

INSECTS RULE
For 5th grade on up

GRADE 5 Core Standards

Standard 3: Life Science

Observe, describe and ask questions about how changes in one part of an ecosystem create changes in other parts of the ecosystem.

- 5.3.1 Observe and classify common Indiana organisms as producers, consumers, decomposers, predator and prey based on their relationships and interactions with organisms in their ecosystem.
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Standard 1: History

Students will describe the historical movements that influenced the development of the United States from pre-Columbian times up to 1800, with an emphasis on the American Revolution and the founding of the United States.

- 5.1.1 Identify and describe early cultures and settlements that existed in North America prior to contact with Europeans. (Individuals, Society and Culture).

Standard 2: Civics and Government

- 5.2.8 Describe group and individual actions that illustrate civic virtues, such as civility, cooperation, respect and responsible participation. (Individuals, Society and Culture).

- 5.2.9 Examine ways by which citizens may effectively voice opinions, monitor government, and bring about change in government including voting and participation in the election process.

- 5.2.10 Use a variety of information resources to identify and evaluate contemporary issues that involve civic responsibility, individual rights and the common good.
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Standard 3: Geography

Students will describe the Earth/sun relationship and use global grid systems. They will identify regions; describe physical and cultural characteristics; and locate states, capitals and major physical features or the United States. They will also explain the changing interaction of people with their environment in regions of the United States and show how the United States is related geographically to the rest of the world.

- 5.3.7 Identify major sources of accessible fresh water and describe the impact of access on the local and regional communities.
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Standard 4: Economics

Students will describe the productive resources and market relationships that influence the way people produce goods and services and earn a living in the United States in different historical periods.

- 5.4.2 Summarize a market economy and give examples of how the colonial and early American economy exhibited these characteristics.
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GRADE 6 Core

Standards

Standard 3: Life Science

Describe that all organisms, including humans, are part of complex systems found in all biomes (i.e. freshwater, marine, forest, desert, grassland and tundra).

- 6.3.1 Describe specific relationships (i.e. predator and prey, consumer and producer, and parasite and host) between organisms and determine whether these relationships are competitive or mutually beneficial.

- 6.3.2 Describe how changes caused by organisms in the habitat where they live can be beneficial or detrimental to themselves or to native plants and animals.

- 6.3.3 Describe how certain biotic and abiotic factors—such as predators, quantity of light and water, range of temperatures and soil composition—can limit the number of organisms an ecosystem can support.
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GRADE 6 Core Standards

Standard 1: History

Students will explore the key historic movements, events and figures that contributed to the development of modern Europe and America from early civilizations through modern times by examining religious institutions, trade and cultural interactions, political institutions, and technological developments

- 6.1.15 Describe the impact of industrialization and urbanization on the lives of individuals and on trade and cultural exchange between Europe and the Americas and the rest of the world. (Individuals, Society and Culture).
- 6.1.17 Compare the opportunities and dangers related to the development of a highly technological society.
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Standard 2: Civics and Government

Students will compare and contrast forms of government in different historical periods with contemporary political structures of Europe and the Americas and examine the rights and responsibilities of individuals in different political systems.

- 6.2.7 Define and compare citizenship and the citizen's role in selected countries of Europe and the Americas.
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Standard 3: Geography

Students will identify the characteristics of climate regions in Europe and the Americas and describe major physical features, countries and cities of Europe and the Western Hemisphere.

- 6.3.3 Describe and compare major physical characteristics of regions in Europe and the Americas.
- 6.3.8 Identify major biomes of Europe and the Americas and explain how these are influenced by climate.
- 6.3.12 Compare the distribution of natural gas, oil, forests, uranium, minerals, coal, seafood and water in countries such as Brazil, Mexico, Canada, Great Britain and Russia.
- 6.3.13 Explain the impact of humans on the physical environment in Europe and the Americas.
- 6.3.14 Explain and give examples of how nature has impacted the physical environment and human populations in specific areas of Europe and the Americas.
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Standard 4:

Economics

Students will examine the influence of physical and cultural factors upon the economic systems of countries in Europe and the Americas.

- 6.4.9 Identify situations in which the actions of consumers and producers in Europe or the Americas create helpful spillovers or harmful spillovers to people inside a country who are not directly involved in the consumption or production of a product.
- 6.4.10 Explain how saving and investing help increase productivity and economic growth and compare and contrast individual saving and investing options.
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Standard 3: Life Science

Describe that all organisms, including humans, are part of complex systems found in all biomes (i.e., freshwater, marine, forest, desert, grassland and tundra)

Understand that the major source of energy for ecosystems is light produced by major nuclear reactions in the sun.

