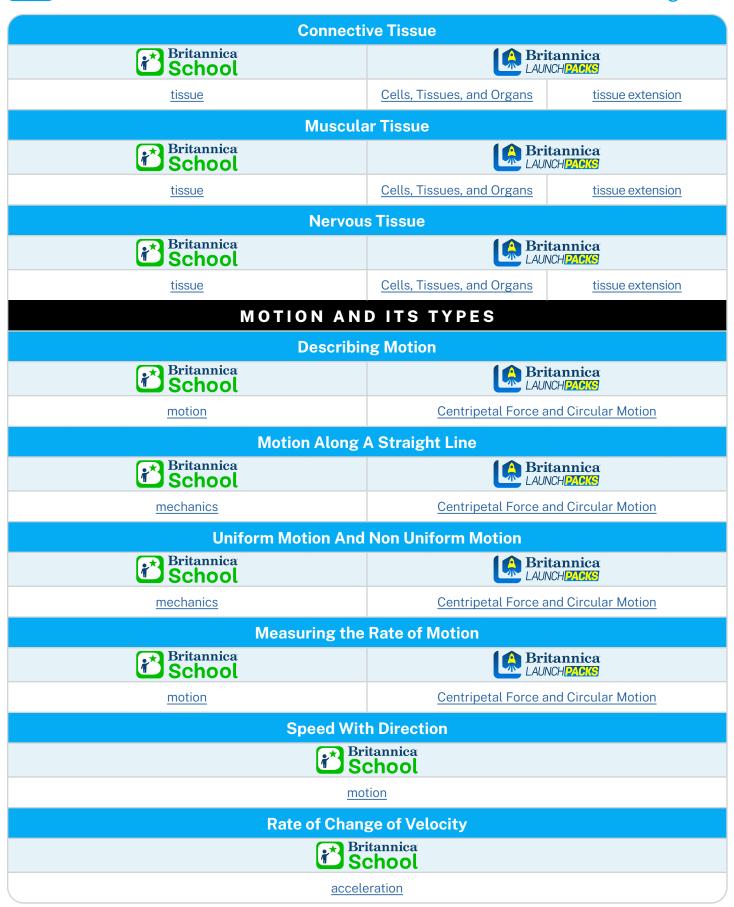






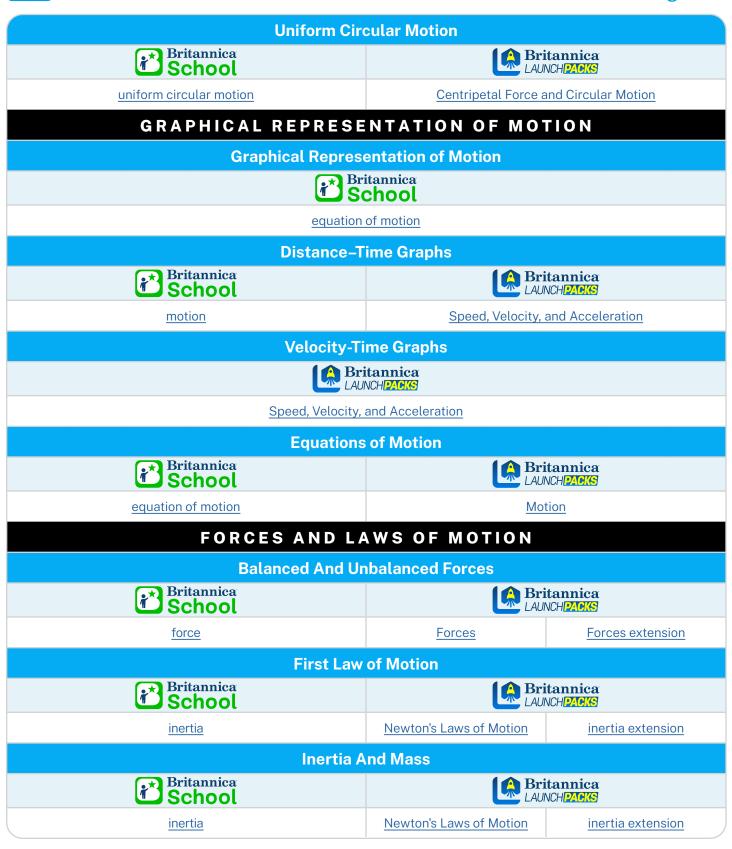




























Float	Or Sink	
Britannica School	Britannica LAUNCH PAGKS	
Archimedes' principle	Buoyant Force	Archimedes' principle extension
Archimed	es' Principle	
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Archimedes' principle	Buoyant Force	Archimedes' principle extension
WORK AN	ID ENERGY	
	hanics	
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<u>mechanics</u>	Work	and Energy
	ception Of Work	
Britannica School		Britannica LAUNCH <mark>PACKS</mark>
work	Work and Energy	
	A Constant Force	
Britannica School	Britannica LAUNCH PACKS	
<u>work</u>	Work and Energy	
	ergy	
Britannica School	Britannica LAUNCH <mark>PAGKS</mark>	
energy	Work	and Energy
	of Energy	
Britannica School		Britannica LAUNCH <mark>DACKS</mark>
<u>energy</u>	Work and Energy	
FORMS OF ENERGY AND CONSERVATION		
	Energy	
Britannica School	Britannica School Britannica LAUNCH PACKS	
kinetic energy		Motion



Potential Energy    Potential Energy   Porms   Potential Energy	CLICK TO RETURN	interactive Learning Guide	
Energy Forms  Britannica  ALANO BRITANNICA  CONSERVATION OF Energy  Law of Conservation of Energy  Britannica  CALANO BRITANNICA  CONSERVATION OF Energy  Conservation of Ener	Potential Energy		
Energy Forms    Pritannica School	Britannica School	Britannica LAUNCH PACKS	
Britannica   Conservation of Energy   Work and Energy	potential energy	Forms of Energy	
Energy  Law of Conservation of Energy  Britannica Conservation of energy  Cons	Energy	/ Forms	
Britannica School  Conservation of Energy  Conservation of energy extension  Britannica  Conservation of Energy  Conservation of Sound  Cond  Conservation of Sound  Conservation of Sound  Conservation of	Britannica School	Britannica LAUNCH	
Britannica  Conservation of energy  Conservation of Sound  Conservati	<u>energy</u>	Work and Energy	
Rate of Doing Work    Britannica School   Britannica LAUNCHILLES	Law of Conserv	ation of Energy	
Rate of Doing Work  Britannica School  Dower  SOUND  Production of Sound  Britannica School  Sound  Propagation of Sound  Britannica School  Sound  Sound  Sound  Sound  Characteristics of A Sound Wave  Britannica School  Sound  Characteristics of A Sound Wave  Britannica School  Sound  Sound  Characteristics of A Sound Wave  Britannica School  Sound  Sound  Sound  Characteristics of A Sound Wave  Britannica School  Sound  Sound  Speed of Sound In Different Media  Britannica School  Speed of Sound In Different Media	Britannica School	Britannica LAUNCH	
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cattle

Farm Mammals

#### **Poultry Farming**



poultry

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fish culture

#### **Marine Fisheries**



fish culture

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fish culture

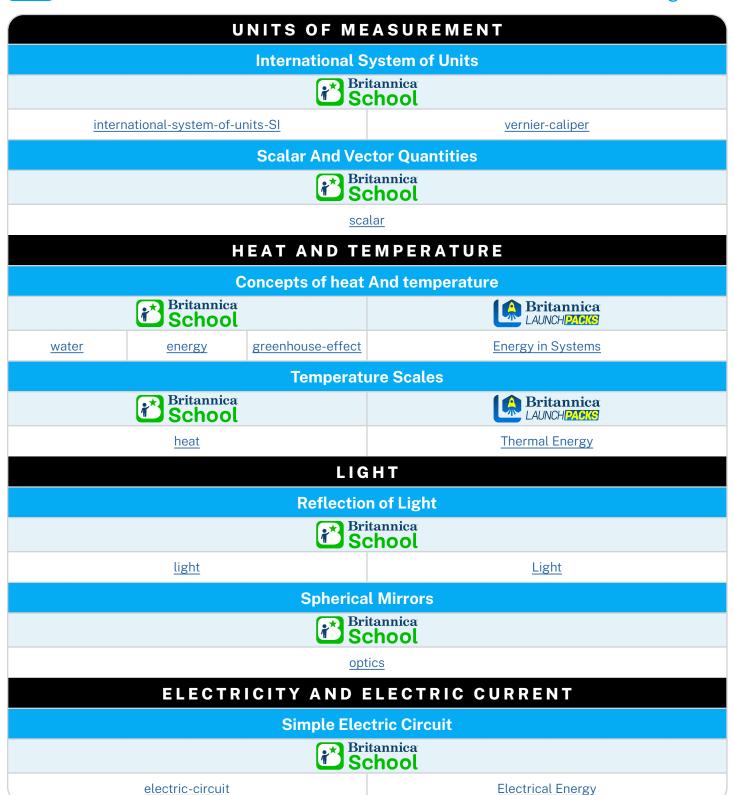
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beekeeping











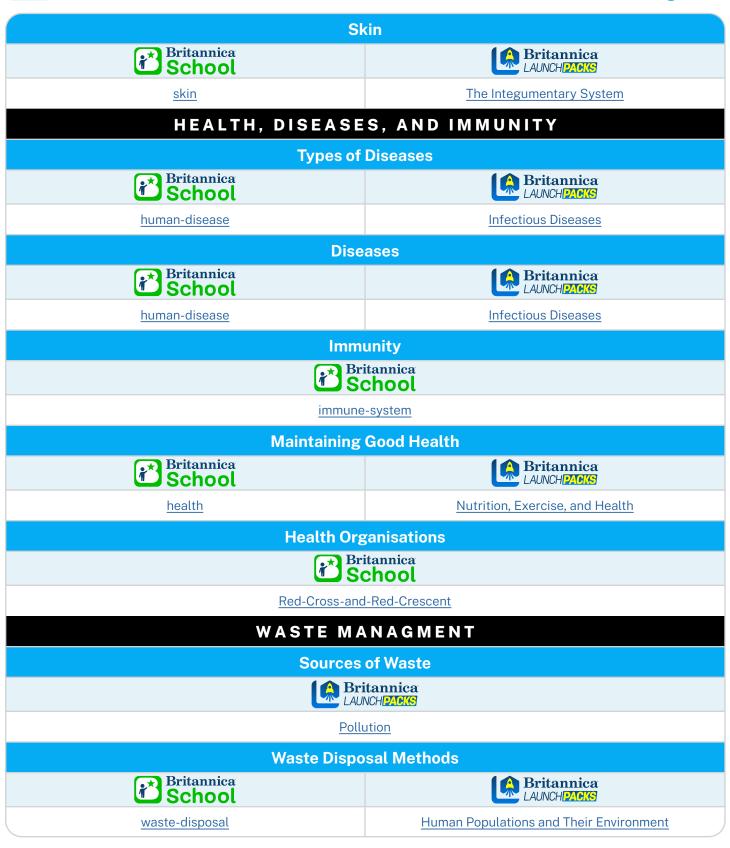


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Natural Vegetation and Wildlife

