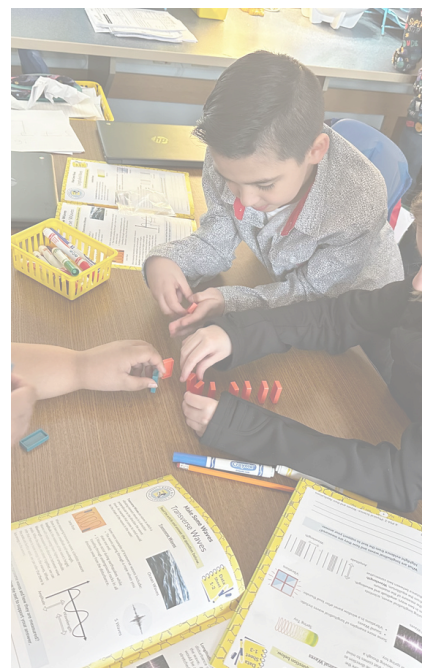




Curriculum Mapping





Welcome to our guide on the K-6th National science standards. This brochure has been created to highlight the curriculum map and vertical alignment essential for fostering a robust science education for our students.

Understanding the Challenge

The Indiana Department of Education (IDOE) has recently condensed the national science standards to approximately 30% of their original scope, labeling them as "**essential standards**" (ES). While this streamlining aims to focus learning, it inadvertently *creates a substantial gap in the foundational knowledge and skills necessary for our students to excel in STEM* (Science, Technology, Engineering, and Mathematics) *careers*.

The Impact on Our Students

This reduction means Indiana students are at a **significant** disadvantage compared to their peers in other states, lacking the critical thinking and problem-solving skills that are nurtured through a comprehensive science education. *Science is not just a subject; it's a discipline that fosters inquiry, logic, and the systematic exploration of the world around us.*

Inside This Brochure

- **Curriculum Map:** Outlines the ideal learning trajectory at each grade level according to the National Science standards.
- **Vertical Alignment:** Features a visual "ladder" of student success and learning illustrating the enormous gap created by the reduction of standards, emphasizing what our students are missing.
- **GLC Insights:** We show how the Grade Level Certified (GLC) curriculum effectively manages students' cognitive load and significantly impacts their academic success.

Our Commitment

At ETHOS, we believe in a **TEACHER DRIVEN- STUDENT FOCUSED** approach to education. We are dedicated to supporting educators in delivering the highest quality science education, ensuring that all students are well-prepared for the future's challenges and opportunities.

We hope this brochure serves as a valuable resource in understanding the importance of a comprehensive science curriculum and advocating for the educational needs of all students.

THANK YOU for your dedication to excellence in education.

By working TOGETHER, THE BEST IS YET TO COME!