- 6.3.4 Recognize that plants use energy from the sun to make sugar (i.e. glucose) by the process of photosynthesis.
- 6.3.5 Describe how all animals, including humans, meet their energy needs by consuming

other organisms, breaking down their structures, and using the materials to grow and function.

- 6.3.6 Recognize that food provides the energy for the work that cells do and is a source of molecular building blocks that can be incorporated into a cell's structure or stored for later use.

GRADE 7 Core Standards

Standard 1: History

Students will examine the major movements, events and figures that contributed to the development of nations in modern Africa, Asia and the Southwest Pacific from ancient civilizations to modern times by examining religious institutions, trade and cultural interactions, political institutions, and technological developments.

- 7.1.17 Describe the impact of industrialization, urbanization and globalization in post-colonial South Africa, India, China and Kenya. (Individuals, Society and Culture).
- 7.1.18 Identify and describe recent conflicts and political issues between nations or cultural groups. (Individuals, Society and Culture).
- 7.1.19 Create and compare timelines that identify major people and events and developments in the history of civilization and/or countries of Africa, Asia and the Southwest Pacific.
- 7.1.21 Analyze and effect relationship, bearing in mind multiple causation in the role of individuals, beliefs and chance in history.
- 7.1.22 Distinguish between unsupported expressions of opinion and informed hypotheses grounded in historical evidence.

Standard 2: Civics and Government

Students will trace the development of different forms of government in different historical eras and compare various contemporary political structures in Africa, Asia and the Southwest Pacific in terms of power, approach to human rights and the roles of citizens.

- 7.2.5 Define and compare citizenship and the citizen's role in selected countries of Africa, Asia and the Southwest Pacific.

Standard 3: Geography

Students will explain how atmospheric and oceanic systems affect the seasons and climate. They will understand and use technology and grid systems to identify and locate places geographically. They will identify and categorize the major geographic characteristics and regions of Africa, Asia and the Southwest Pacific. They will also name and locate major physical features, countries and major cities, and use geographic skills and technology to examine geographic relationships within and between these regions and the rest of the world.

- 7.3.4 Identify and describe major physical characteristics of regions in Africa, Asia and the Southwest Pacific.
- 7.3.8 Describe ecosystems of Africa's deserts, Asia's mountain regions, and the coral reefs of Australia.
- 7.3.9 Compare and contrast the distribution of natural resources in Africa, Asia and the Southwest Pacific.
- 7.3.10 Describe the limitations that climate and land forms place on land or people in regions of Africa, Asia and the Southwest Pacific.
- 7.3.14 Use a variety of information resources to identify current issues and developments related to the environment in selected countries in Africa, Asia and the Southwest Pacific.

Standard 4:

Economics

Students will examine the influence of physical and cultural factors upon the economic systems found in countries of Africa, Asia and the Southwest Pacific.

- 7.4.2 Identify economic connections between the local community and the countries of Africa, Asia or the Southwest Pacific.
- 7.4.6 Compare and contrast the standard of living of various countries in Africa, Asia and the Southwest Pacific using Gross Domestic Product (GDP) per capita as an

indicator.

- 7.4.7 Describe ways that people can increase individual human capital.
- 7.4.8 Identify ways that societies deal with helpful spillovers (e.g. education) or harmful spillovers (e.g. pollution).

GRADE 8 Core Standards

Standard 2: Civics and Government

Students will explain the major principles, values and institutions of constitutional government and citizenship, which are based on the founding documents of the United States and how three branches of government share and check power within our federal system of government.

- 8.2.2 Identify and explain the relationship between rights and responsibilities of citizenship in the United States.
- 8.2.7 Explain the importance in a democratic republic of responsible participation by citizens in voluntary civil associations/non-governmental organizations that comprise civil society.
- 8.2.9 Explain how citizens can monitor and influence the development and implementation of public policies at local, state and national levels of government.

Standard 3: Geography

Students will identify the major geographic characteristics of the United States and its regions. They will name and locate the major physical features of the United States, as well as each of the states, capitals and major cities, and will use geographic skills and technology to examine the influence of geographic factors on national development.

- 8.3.4 Name and describe processes that build up the land and processes that erode it and identify places these occur.
- 8.3.11 Identify ways people modified the physical environment as the United States developed and describe the impacts that resulted.

Standard 4: Economics

Students will identify, describe and evaluate the influence of economic factors on national development from the founding of the nation to the end of Reconstruction.