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chemical reaction

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chemical reaction

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chemical reaction

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chemical reaction

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(**)	Britannica
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chemical reaction

**Chemical Reactions** 

chemical reaction

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chemical reaction

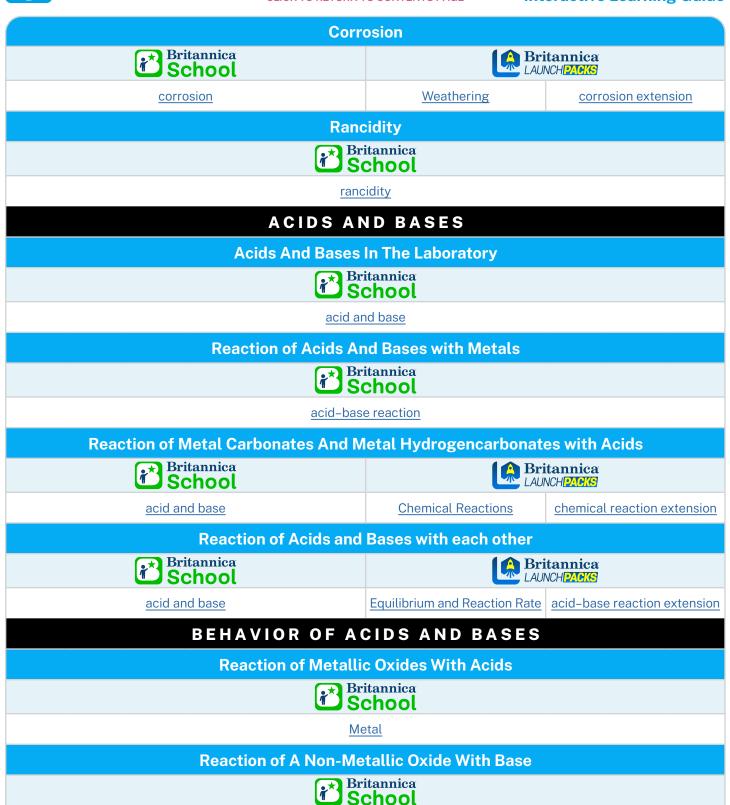
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chemical reaction





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acid and base



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acid and base

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acid and base

**Chemical Reactions** 

chemical reaction extension

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acid and base

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рН

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рН

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Lana	OCCULO	COMICO
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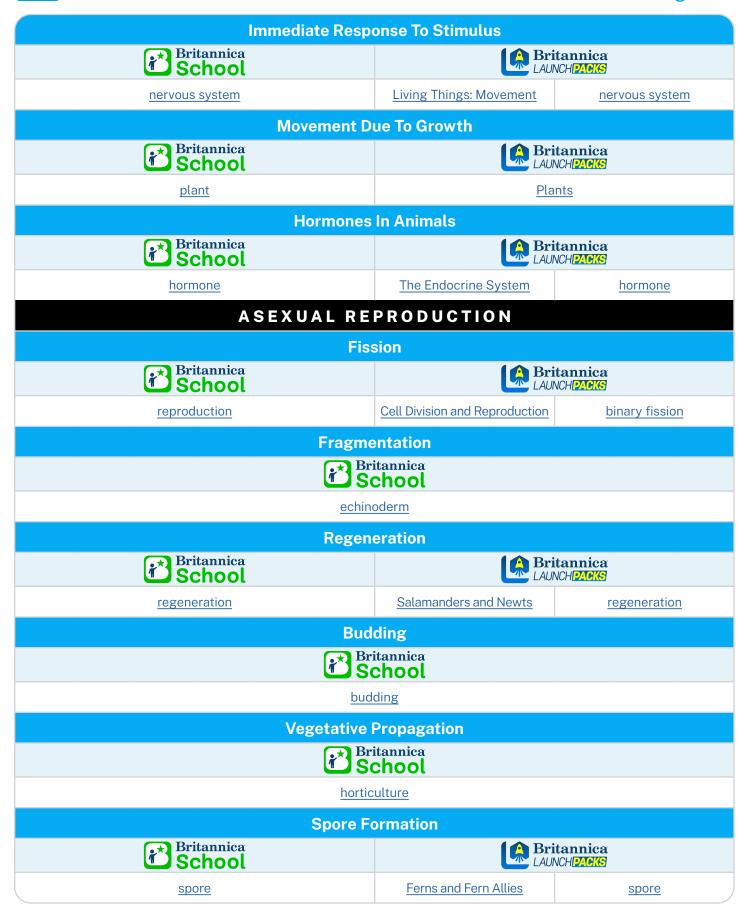


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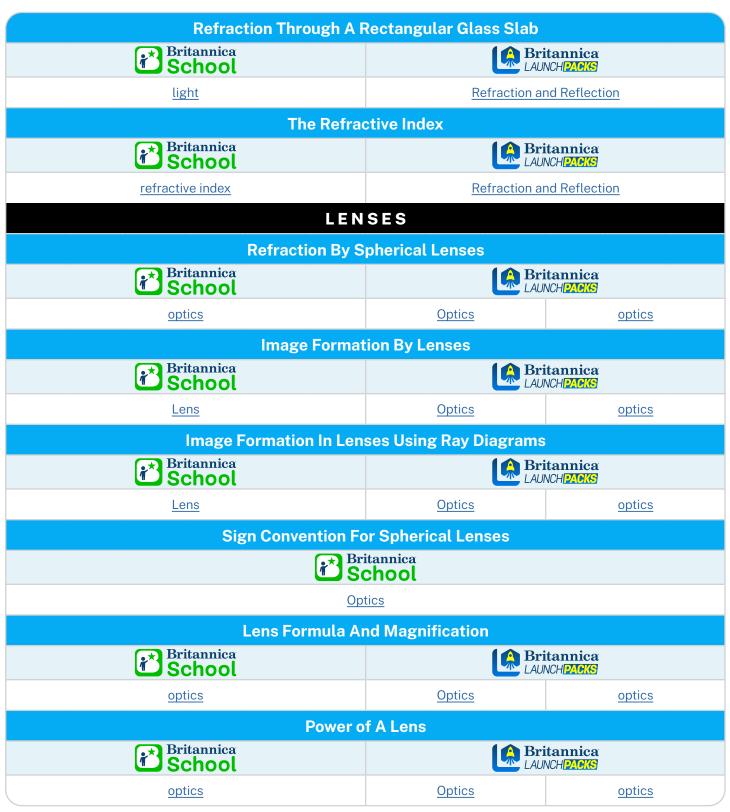
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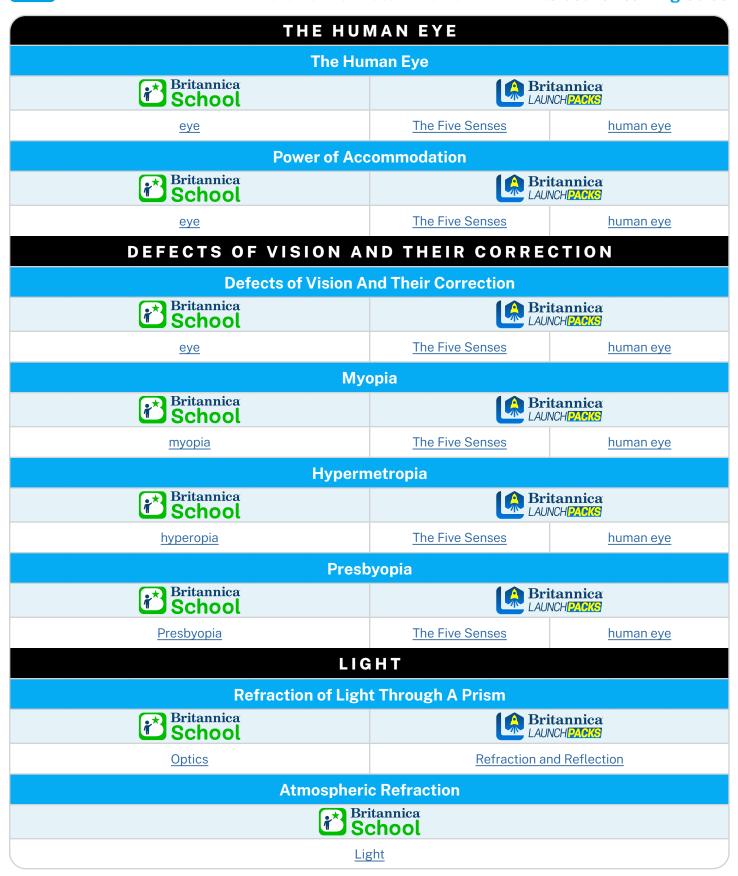




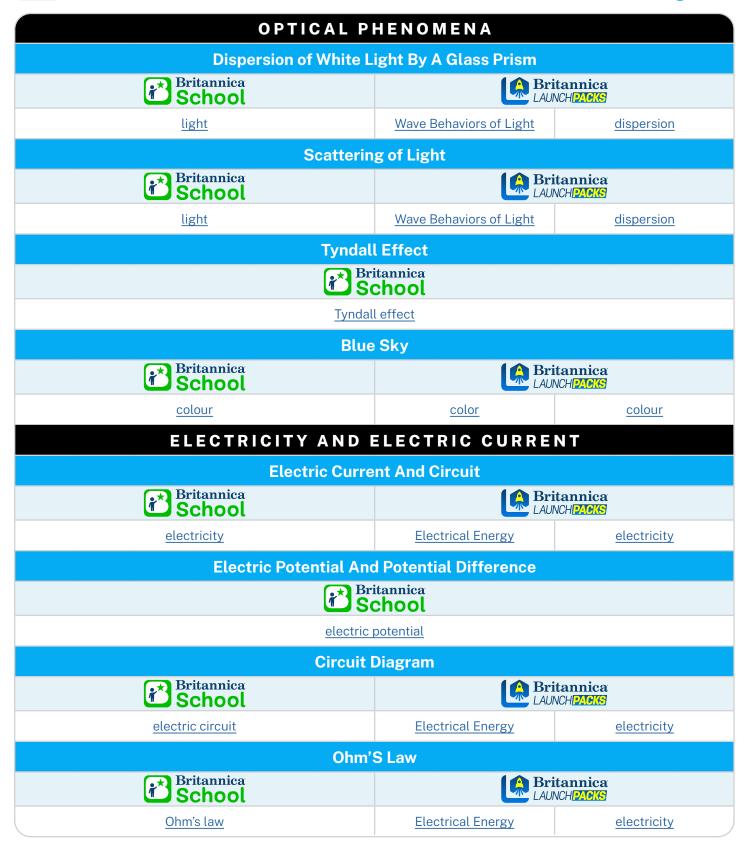
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electric circuit