The ETHOS GLC TEAM

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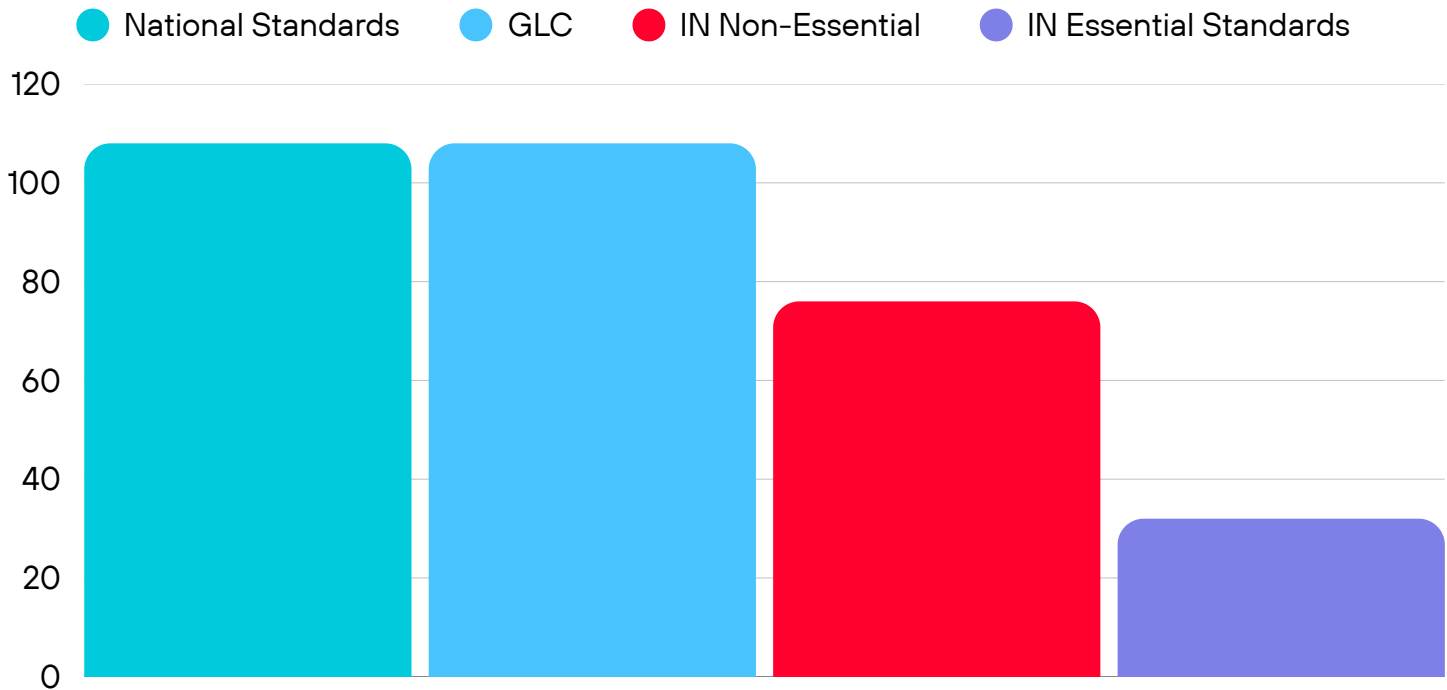
GLC Units

PreK	Kdg	1st	2nd
Exploring Our Five Senses	Magic Motion	Sound and Light	Exploring Matter
Investigating Textures	Bumper Cars	Rubber Band Guitar	Physical Properties of Matter
Sightseeing Quest	Ramping Up	Peepbox	Absorption: Paper Towel Test
Smell & Taste Wonderland	Apply Force	Can You See Through Me?	Objects & Pieces
"Ear" resistible Explorations		Paper Cup Phone	Reversible & Irreversible Changes
Sun, Seasons & Weather	Weather Watchers	Nature's Lessons	Investigating Plants & Habitats
Sunshine & Moonlight	Soaking Up the Sun	Biomimicry	Seed to Feed
Weather	Safety First!	Parents Help Offspring	Seeds on the Move
Seasons	What's the Weather	Are You My Family?	Earth's Habitat
Growing Together	Our Living World	Sun, Moon & Stars	The Changing Earth
Living Wonders	Survival Skills	Following the Moon	Modeling Landforms
Learn, Grow, Bloom	I Need You	Twinkle Twinkle Little Constellation	Oceans, Lakes & Rivers
Nurturing Needs	Better Together	Following the Sun	Earth Changes
		Catch a Fallen Star	Preventing Beach Erosion
Exploring Motion			
Push Pull			
Rolling Along			
Explore and Create			
3rd	4th	5th	6th
Forces	Energy Explorers	Mysteries of Matter	Waves Around Us
Balanced & Unbalanced Forces	Fast & Slow Bowling	Particles of Matter	Modeling Waves
Predicting Motion	Static Electricity	Conserving the weight of Matter	Exploring Sound Waves
Magnetic Fields	When Objects Collide	Observing Properties of Matter	Exploring Light Waves
Magnet Fishing	Electrical Energy	Mixing Up Matter	Digital vs Analog
		Movement of Matter	
Nature's Influence	A World of Waves	Nature's Balance	Earth's Sky
Life Cycles	Make Some Waves	Plant Survival	Sun, Earth, Moon
Inherited Traits	Creative Reflections	Food Chains	Lunar Phases
Influenced by the Environment	Sending Coded Messages	Food Webs	Eclipses
Surviving the Wild		*Ecosystem Diorama	Seasons
Surviving in a Changing World	Nature's Architects	Innerconnected Earth	Our Solar System
Getting Help From Others	Unique Structures	Why So Bright?	Inner Solar System
Fossils: Clues to the Past	Whose Feet?	Seasonal Sky Changes	Outer Solar System
What Do I Need to Survive	Using Senses to Survive	Water, Water Everywhere	Gravity
Changing Environments		Interconnected Earth	Solar System Scale Model
		Protecting Our Resources	
Wind, Weather & Water	The Earth Beneath Our Feet	The Power of Simple Machines	Exploring Ecosystems
Wind Direction	Rock Layers: Changes Over Time	Amazing Adventures with Wedges & Levers	Energy Flow
Weather & Climate	Earth Changes-Erosion & Weathering	Inclined Planes & Screws in Action	Interactions in Ecosystems
Water Cycle in a Bag	Plate Tectonics and Earth's Features	Wheels in Motion: Wheel & Axle and Pulley	Ecosystem Populations
Nature's Fury	Using Natural Resources	Rube Goldberg: Using Simple Machines	Environmental Solutions
	Earthquake Resistant		