- 8.4.3 Evaluate how the characteristics of a market economy have affected the economic and labor development of the United States.
- 8.4.6 Relate technological change and inventions to changes in labor productivity in the United States in the eighteenth and nineteenth centuries.
- 8.4.9 Explain and evaluate examples of domestic and international interdependence throughout United States history.
- 8.4.11 Use a variety of information resources to compare and contrast job skills needed in different time periods in United States history.

GRADES 8-12 Core

Standards

BIOLOGY Standard 3: Matter Cycles and Energy Transfer

Describe how the sun's energy is captured and used to construct sugar molecules that can be used as a form of energy or serve as building blocks of organic molecules.

Diagram how matter and energy cycle through an ecosystem.

- B.3.1 Describe how some organisms capture the sun's energy through the process of photosynthesis by converting carbon dioxide and water into high-energy compounds and releasing oxygen.
- B.3.2 Describe how most organisms can combine and recombine the elements contained in sugar molecules into a variety of biologically essential compounds by utilizing

the energy from cellular respiration.

- B.3.3 Recognize and describe that metabolism consists of all of the biochemical reactions that occur inside cells, which include the production, modification, transport, and exchange of materials that are required for the maintenance of life.
- B.3.4 Describe how matter cycles through an ecosystem by way of food chains and food webs and how organisms convert that matter into a variety of organic molecules to be used in part in their own cellular structures.
- B.3.5 Describe how energy from the sun flows through an ecosystem by way of food chains and food webs and how only a small portion of that energy is used by individual organisms while the majority is lost as heat.

MIDDLE SCHOOL FACS

Standard 1 Life & Careers

Integrate multiple life roles and responsibilities in school, family, career, and community settings.

Standard 4: Interdependence

Describe the relationship between living and nonliving components of ecosystems and describe how that relationship is in flux due to natural changes and human actions.

- B.4.1 Explain that the amount of life environments can support is limited by the available energy, water, oxygen and minerals and by the ability of ecosystems to recycle the remains of dead organisms.
- B.4.2 Describe how human activities and natural phenomena can change the flow and of matter and energy in an ecosystem and how those changes impact other species.
- B.4.4 Describe how climate, the pattern of matter and energy flow, the birth and death of new organisms, and the interaction between those organisms contribute to the long-term stability of an ecosystem.

Standard 8: Evolution

Describe how modern evolutionary theory provides an explanation of the history of life on earth and the similarities among organism that exist today.

- B.8.5 Describe how organisms with beneficial traits are more likely to survive, reproduce, and pass on their genetic information due to genetic variations, environmental forces and reproductive pressures.

GRADE 9-12 Core Standards

Standard 1: Economics

Students will understand that productive resources are limited; therefore, people, institutions and governments cannot have all the goods and services they want. As a result, people, institutions and governments must choose some things and give up others.

- E.1.1 Define each of the productive resources (natural, human, capital) and explain why they are necessary for the production of goods and services. (Geography)
- E.1.2 Explain how consumers and producers confront the condition of scarcity by making choices which involve opportunity costs and tradeoffs.
- E.1.3 Explain the important role of the entrepreneur in taking the risk to combine productive resources to produce goods and services.
- E. 1.4 Describe how people respond predictably to positive and negative incentives.
- E. 1.5 Explain that voluntary exchange occurs when all participating parties expect to gain.
- E.1.6 Compare and contrast how the various economic systems (traditional, market, command, mixed) answer the questions: What to produce? How to produce it? For whom to produce?
- E.1.9 Diagram and explain a Circular Flow Model of a market economy, showing households and businesses as decision makers, resource and money flows, and the three basic markets—product, productive resources and financial markets.

Standard 2: Supply and Demand

Students will understand the role that supply and demand, prices, and profits play in determining production and distribution in a market economy.

- E.2.1 Define supply and demand.
- E.2.2 Identify factors that cause changes in market supply and demand.
- E.2.3 Describe the role of buyers and sellers in determining the equilibrium price.
- E.2.4 Describe how prices send signals to buyers and sellers.
- E.2.5 Recognize that consumers ultimately determine what is produced in a market economy (consumer sovereignty).
- E.2.6 Demonstrate how supply and demand determine equilibrium price and quantity in the product, resource, and financial markets.
- E.2.11 Illustrate how investment in factories; machinery; new technology; and the health, education and training of people increases productivity and raises future standards of living. (Individuals, Society and Culture).

Standard 5: National Economic Performance

Students will understand the means by which economic performance is measured.