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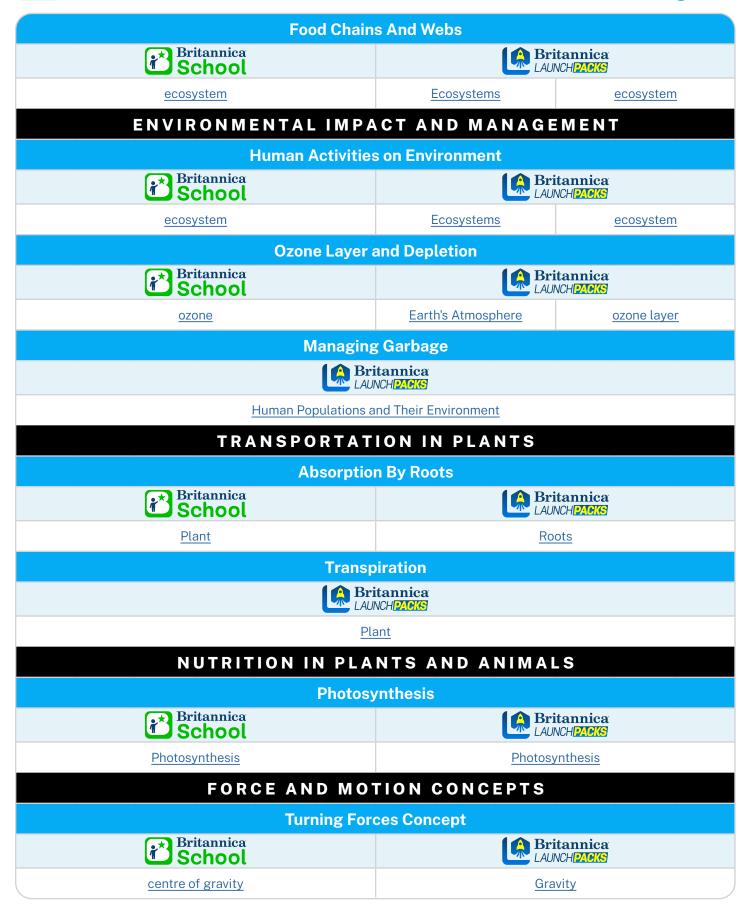




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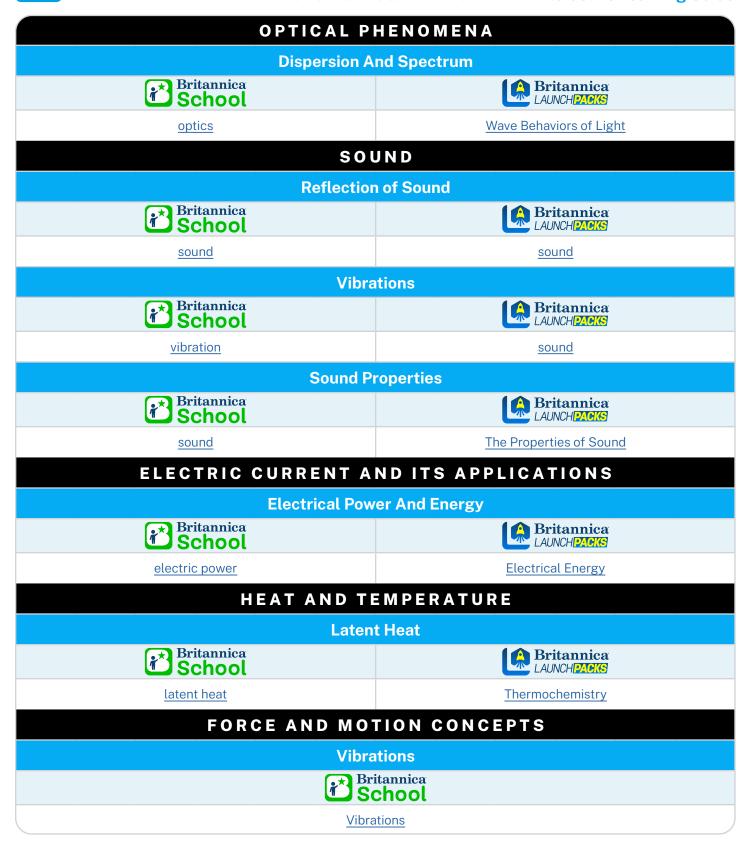


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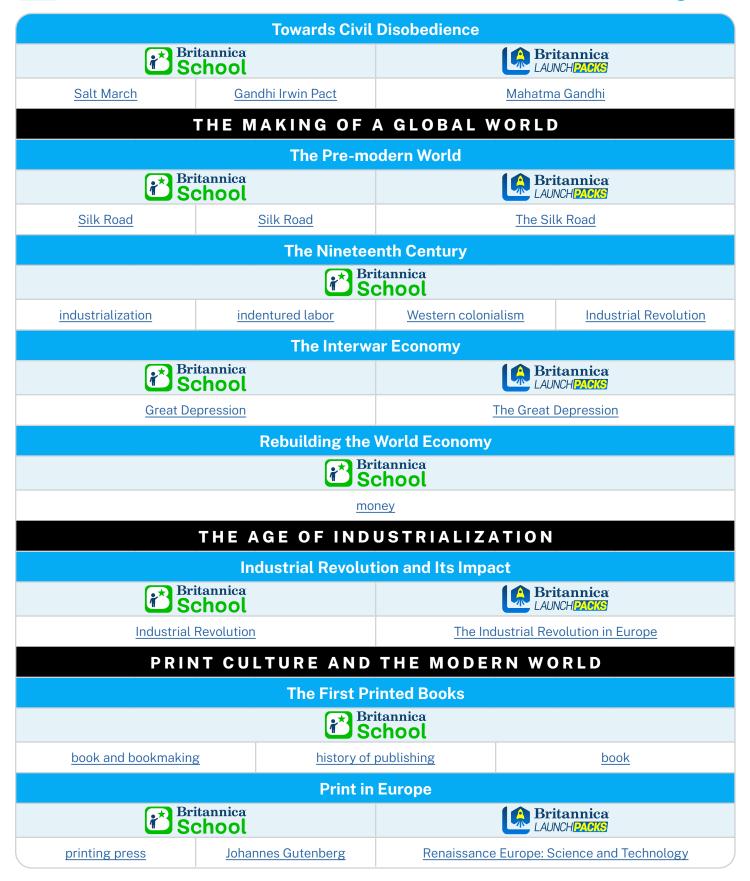


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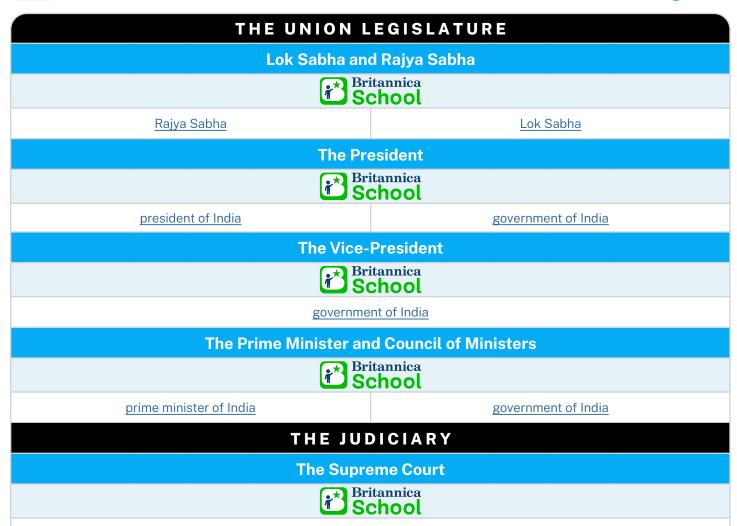
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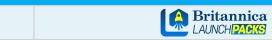


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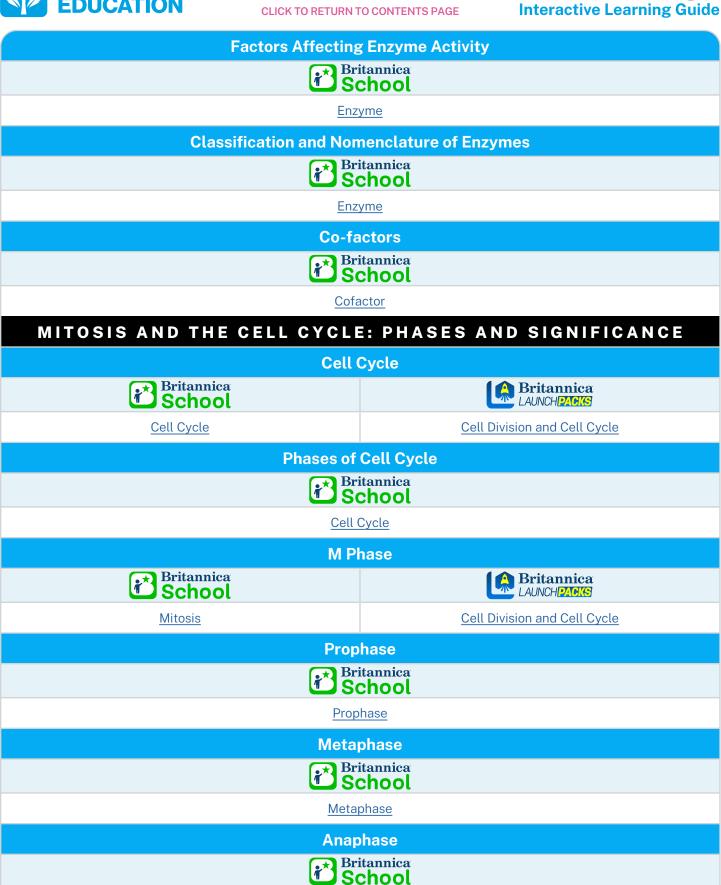


Plant Chemicals: Tasty and Terrifying" transcript

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Cellular Respiration



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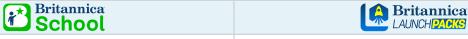
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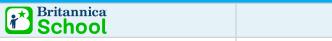
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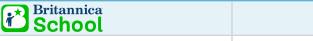
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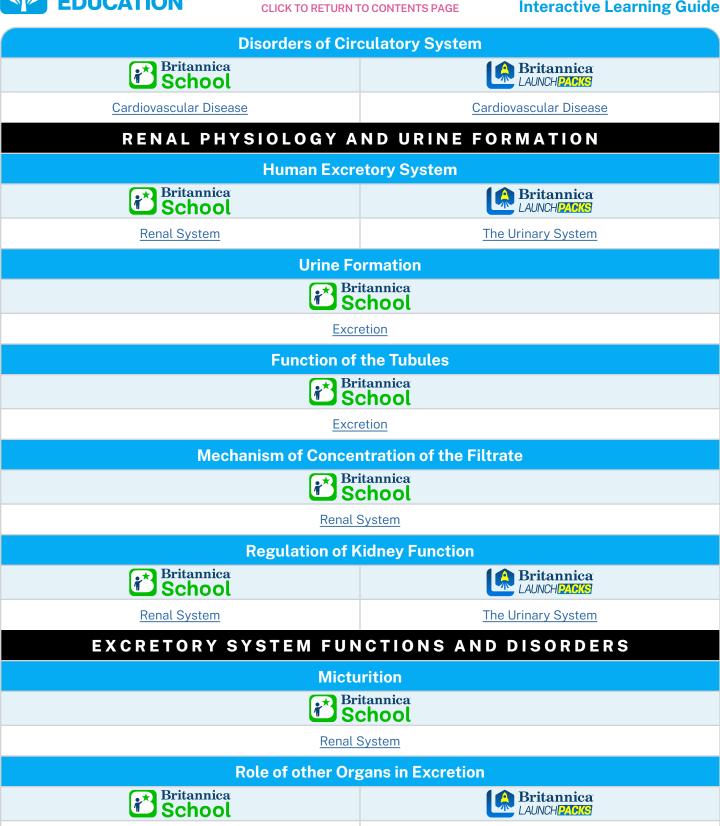