Comparison Chart

GRADE LEVEL CERTIFIED (GLC) VS. INDIANA DEPARTMENT OF EDUCATION (IDOE) "ESSENTIAL STANDARDS"



- Indiana (IDOE) considers only 32 standards in K-6 as ESSENTIAL Standards for students.
- Indiana (IDOE) Essential standards only meet 30% of the national science standards.

**“GLC IS WHAT TEACHERS NEED TO
SUCCESSFULLY IMPLEMENT THE NATIONAL
SCIENCE STANDARDS WITHIN AN ALREADY
JAM-PACKED SCHOOL DAY!”**

- GLC Teacher



Kindergarten

GLC - UNITS, LABS, STANDARDS, ESSENTIAL STANDARDS

● IN Non-Essential

● IN Essential



- GLC Kindergarten aligns with ALL 14 National Standards.
- Indiana identified 4 as Essential Standards. **ES**

***Please Note:** In addition to the standards below, Engineering Design standards K-2-ETS1-1, ETS1-2, ETS1-3 are integrated into GLC Lab Lessons. See Engineering Design Vertical Alignment page 28.

GLC - Magic Motion Unit

GLC - Lab Lesson	Standard	Standard Definition
Bumper Cars	K- PS2-1	Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
Ramping Up	K-PS2-2	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.
Applied Force	K-PS2-2	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

ES

GLC - Weather Watchers Unit

Soaking up the Sun	K-PS3-1	Make observations to determine the effect of sunlight on Earth's surface.
Safety First	K-PS3-2	Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on an area.
What's the Weather?	K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
	K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.

ES

ES

GLC - Our Living World Unit

ES

Survival Skills	K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
I Need You	K-ESS2-2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
	K-ESS3-1	Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
Better Together	K-ESS3-3	Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

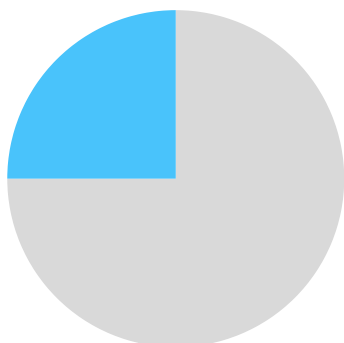


FIRST GRADE

GLC - UNITS, LABS, STANDARDS, ESSENTIAL STANDARDS

● IN Non-Essential

● IN Essential



- GLC First Grade aligns with **ALL 12 National Standards**.
- Indiana identified 3 as Essential Standards. **ES**

***Please Note:** In addition to the standards below, Engineering Design standards K-2-ETS1-1, ETS1-2, ETS1-3 are integrated into GLC Lab Lessons. See Engineering Design Vertical Alignment page 28.

GLC - Sound and Light Unit

GLC - Lab Lesson	Standard		Standard Definition
Rubber Band Guitar	1-PS4-1	ES	Vibrating materials make sound and sound makes materials vibrate
Peepbox	1-PS4-2		You need light to see.
Can You See Through Me?	1-PS4-3		Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light
Paper Cup Phone	1-PS4-4		Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance

GLC - Nature's Lessons Unit

Biomimicry	1-LS1-1	ES	Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow and meet their needs.
Parents Help Offspring	1-LS1-2		Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
Are You My Family?	1-LS3-1		Make observations to construct an evidence based account that young plants and animals are like, but not exactly like, their parents.