- E.5.9 Recognize that a country's overall level of income, employment and prices are determined by the individual spending and production decisions of households, firms and government. (Government; Individuals, Society and Culture).
- E.5.11 Compare and contrast solutions for reducing unemployment. (Government).

Earth and Space Science I

Standard 3: The Earth

Recognize and describe that earth sciences address planet wide interacting systems (e.g. the oceans, the air, solid ground, and life on Earth) and interactions with the solar system.

Examine the interrelationships between society and the planet wide interacting systems and understand the basic physical and chemical laws that control these interactions.

ES 3.1 Understand that the Earth system contains fixed amounts of each stable chemical element and that each element moves among reservoirs in the solid earth, oceans, atmosphere and living organisms as part of biogeochemical cycles (i.e. nitrogen, water, carbon, oxygen and phosphorus cycles), which are driven by energy from within the earth and from the sun.

ES 3.2 Demonstrate the possible effects of atmospheric changes brought about by natural and human made processes.

ES 3.3 Identify and differentiate between renewable and nonrenewable resources present within Earth's systems. Describe the possible long-term consequences that increased human consumption has placed on natural processes that renew some resources.

ES 3.4 Recognize that fundamental physical and chemical laws control past, present and future dynamic interactions between and within Earth systems.

Standard 4: The Atmosphere and Hydrosphere

Understand the structure and circulation of Earth's atmosphere and hydrosphere and explain how natural and human factors may interact with these processes.

Understand that both weather and climate involve the transfer of matter and energy throughout the atmosphere and hydrosphere, driven by solar energy and gravity.

ES 4.1 Examine the origins, structure, composition, and function of Earth's atmosphere. Include the role of living organisms in the production and cycling of atmospheric gases.

ES 4.2 Describe the relationships among evaporation, precipitation, ground water, surface water, and glacial systems in the water cycle. Discuss the effect of human interactions with the water cycle.

ES 4.3 Explain the importance of heat transfer between and within the atmosphere, land masses, and bodies of water.

Biology

Standard 3: Matter Cycles and Energy Transfer

Describe how the sun's energy is captured and used to construct sugar molecules that can be used as a form of energy or serve as building blocks of organic molecules.

Diagram how matter and energy cycle through an ecosystem.

- B.3.1 Describe how some organisms capture the sun's energy through the process of photosynthesis by converting carbon dioxide and water into high-energy compounds and releasing oxygen.
 - B.3.2 Describe how most organisms can combine and recombine the elements contained in sugar molecules into a variety of biologically essential compounds by utilizing the energy from cellular respiration.
 - B.3.3 Recognize and describe that metabolism consists of all of the biochemical reactions that occur inside cells, which include the production, modification, transport, and exchange of materials that are required for the maintenance of life.
 - B.3.4 Describe how matter cycles through an ecosystem by way of food chains and food webs and how organisms convert that matter into a variety of organic molecules to be used in part in their own cellular structures.
 - B.3.5 Describe how energy from the sun flows through an ecosystem by way of food chains and food webs and how only a small portion of that energy is used by individual organisms while the majority is lost as heat.
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Standard 4: Interdependence

Describe the relationship between living and nonliving components of ecosystems and describe how that relationship is in flux due to natural changes and human actions.

- B.4.1 Explain that the amount of life environments can support is limited by the available energy, water, oxygen and minerals and by the ability of ecosystems to recycle the remains of dead organisms.
 - B.4.2 Describe how human activities and natural phenomena can change the flow and of matter and energy in an ecosystem and how those changes impact other species.
 - B.4.3 Describe the consequences of introducing non-native species into an ecosystem and identify the impact it may have on that ecosystem.
 - B.4.4 Describe how climate, the pattern of matter and energy flow, the birth and death of new organisms, and the interaction between those organisms contribute to the long-term stability of an ecosystem.
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Standard 8:

Evolution

Describe how organisms with beneficial traits are more likely to survive, reproduce, and pass on their genetic information due to genetic variations, environmental forces and reproductive pressures.

Integrated Chemistry and Physics Standard 8: Society (Energy production, environment, economics)

Understand the impact of energy production and use on society and the environment.

- ICP8.4 Describe how efficient use of renewable and non-renewable energy sources is essential to maintaining an acceptable environment.
- ICP8.5 Describe how the availability of energy resources is essential to the development of an economically viable society.
- ICP 8.6 Contrast the dependence on and use of energy and other natural resources in the economies of industrial nations, of developing nations and of undeveloped nations.