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Law of Multiple Proportions

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molecular weight molecular weight atomic mass mass number

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### Mass per cent or weight per cent (w/w %)



liquid

#### Mole fraction



Liquid

#### **Molarity**



Liquid

### DISCOVERY OF SUBATOMIC PARTICLES

#### **Discovery of Sub-atomic Particles**





Subatomic particle

**Atomic Structure and Elements** 



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J.J. Thomson

**Atomic Structure and Elements** 

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Atomic Structure and Elements

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Millikan oil-drop experiment

**Atomic Structure and Elements** 

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Proton

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Atomic Model

**Atomic Theory** 

#### **Thomson Model of Atom**





Atomic Model

**Atomic Theory** 

#### **Rutherford's Nuclear Model of Atom**

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Rutherford model

**Ernest Rutherford** 

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<u>Atom</u>

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UNDERSTANDING THE HYDROGEN ATOM: BOHR'S MODEL AND BEYOND

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**Quantum Mechanics** 

Niels Bohr

QUANTUM NATURE OF MATTER AND ATOMIC STRUCTURE

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**Quantum Mechanics** 

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Quantum Mechanics

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**Chemical Bonding** 

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**Chemical Bonding** 



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orbital

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**Electronic Configuration** 

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Pauli Exclusion Principle

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chemical bonding electronic configuration periodic table atom

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Periodic table



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Periodic table

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Periodic table

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organometallic compound

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Alkali Metal

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organometallic compound

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**Transition Metal** 

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Lanthanide

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Metal

Nonmetal

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**Ionization Energy** 

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Electronegativity

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#### **Periodicity of Valence or Oxidation States**



Periodic Table

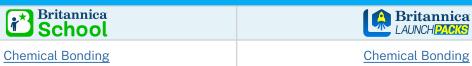
#### **Periodic Trends and Chemical Reactivity**



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### **BONDING - LEWIS STRUCTURES AND THE OCTET RULE**

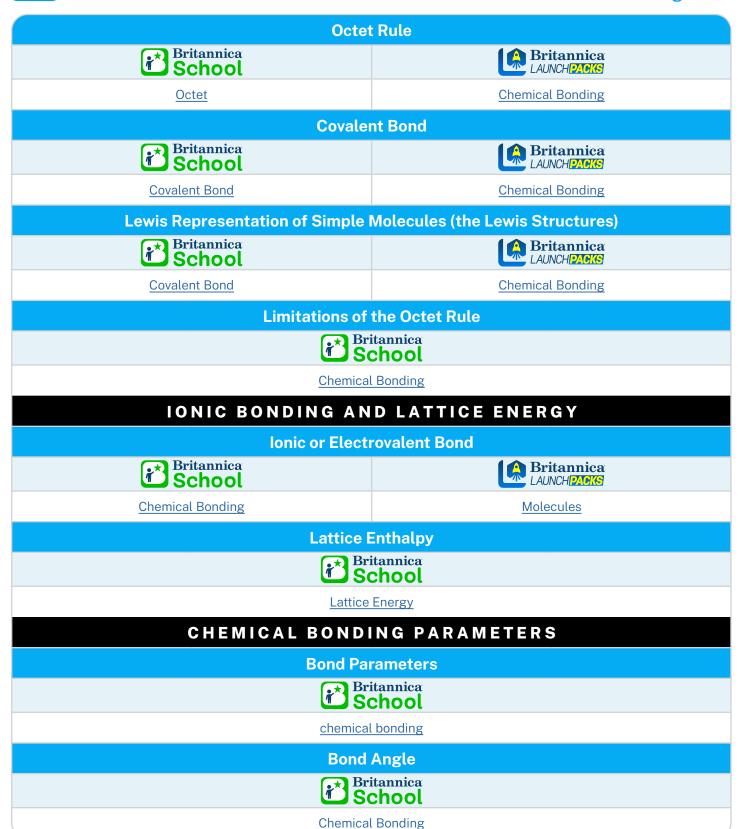
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chemical bonding

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Thermodynamics

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Thermodynamics



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free energy

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Chemistry

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chemical equilibrium

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chemical equilibrium

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chemical equilibrium

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chemical equilibrium

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chemical equilibrium



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chemical equilibrium

**Ionic Equilibrium in Solution** 



chemical equilibrium

common ion effect

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Acid-Base reaction

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common ion effect

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рН

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Acid-base reaction

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Acid-base reaction

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Acid-base reaction

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Buffer



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Oxidation Number

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**Organic Compound** 

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Hydrocarbon

Acyclic or open chain compounds



**Hydrocarbon** 

Cyclic or closed chain or ring compounds



Hydrocarbon

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Organic Compound

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Homologous Series

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Hydrocarbon

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Hydrocarbon

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Hydrocarbon

### Nomenclature of Substituted Benzene Compounds



Hydrocarbon

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Isomerism

#### Structural Isomerism



Isomerism

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Isomerism

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Reaction Mechanism

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Sublimation

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Separation and Purification

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**Separation and Purification** 

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Separation and Purification

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Qualitative Chemical Analysis

# ALKANES: STRUCTURE, PREPARATION, PROPERTIES, AND REACTIVITY I

# Classification Britannica School Hydrocarbon Organic Chemistry Alkanes

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Hydrocarbon Compounds

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#### **Nomenclature and Isomerism**



Hydrocarbon

#### **Physical properties**



Hydrocarbon

#### Chemical properties



Hydrocarbon

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Isomerism

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**Chemical Compound** 

#### Structure of Double Bond



**Chemical Bonding** 

#### Nomenclature



Hydrocarbon

#### Isomerism



Hydrocarbon

#### **Preparation**





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Hydrocarbon

#### **Chemical properties**



Hydrocarbon

# ALKANES: STRUCTURE, PREPARATION, PROPERTIES, AND REACTIVITY

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Organic Compound

#### Nomenclature and Isomerism



Hydrocarbon

#### Structure of Triple Bond



**Chemical Bonding** 

#### **Preparation**



Hydrocarbon

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Hydrocarbon

# Chemical properties





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### BENZENE AND THE CHEMISTRY OF AROMATICITY

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carboxylic acid

benzene

#### Nomenclature and Isomerism



Hydrocarbon

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Hydrocarbon

#### Resonance and stability of benzene



**Chemical Bonding** 

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Hydrocarbon

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Benzene

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Benzene

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Reaction Mechanism

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carboxylic acid



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The international system of units



Measurement System

Base units - CGS, FPS, MKS System



International System of Units (SI)

SI Units



International System of Units (SI)

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Significant figures

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error

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error

**Determining the Uncertainty in the Results of Arithmetic Calculations** 



error

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**Dimensions of physical quantities** 



Mechanics



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Length, area, and volume

#### Mass [M]



Mass

#### Time [T]



Time

#### **Electric Current [A]**



**Electric Current** 

#### Thermodynamic Temperature [K]



Measurement system

#### **Luminious Intensity [cd]**



**Luminious Intensity** 

#### **Amount of Substance [mol]**



Measurement system

KINEMATICS OF ACCELERATED MOTION IN TWO DIMENSIONS	
Velocity	
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<u>velocity</u>	Speed, Velocity, and Acceleration
Average velocity	
Britannica School	Britannica LAUNCH PAGE
<u>velocity</u>	Speed, Velocity, and Acceleration





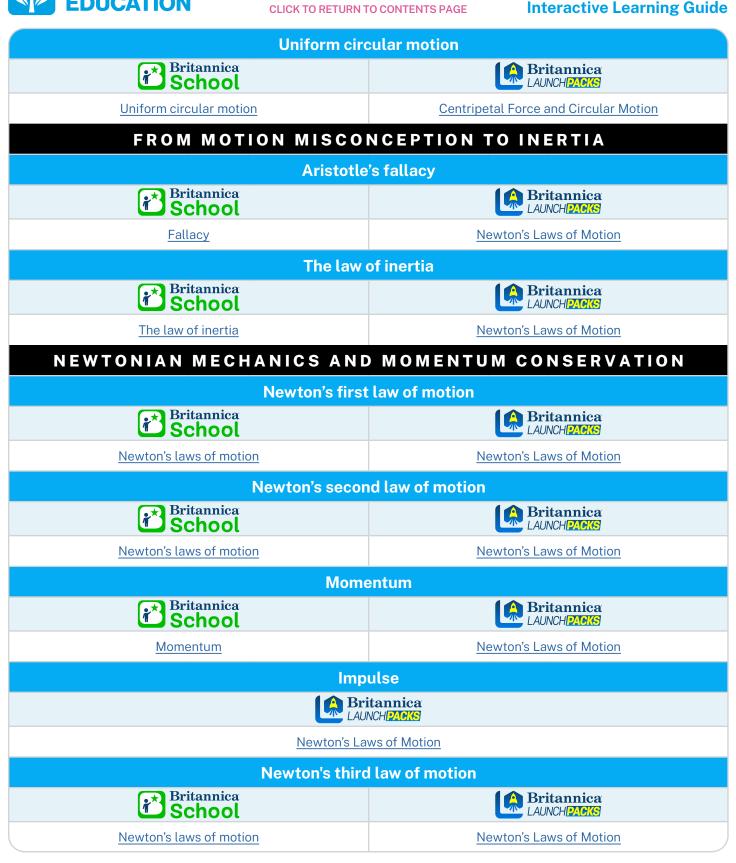
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Instantaneous velocity		
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Speed, Velocity, and Acceleration		
	eed	
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velocity	Speed, Velocity, and Acceleration	
	e Speed	
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velocity	Speed, Velocity, and Acceleration	
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Kinematic equations for uniformly accelerated motion		
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<u>Acceleration</u>	Speed, Velocity, and Acceleration	
Relative velocity		
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Speed, Velocity, and Acceleration		