GLC - Sun, Moon & Stars Unit

Patterns in the Sky	1-ESS1-1		Use observation of the sun, moon and stars to describe patterns that can be predicted.
Twinkle Twinkle Little Constellation			Use observation of the sun, moon and stars to describe patterns that can be predicted.
Following the Sun	1-ESS1-2	ES	Make observations at different times of the year to relate the amount of daylight to the time of year.
Catch a Fallen Star	K-2-ETS1-2		Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

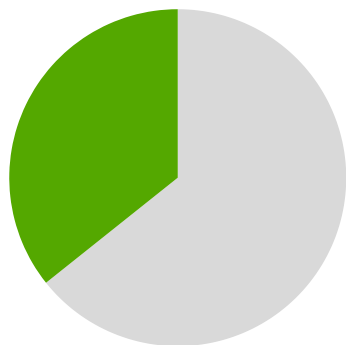


IN Non-Essential

IN Essential

SECOND GRADE

GLC - UNITS, LABS, STANDARDS, ESSENTIAL STANDARDS



- GLC Second Grade aligns with ALL 14 National Standards.
- Indiana identified 5 as Essential Standards. **ES**

***Please Note:** In addition to the standards below, Engineering Design standards K-2-ETS1-1, ETS1-2, ETS1-3 are integrated into GLC Lab Lessons. See Engineering Design Vertical Alignment page 28.

GLC - Exploring Matter Unit

GLC - Lab Lesson	Standard	Standard Definition
Physical Properties of Matter	2-PS1-1 ES	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
Absorption: Paper Towel Test	2-PS1-2 ES	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
Objects & Pieces	2-PS1-3	Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
Reversible & Irreversible Changes	2-PS1-4	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

GLC - Investigating Plants & Habitats Unit

Seed to Feed	2-LS2-1 ES	Plan and conduct an investigation to determine if plants need sunlight and water to grow.
Seeds on the Move	2-LS2-2	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
Earth's Habitats	2-LS4-1 ES	Make observations of plants and animals to compare the diversity of life in different habitats.

GLC - The Changing Earth Unit

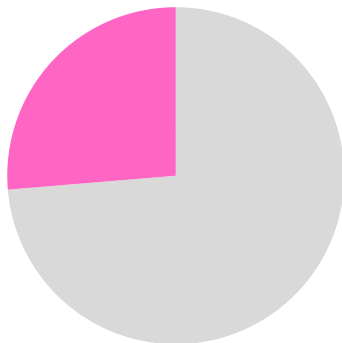
Modeling Landforms	2-ESS2-2	Develop a model to represent the shapes and kinds of land and bodies of water in an area.
Oceans, Lakes & Rivers	2-ESS2-3 ES	Obtain information to identify where water is found on Earth and that it can be solid or liquid.
Earth Changes	2-ESS1-1	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
Preventing Erosion	2-ESS2-1	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.



THIRD GRADE

GLC - UNITS, LABS, STANDARDS, ESSENTIAL STANDARDS

● IN Essential



- GLC Third Grade aligns with ALL 19 National Standards.
- Indiana identified 5 as Essential Standards. **ES**

***Please Note:** In addition to the standards below, Engineering Design standards 3-5-ETS1-1, ETS1-2, ETS1-3 are integrated into GLC Lab Lessons. See Engineering Design Vertical Alignment page 28.

GLC - Forces Unit

GLC - Lab Lesson	Standard	Standard Definition
Balanced & Unbalanced Forces	3-PS2-1 ES	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
Predicting Motion	3-PS2-2	Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
Magnetic Fields	3-PS2-3	Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.
Magnet Fishing	3-PS2-4	Define a simple design problem that can be solved by applying scientific ideas about magnets.

GLC - Nature's Influence Unit

Life Cycles	3-LS1-1 ES	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction and death.
Inherited Traits	3-LS3-1	Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.
Influenced By the Environment	3-LS3-2	Use evidence to support the explanation that traits can be influenced by the environment.
Surviving the Wild	3-LS4-2 ES	Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

GLC - Surviving in a Changing World Unit

Getting Help From Others	3-LS2-1	Construct an argument that some animals form groups that help members survive.
Fossils: Clues to the Past	3-LS4-1	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
What Do I Need to Survive	3-LS4-3	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
Changing Environments	3-LS4-4	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

GLC - Wind, Weather & Water Unit

Wind Direction	3-ESS2-1 ES	Present data in tables and graphical displays to describe typical weather conditions during a particular season.
Weather & Climate	3-ESS2-2	Obtain and combine information to describe climates in different regions of the world.
Water Cycle in a Bag	3-ESS2-3	Use a model to demonstrate how water, in its different forms, moves through the water cycle. Investigate places where water is found in different forms on Earth.
Nature's Fury	3-ESS3-1	Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.



