INDIANA DEPARTMENT of EDUCATION

2024 INDIANA CONTENT CONNECTORS

SCIENCE

GRADE 5

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Indiana Content Connectors Context and Purpose

Introduction

The Indiana Content Connectors for Grade 5 Science are the result of a process designed to identify, evaluate, synthesize, and create high-quality learning expectations for Indiana students with significant cognitive disabilities.

The Indiana Department of Education (IDOE) convened stakeholder committees to review proposed revisions to Indiana's Alternative Standards, known as content connectors. The content connectors are designed to measure the knowledge and skills of students with the most significant cognitive disabilities and are assessed with the state's alternate assessment. The content connectors are designed to ensure that all Indiana students in this population are prepared with essential knowledge and skills needed to access employment, enrollment, or enlistment leading to service.

What are the Content Connectors and how should they be used?

The Indiana Content Connectors are designed to help educators, parents, students, and community members understand the necessary content for each grade level, and within each content area domain, to access employment, enrollment, or enlistment leading to service. These content connectors should form the basis for strong core instruction for all students at each grade level and content area. The content connectors identify the minimum academic content or skills to which Indiana students need access in order to be prepared for success after graduation, but they are not an exhaustive list.

While the Indiana Content Connectors establish key expectations for knowledge and skills and should be used as the basis for curriculum, the content connectors by themselves do not constitute a curriculum. It is the responsibility of the local school corporation to select and formally adopt curricular tools, including textbooks and any other supplementary materials, that align with Indiana Content Connectors. Additionally, corporation and school leaders should consider the appropriate instructional sequence of the content connectors as well as the length of time needed to teach each one. Every content connector has a unique place in the continuum of learning, but each content connector will not require the same amount of time and attention. A deep understanding of the vertical articulation of the standards will enable educators to make the best instructional decisions. These content connectors must also be complemented by robust, evidence-based instructional practices to support overall student development. By utilizing strategic and intentional instructional practices, other areas such as STEM and employability skills can be integrated with the content connectors.

Acknowledgments

IDOE appreciates the time, dedication, and expertise offered by Indiana's K-12 general and special educators, higher education professors, representatives from business and industry, families, and other stakeholders who contributed to the development of the Indiana Content Connectors. We wish to specially acknowledge the committee members, as well as participants in the public comment period, who dedicated many hours to the review and evaluation of these content connectors designed to prepare Indiana students for success after graduation.

Grade 5 Science

Standards and content connectors identified as essential for mastery by the end of the grade level are indicated with gray shading and an "E."

Indiana Academic Standards	Content Connectors
Matter and Its Interactions	
5-PS1-1: Matter and Its Interactions Students who demonstrate understanding can: Develop a model to describe that matter is made of particles too small to be seen. [Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] (E)	**5-PS1-1a:** Use a model (e.g. diagram, picture) to describe that matter is made of particles too small to be seen. [Clarification Statement: Examples could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] (E)
5-PS1-2: Matter and Its Interactions Students who demonstrate understanding can: Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. [Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.]	**5-PS1-2a:** Measure quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
5-PS1-3: Matter and Its Interactions Students who demonstrate understanding can: Make observations and measurements to identify materials based on their properties. [Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] (E)	**5-PS1-3a:** Make observations and measurements of physical properties (e.g., color, hardness, magnetic forces) to classify materials. [Clarification Statement: Examples of materials to be classified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] (E)

5-PS1-4: Matter and Its Interactions Students who demonstrate understanding can: Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	**5-PS1-4a:** Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
Motion and Stability: Forces and Interaction	
5-PS2-1: Motion and Stability: Forces and Interaction Students who demonstrate understanding can: Support an argument that the gravitational force exerted by Earth on objects is directed down. [Clarification Statement: “Down” is a local description of the direction that points toward the center of the spherical Earth.]	**5-PS2-1a:** Support the argument that Earth’s gravity pulls objects towards its surface.
Energy	
5-PS3-1: Energy Students who demonstrate understanding can: Use models to describe that energy in animals’ food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [Clarification Statement: Examples of models could include diagrams, and flow charts.]	**5-PS3-1a:** Use models to describe that the sun gives energy to plants, which becomes food for animals. **5-PS3-1b:** Use models to describe that food gives animals the energy they need for life processes (e.g., growth, body warmth, motion). (E)
From Molecules to Organisms: Structures and Processes	
5-LS1-1: From Molecules to Organisms: Structures and Processes Students who demonstrate understanding can: Support an argument that plants get the materials they need for growth chiefly from air and water. [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]	**5-LS1-1a:** Determine the evidence needed to support the claim that plants receive most of what they need to grow from air and water.

Ecosystems: Interactions, Energy, and Dynamics	
5-LS2-1: Ecosystems: Interactions, Energy, and Dynamics Students who demonstrate understanding can: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] (E)	**5-LS2-1a:** Use a model to describe the movement of matter among plants, animals, decomposers, and the environment. (E)
Earth's Place in the Universe	
5-ESS1-1: Earth's Place in the Universe Students who demonstrate understanding can: Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.	**5-ESS1-1a:** Use data to compare the apparent brightness of stars based on their relative distances from Earth.
5-ESS1-2: Earth's Place in the Universe Students who demonstrate understanding can: Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. [Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] (E)	**5-ESS1-2a:** Use data from graphical displays to reveal patterns in the length and direction of shadows throughout the day, daily patterns of day and night, and the seasonal appearance of stars. [Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] (E)
Earth's Systems	
5-ESS2-1: Earth's Systems Students who demonstrate understanding can: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. [Clarification Statement: Examples could include the influence of the ocean on	**5-ESS2-1a:** Use a model to describe how Earth's major systems (the geosphere, the hydrosphere, the atmosphere, and the biosphere) interact.

ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.]	
5-ESS2-2: Earth's Systems Students who demonstrate understanding can: Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	**5-ESS2-2a:** Use evidence from graphs to support the claim that most of Earth's water is in the oceans as salt water, and most of the fresh water is in glaciers or underground.
Earth and Human Activity	
E5-ESS3-1: Earth and Human Activity Students who demonstrate understanding can: Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment. (E)	**5-ESS3-1a:** Use information to determine actions people can take to lessen the impact of human activities on Earth's resources and environments. (E)
Engineering Design	
3-5-ETS1-1: Engineering Design Students who demonstrate understanding can: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	**3-5-ETS1-1a:** Identify a solution to a problem based on a specific set of desired features (criteria) and available materials and resources (constraints).
3-5-ETS1-2: Engineering Design Students who demonstrate understanding can: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	**3-5-ETS1-2a:** Generate and compare multiple solutions to a problem by investigating how well each solution works under certain conditions. **3-5-ETS1-2b:** Identify a design improvement to a problem by sharing ideas with peers.

3-5-ETS1-3: Engineering Design Students who demonstrate understanding can: Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	**3-5-ETS1-3a:** Test design solutions to identify aspects of the design that can be modified or improved based on specific limitations.