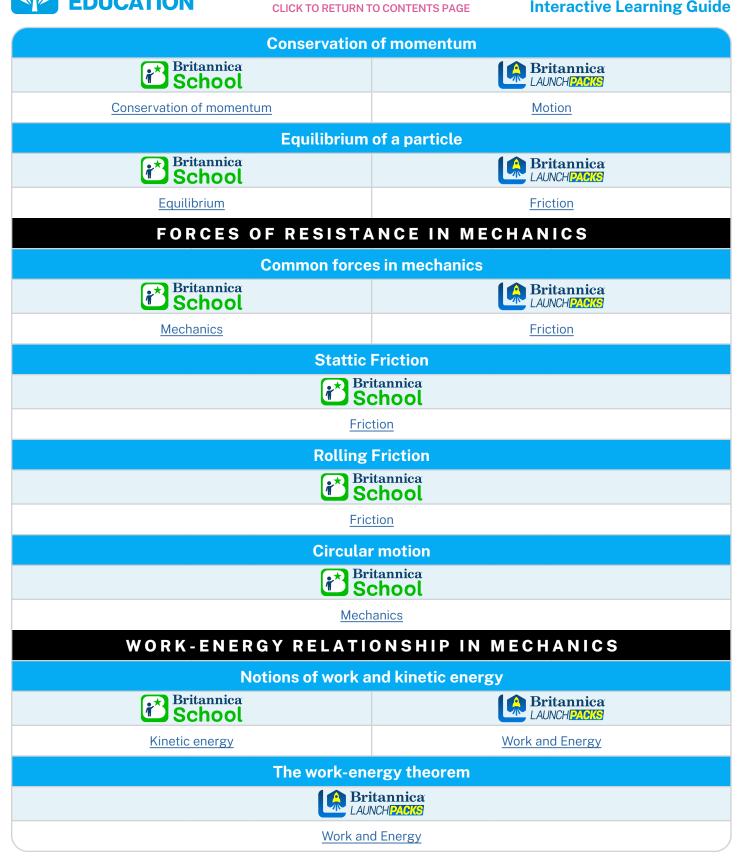














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Work	
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Kinetic	energy
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Work done by a variable force	
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Power	
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<u>Power</u>	





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Collisions

**Chemical Thermodynamics** 

#### **Collisions in One Dimensions**



Collisions

#### **Collisions in Two Dimensions**



Collisions

### DYNAMICS OF CENTRE OF MASS

#### **Centre of mass**



Mechanics

#### Motion of centre of mass



Mechanics

# ROTATIONAL DYNAMICS AND MOMENTUM INTERACTIONS

#### **Vector product of two vectors**



Mechanics

#### Angular velocity and its relation with linear velocity



Angular velocity

#### **Torque and angular momentum**



Torque and angular momentum





**Interactive Learning Guide** 

### **Moment of force (Torque)**



Torque and angular momentum

#### Angular momentum of a particle



Torque and angular momentum

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Equilibrium

#### **Centre of Gravity**



Centre of Gravity

# ROTATIONAL MECHANICS ABOUT A FIXED AXIS

#### Moment of inertia



Moment of inertia

#### Kinematics of rotational motion about a fixed axis

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Mechanics Centripetal Force and Circular Motion

#### Dynamics of rotational motion about a fixed axis

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Centripetal Force and Circular Motion Mechanics

#### Angular momentum in case of rotation about a fixed axis

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Centripetal Force and Circular Motion Angular momentum



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Conservation of angular momentum

#### **KEPLER'S PLANETARY LAWS**

#### Kepler's laws





Celestial mechanics

**Astrophysics** 

#### Law of orbits



Celestial mechanics

#### Law of areas



Celestial mechanics

#### Law of periods



Celestial mechanics

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#### Universal law of gravitation





Newton's law of gravitation

Gravity

#### The gravitational constant



The gravitational constant

#### Acceleration due to gravity of the earth



Gravity

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Acceleration due to gravity below and above the surface of earth



Gravity

#### GRAVITATIONAL BOUNDARIES AND SATELLITE MOTION

Earth satellites



Earth satellite

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Stress and strain



Mechanics of Solids

Types of stress



stress

Types of strain



Strain

Stress-strain curve



mechanics of solids

strain

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Elastic moduli



Mechanics of Solids

Young's modulus



Young's modulus



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bulk-modulus

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Shear modulus

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mechanics of solids

Young's modulus

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mechanics of solids

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mechanics of solids

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Pressure

Blaise Pascal

### Pascal's law and its applications



Pascals-principle

#### **Atmospheric Pressure and Gauge Pressure**



atmospheric-pressure

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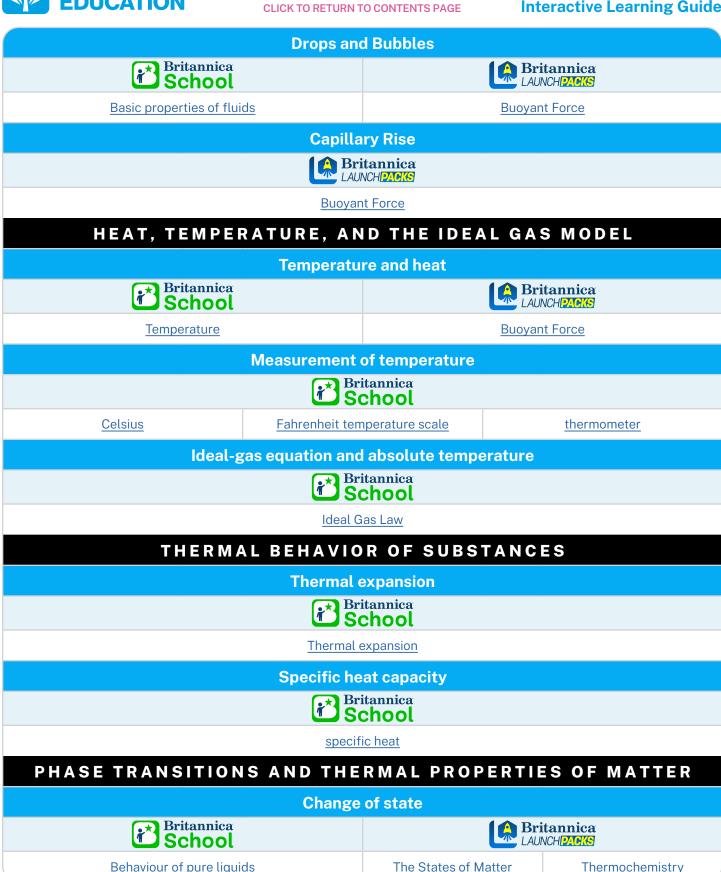


hydraulic-transmission

FLUID DYNAMICS AND SURFACE PHENOMENA	
Stream	nline Flow
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<u>liquid</u>	Buoyant Force
Angle of Contact	
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Buoyant Force	









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**Melting Point** 

#### **Freezing Point**



Freezing Point

#### **Boiling Point**



**Boiling Point** 

#### **Vaporization**



Vaporization

#### **Triple Point**



**Triple Point** 

#### **Latent Heat**



**Latent Heat** 

### PRINCIPLES OF HEAT TRANSFER AND THERMAL EQUILIBRIUM

# Heat transfer



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Heat transfer

Thermochemistry

#### Conduction



Conduction

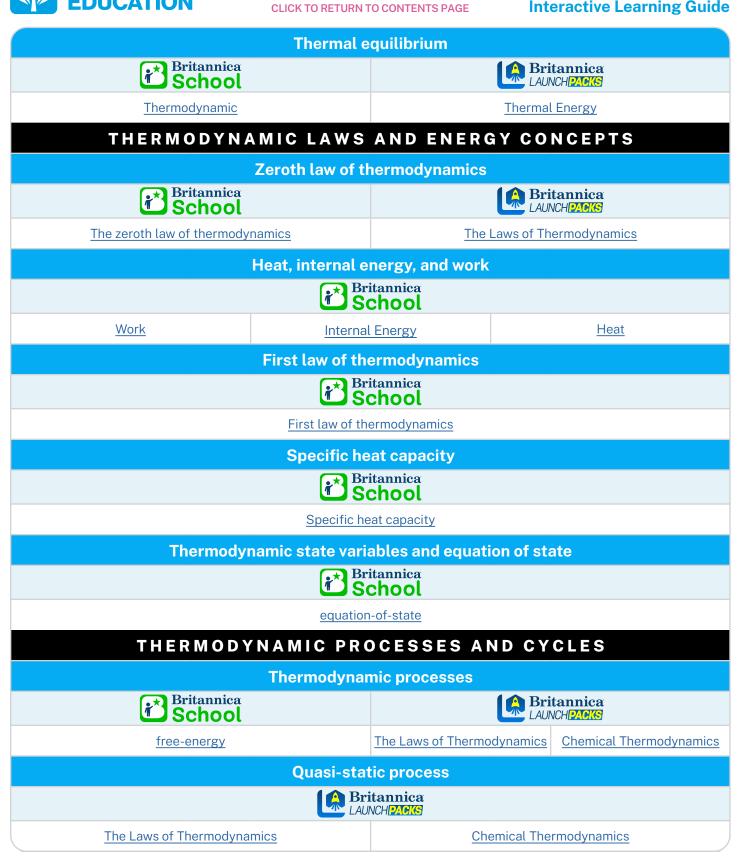
#### Radiation



**Radiation** 















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**Monatomic Gases** 





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Crystal

# OSCILLATORY MOTION AND MOLECULAR DYNAMICS

#### Mean free path





Mean free path

The States of Matter

#### **Vibrations**





**Vibrations** 

Motion

# Period and frequency





Frequency

Period

Motion

#### **Displacement**





displacement

Motion

# DYNAMICS OF SIMPLE HARMONIC MOTION

#### Simple harmonic motion (SHM)





Simple harmonic motion (SHM)