IN Non-Essential

FOURTH GRADE

GLC - UNITS, LABS, STANDARDS, ESSENTIAL STANDARDS

● IN Essential



- GLC Fourth Grade aligns with ALL 17 National Standards.
- Indiana identified 6 as Essential Standards.

***Please Note:** In addition to the standards below, Engineering Design standards 3-5-ETS1-1, ETS1-2, ETS1-3 are integrated into GLC Lab Lessons. See Engineering Design Vertical Alignment page 28.

GLC - Energy Explorers Unit

GLC - Lab Lesson	Standard	Standard Definition
Fast & Slow Bowling	4-PS3-1 ES	Use evidence to construct an explanation relating the speed of an object to the energy of that object.
Static Electricity	4-PS3-2	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat and electric currents.
When Objects Collide	4-PS3-3	Ask questions and predict outcomes about the changes in energy that occur when objects collide.
Electrical Energy	4-PS3-4 ES	Apply scientific ideas to design, test, and refine a device that converts energy from one form to another

GLC - A World of Waves Unit

Make Some Waves	4-PS4-1	Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
Creative Reflections	4-PS4-2	Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
Sending Coded Messages	4-PS4-3	Generate and compare multiple solutions that use patterns to transfer information.

GLC - Nature's Architects Unit

Unique Structures	4-LS1-1 ES	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
Whose Feet?		
Using Senses to Survive	4-LS1-2	Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

GLC - The Earth Beneath Our Feet Unit

Rock Layers: Changes Over Time	4-ESS1-1	Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landscape over time.
Earth Changes-Erosion & Weathering	4-ESS2-1 ES	Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind or vegetation.
Plate Tectonics and Earth's Features	4-ESS2-2	Analyze and interpret data from maps to describe patterns of Earth's features.
Using Natural Resources	4-ESS3-1 ES	Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
Earthquake Resistant	4-ESS3-2 ES	Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.



IN Non-Essential

FIFTH GRADE

GLC - UNITS, LABS, STANDARDS, ESSENTIAL STANDARDS

IN Essential



- GLC Fifth Grade aligns with ALL 16 National Standards.
- Indiana identified 5 as Essential Standards.

***Please Note:** Engineering Design standards 3-5-ETS1-1, ETS1-2, ETS1-3 are integrated into GLC Lab Lessons.

GLC - Mysteries of Matter Unit

GLC - Lab Lesson	Standard	Standard Definition
Particles of Matter	5-PS1-1 ES	Develop a model to describe that matter is made of particles too small to be seen.
Conserving the weight of Matter	5-PS1-2	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating and cooling, or mixing substances, the total weight of matter is conserved.
Observing Properties of Matter	5-PS1-3 ES	Make observations and measurements to identify materials based on their properties.
Mixing Up Matter	5-PS1-4	Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
Movement of Matter	5-PS2-1	Support an argument that the gravitational force exerted by Earth on objects is directed down.

GLC - Nature's Balance Unit

Plant Survival	5-LS1-1	Support an argument that plants get the materials they need for growth chiefly from air and water.
Food Chains	5-LS2-1 ES	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
Ecosystem Diorama		
Food Webs	5-PS3-1	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.

GLC - Interconnected Earth Unit

Why So Bright?	5-ESS1-1	Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.
Seasonal Sky Changes	5-ESS1-2 ES	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.
Water, Water Everywhere	5-ESS2-2	Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
Interconnected Spheres	5-ESS2-1	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere and/or atmosphere interact.
Protecting Our Resources	5-ESS3-1 ES	Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