Motion

#### Velocity and acceleration in SHM



Motion

#### Force law for SHM





mechanics

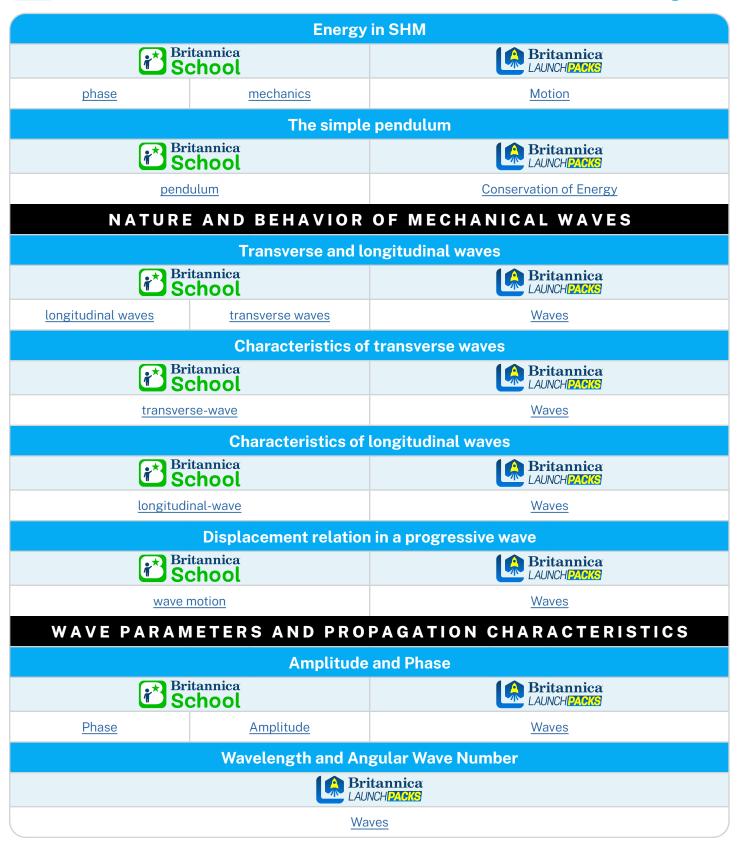
Motion





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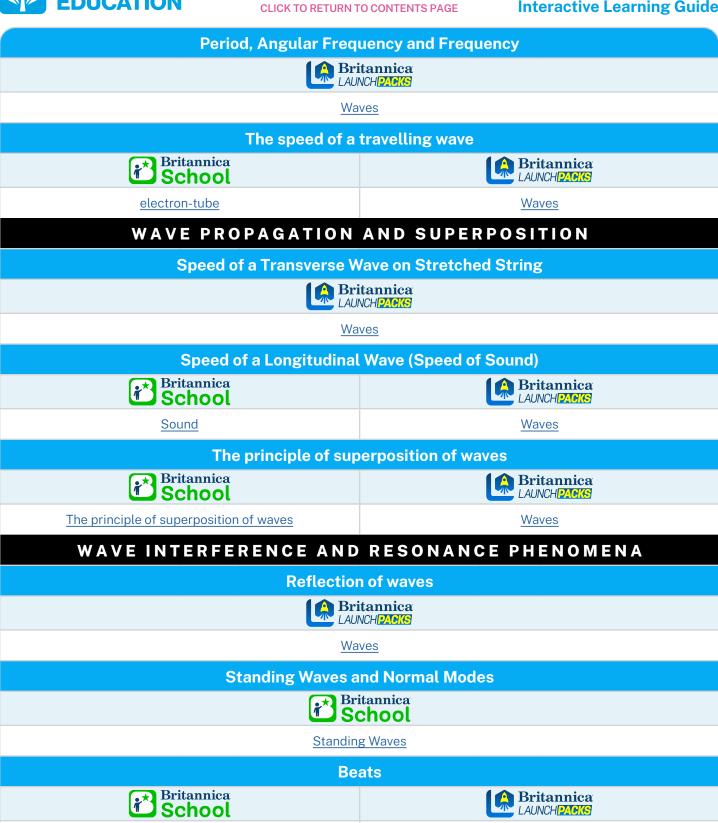


**Beats** 



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Sound



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	TIMELINE I (6	MYA TO 1 BCE)	
World in Transition: Early Civilisations and Cultural Growth			
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coin	origins of agriculture	Early Civilizations of China: Achievements Buc	
hieroglyph	human evolution	Early Civilizations of India: Key Empires	Human Origins
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	Br S	itannica Chool	
	history of N	<u>Mesopotamia</u>	
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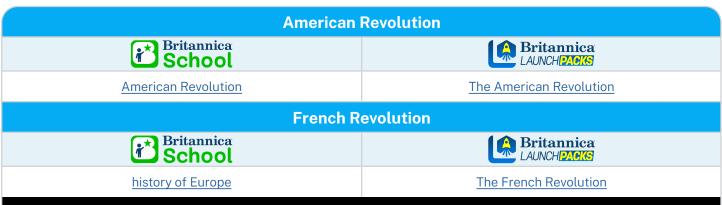
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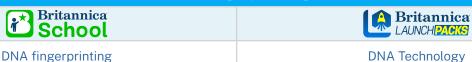
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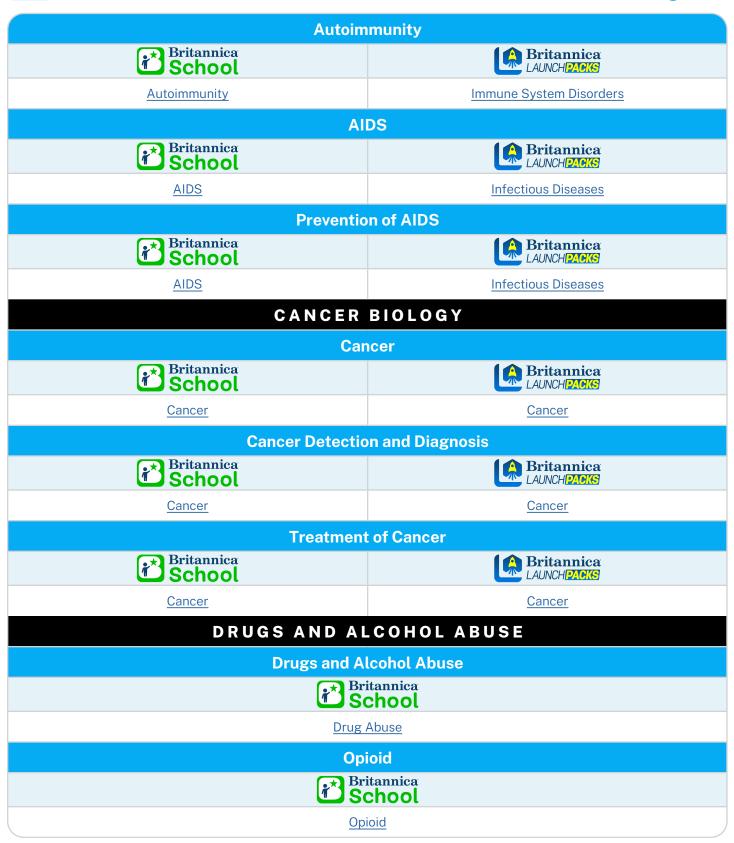
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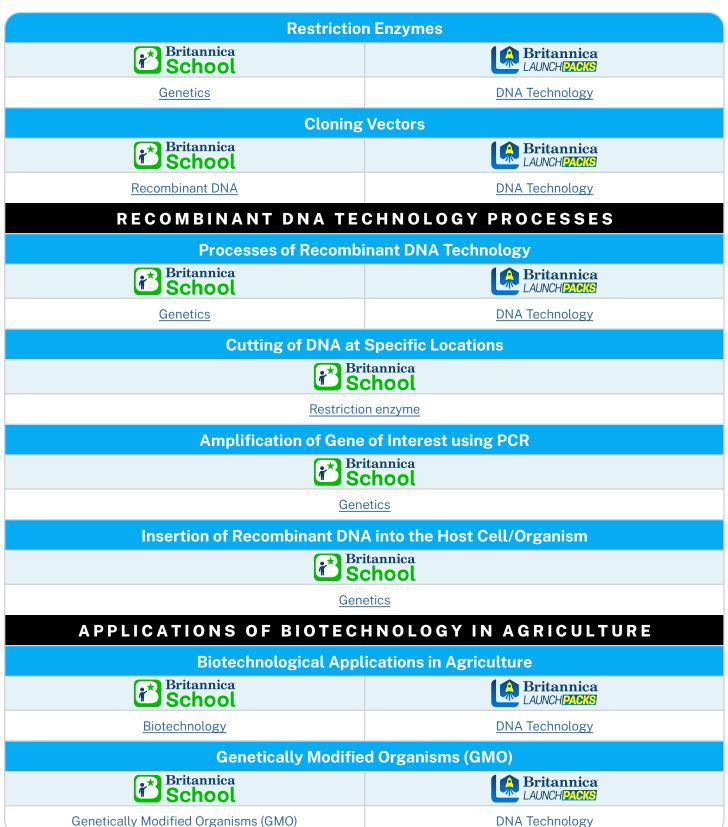
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🔼 Britannica LAUNCH PACKS

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Tetrachloromethane (Carbon tetrachloride)

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Freons

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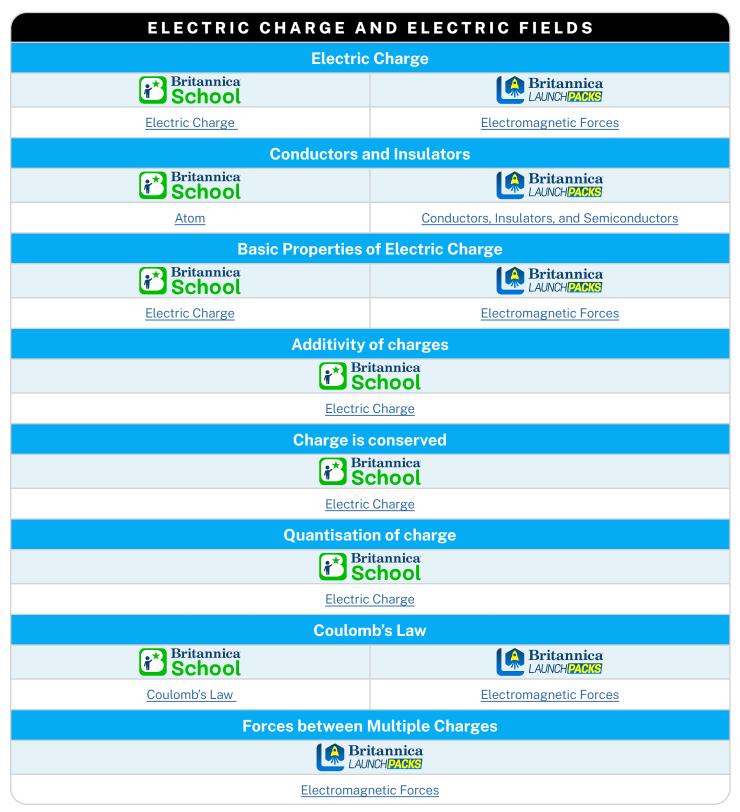
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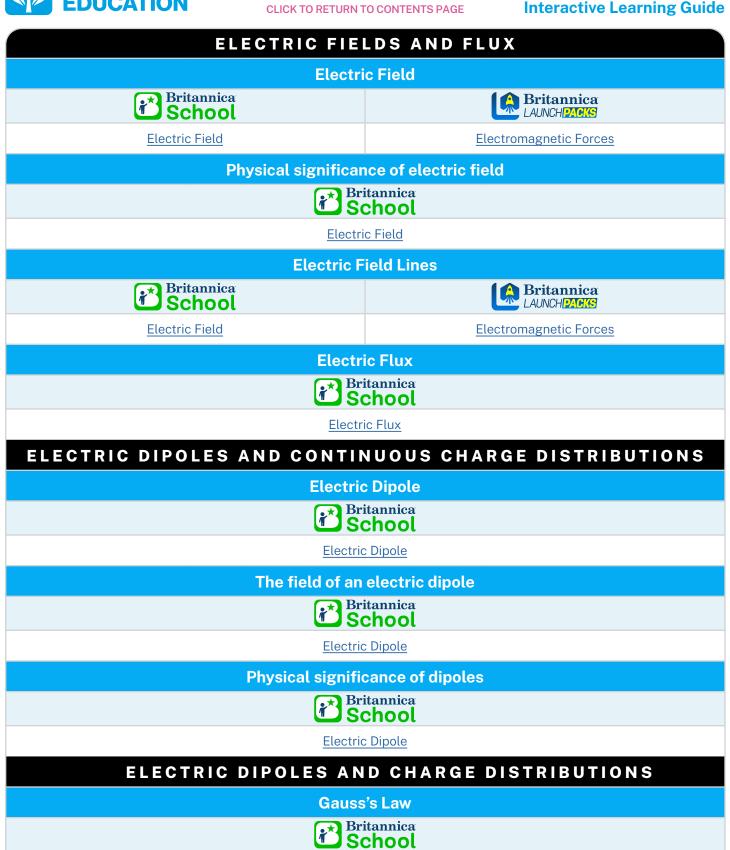




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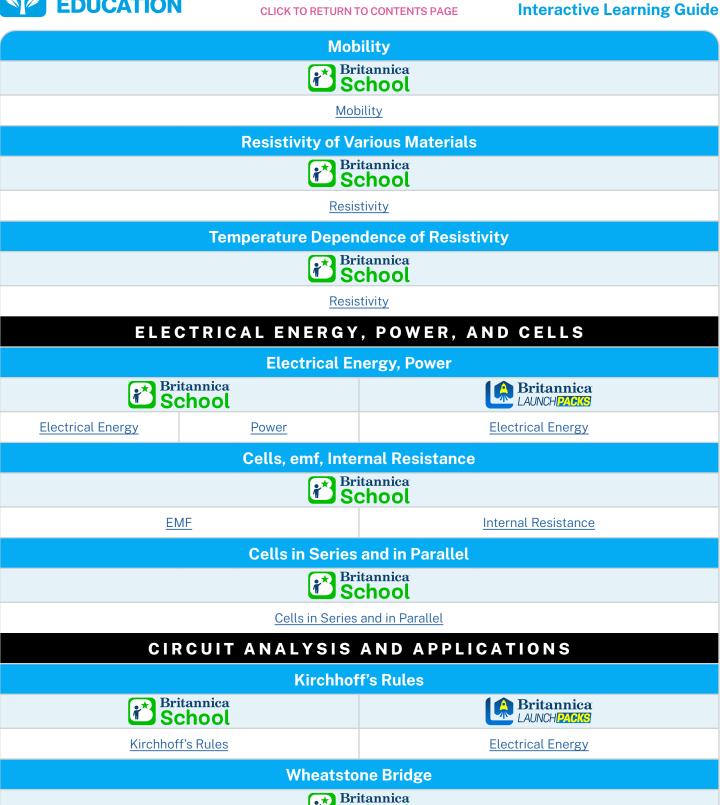


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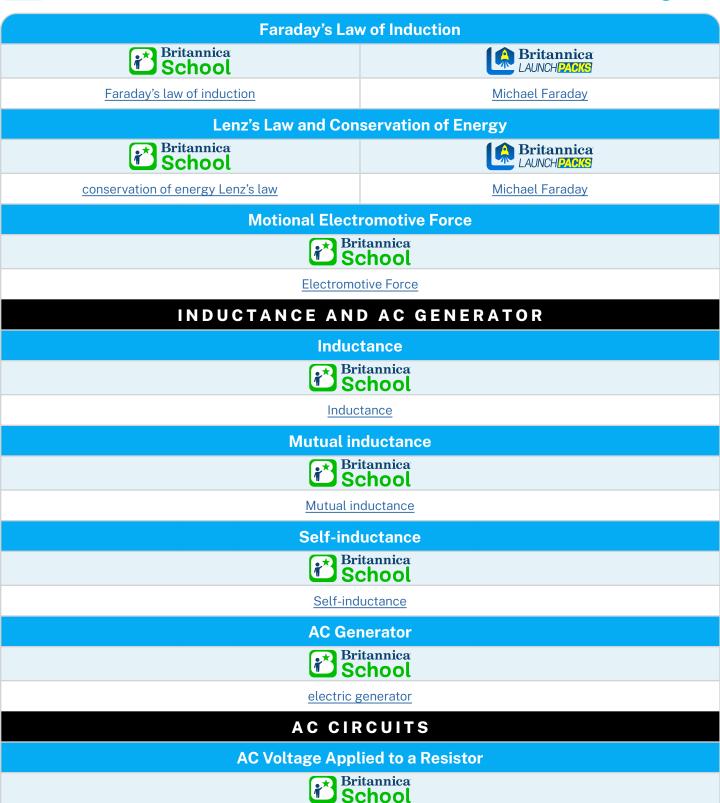
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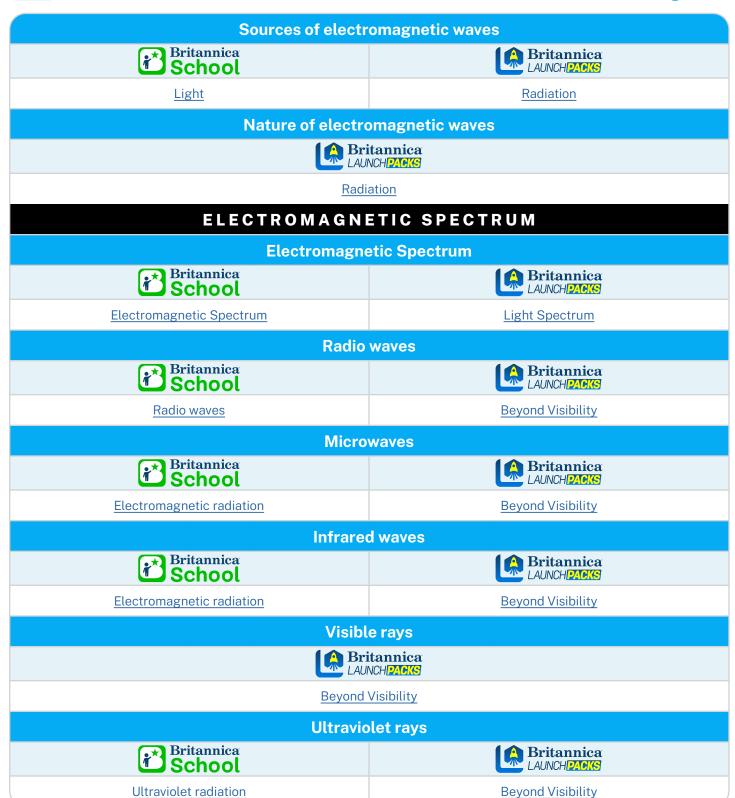
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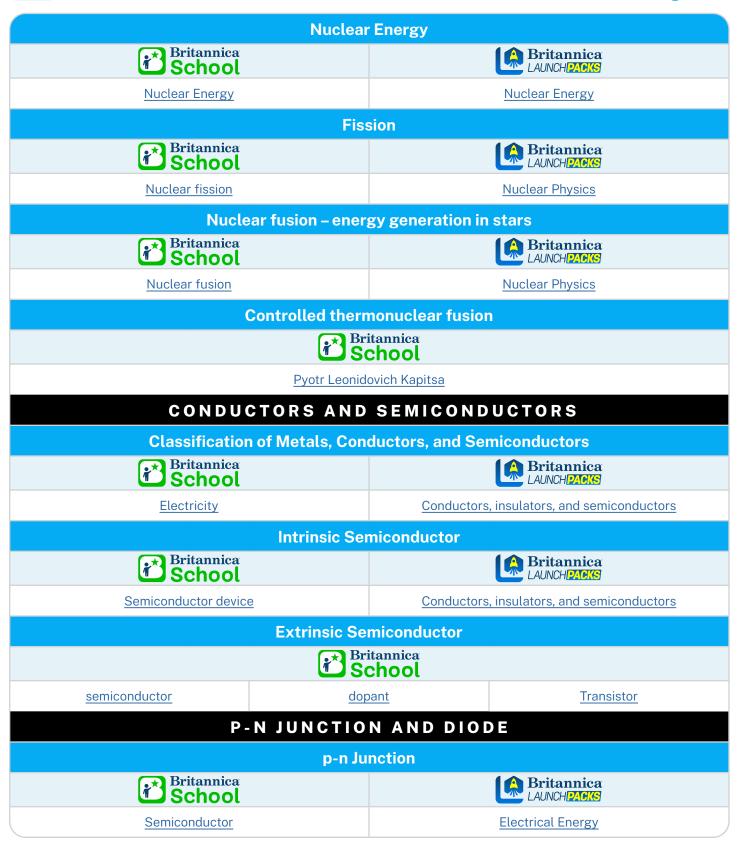
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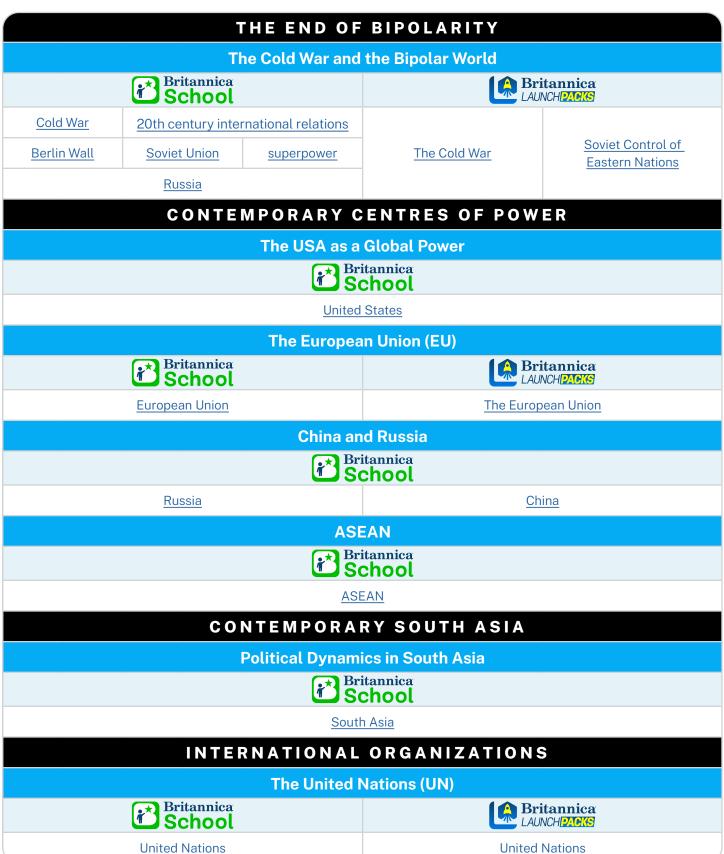
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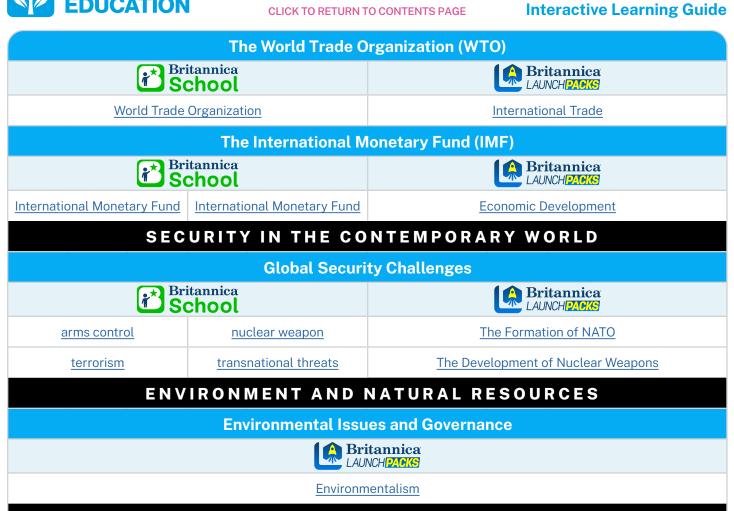
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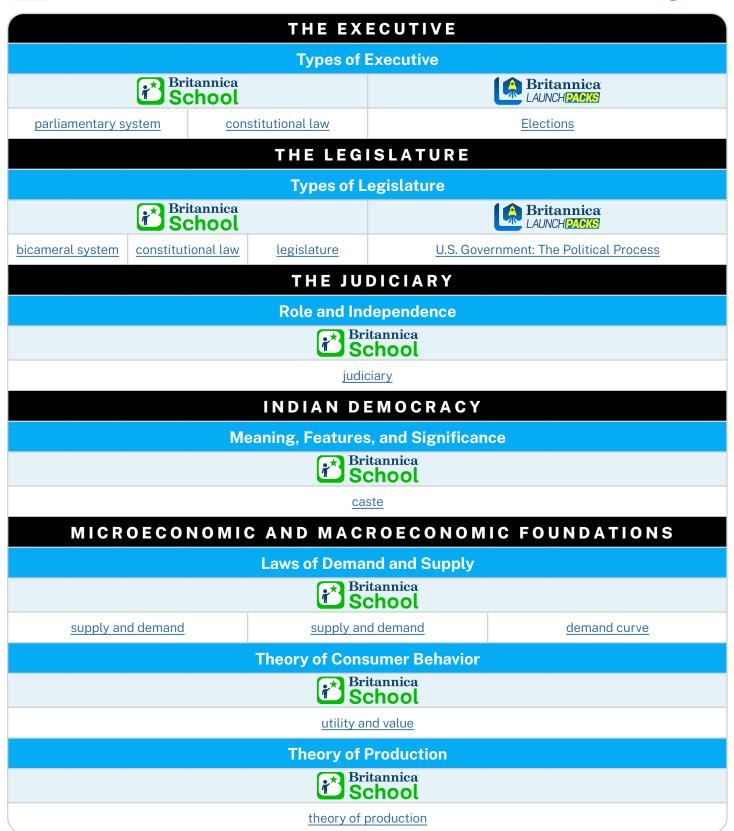
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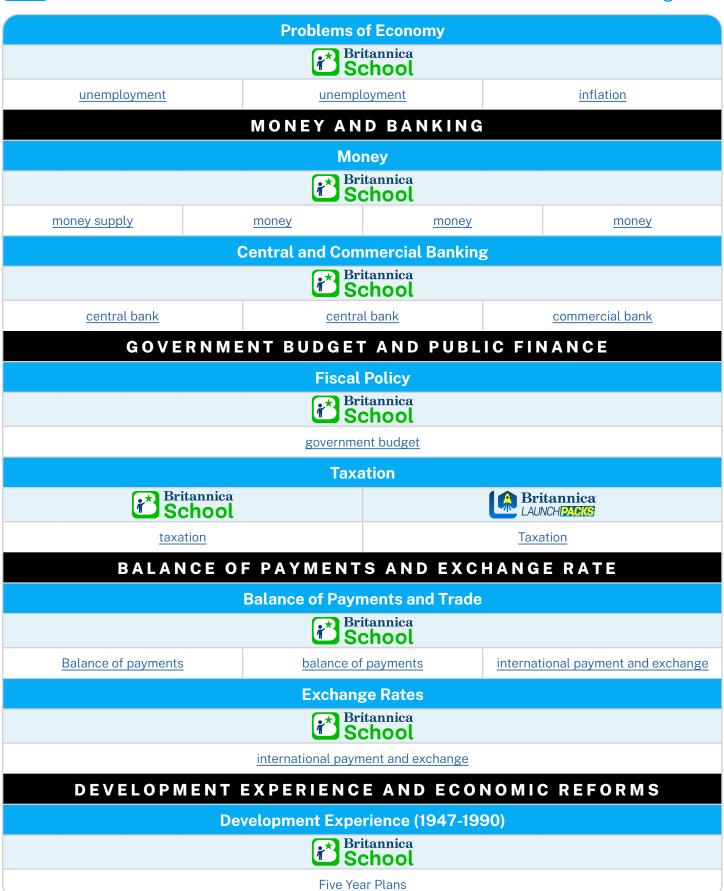
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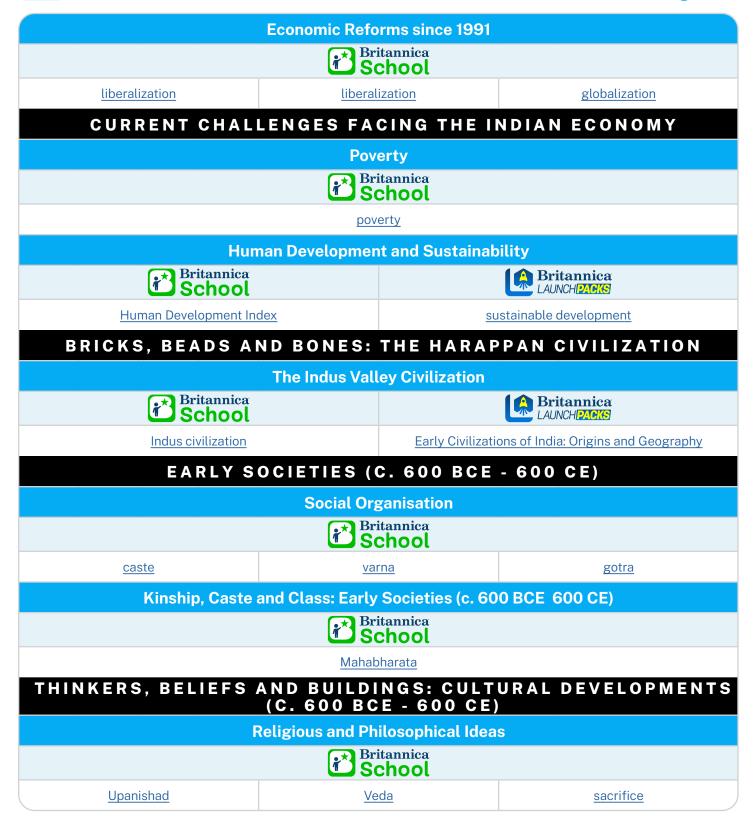