GLC - The Power of Simple Machines Unit

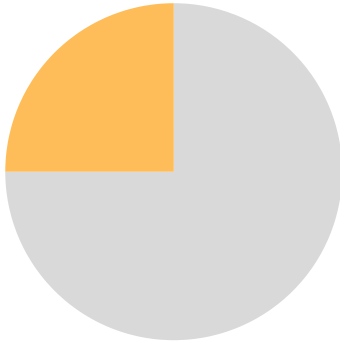
Amazing Adventures with Wedges & Levers	3-5 ETS1-1 3-5 ETS1-2 3-5 ETS1-3	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time or cost. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. 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.
Inclined Planes & Screws in Action		
Wheels in Motion: Wheel & Axle and Pulley		
Rube Goldberg: Using Simple Machines		



SIXTH GRADE

GLC - UNITS, LABS, STANDARDS, ESSENTIAL STANDARDS

● IN Essential



- GLC Sixth Grade aligns with ALL 16 National Standards.
- Indiana identified 4 as Essential Standards.

***Please Note:** In addition to the standards below, Engineering Design standards MS-ETS1-1, ETS1-2, ETS1-3, ETS1-4 are integrated into GLC Lab Lessons. See Engineering Design Vertical Alignment page 28.

GLC - Waves Around Us Unit

GLC - Lab Lesson	Standard	Standard Definition
Modeling Waves	MS-PS4-1	Use mathematical representations to describe a simple model for waves that includes how the amplification of a wave is related to the energy in a wave.
Exploring Sound Waves Exploring Light Waves	MS-PS4-2 ES	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
Digital vs Analog	MS-PS4-3	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

GLC - Earth's Sky Unit

Sun, Earth, Moon	MS-ESS1-1 ES	Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
Lunar Phases		Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
Eclipses		Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
Seasons		Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

GLC - Our Solar System Unit

Inner Solar System	MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.
Outer Solar System		
Solar System Scale Model		
Gravity	MS-ESS1-2	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

GLC - Exploring Ecosystems Unit

Ecosystem Populations	MS-LS2-1	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
Interactions in Ecosystems	MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
Energy Flow	MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
	MS-LS1-6 ES	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
Ecosystem Populations	MS-LS2-4 ES	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
	MS-LS2-5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.



Vertical Alignment



GLC Curriculum & Cognitive Load

Grade Level Certified (GLC) Curriculum effectively manages cognitive load, fostering a deeper understanding and retention of scientific concepts among students. The following is a summary of its strengths and impact on students in regards to cognitive load:



Chunking Information and Clear Instructions:

- Breaks down complex scientific concepts into smaller, manageable sections.
- Step-by-step instructions that are easy to follow. Reduces extraneous cognitive load.



Graphic Instruction Guides (GIGs):

- Compliments textual instructions, providing a dual coding approach that helps students better understand and retain information.



Hands-On Learning and Use of Simple Materials:

- Makes abstract scientific concepts tangible which reduces cognitive load by providing concrete experiences.
- Uses simple, everyday materials, minimizing the extraneous load associated with unfamiliar or complex materials. This simplicity allows students to focus on the scientific concepts rather than on understanding how to use the materials.



Scaffolded Learning:

- Designed to build on previous knowledge ensuring a gradual increase in complexity that helps manage cognitive load.



Reflective Assessments:

- The assessments reinforce understanding through retrieval practice and provide opportunities for formative feedback, helping to solidify knowledge.



Transforming Education

ETHOS GLC Curriculum's Impact on Student Success

Foundational Learning

Integrated Knowledge: Students receive a comprehensive and interconnected understanding of various subjects.

Conceptual Understanding: Students grasp fundamental scientific concepts through hands-on activities and real-world applications deepening their understanding and retention of key ideas.

Academic Preparation

Skill Development: Emphasis on critical thinking, problem-solving, and hands-on learning prepares students for the academic challenges they will face in higher grades. These skills are essential for success in advanced coursework.

Educational Attainment

Consistent Achievement: With comprehensive coverage of standards, students perform well in assessments and standardized tests, reflecting a consistent level of academic achievement.

Long-Term Success: A robust education foundation increases the likelihood of high educational attainment.

Career Path

Early Exposure to STEM Careers: This exposure can inspire interest and motivation to pursue STEM-related fields.

Career Readiness: Students gain insights into how classroom learning applies to real-world professions, which can help them make informed decisions about their future career paths.

Engagement and Motivation

The hands-on and interactive activities keeps students engaged and motivated. When students are actively involved in their learning, they are more likely to develop a curiosity about science and a love for learning.