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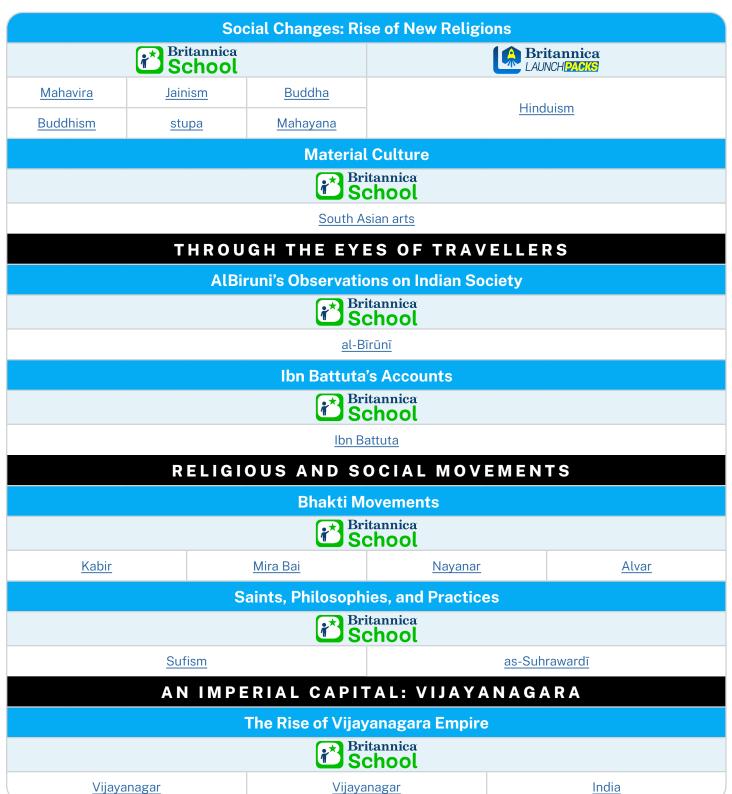


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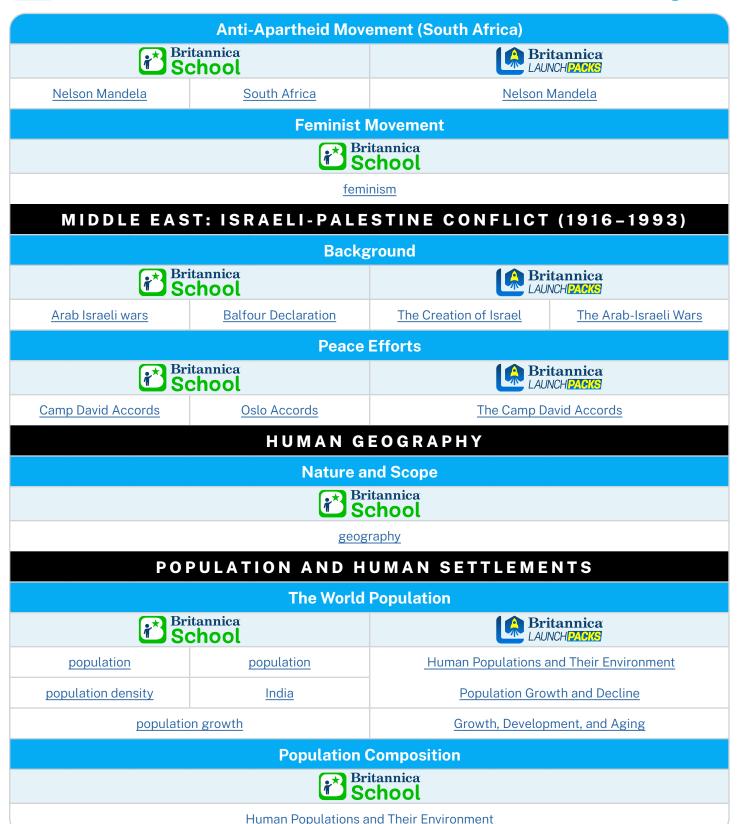
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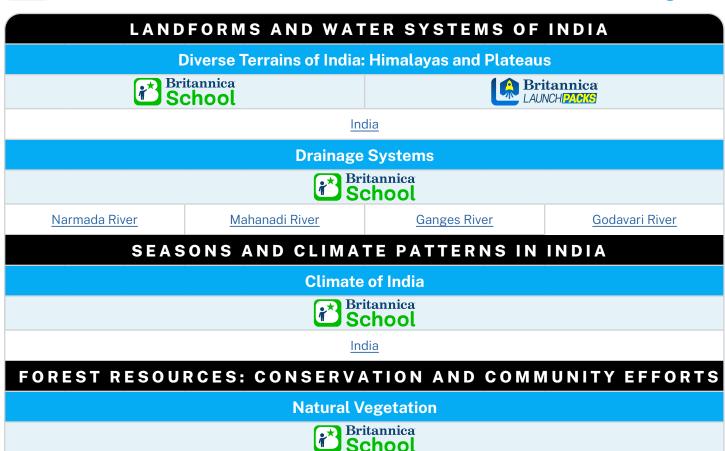
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