Development of Critical Thinking Skills

The inquiry-based approach fosters critical thinking and problem-solving skills. Students learn to ask questions, form hypotheses, conduct experiments, and analyze data, which are essential skills for academic success and real-world applications.

Support for Diverse Learners

The clear instructions, visual aids, and scaffolded learning support diverse learners. GLCs design ensures that all students have the opportunity to succeed.

Enhanced Understanding & Retention

Students build a deeper and more lasting understanding of scientific concepts. Students retain and can apply what they have learned.

Preparation for Standardized Testing

The curriculum's alignment with the national standards and its integration of cross-disciplinary skills prepare students for standardized assessments. By practicing with questions and activities that mirror test formats, students build confidence and competence in their test-taking abilities.

College & Career Readiness

The skills and knowledge acquired through the GLC Curriculum ensure that students are well-prepared for college-level coursework and competitive job markets. Their ability to connect classroom learning to real-world applications enhances their readiness for future challenges.



Physical Science

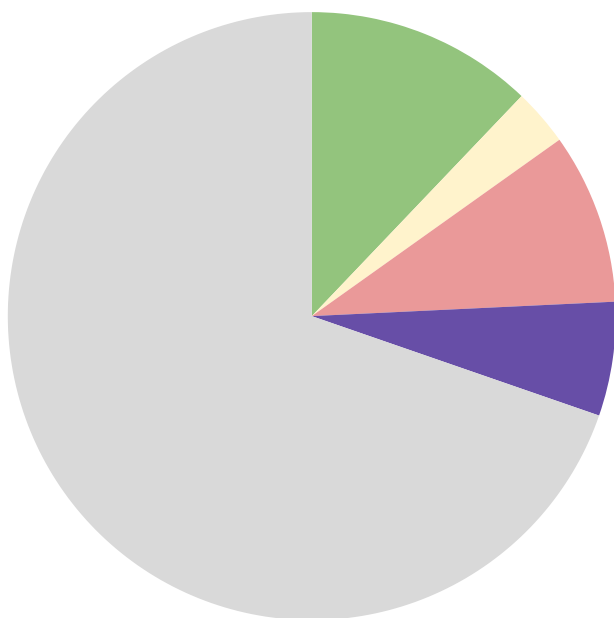
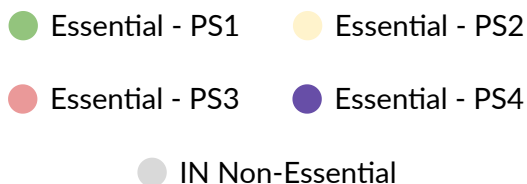
GLC Vertical Alignment

	Matter and its Interactions (PS1)				Motion and Stability (PS2)				Energy (PS3)				Waves & their Applications (PS4)			
	PS1-1	PS1-2	PS1-3	PS1-4	PS2-1	PS2-2	PS2-3	PS2-4	PS3-1	PS3-2	PS3-3	PS3-4	PS4-1	PS4-2	PS4-3	PS4-4
Kdg									ES							
1st													ES			
2nd	ES	ES														
3rd					ES											
4th									ES			ES				
5th	ES		ES													
6th														ES		

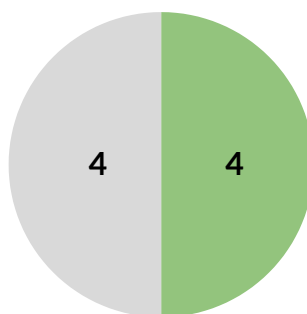
Number of Standards by Physical Science Area

Grades K-6:

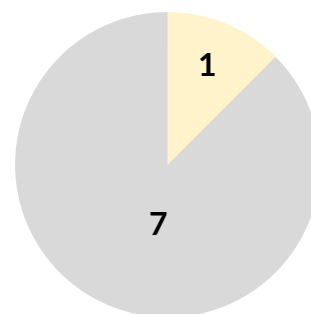
- 33 National Standards in Physical Science.
- Indiana identified 10 as essential standards.



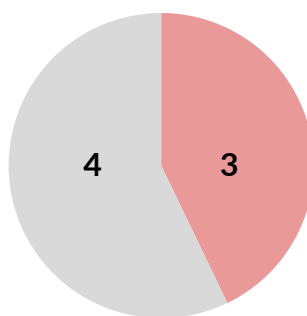
Matter and its Interactions (PS1)



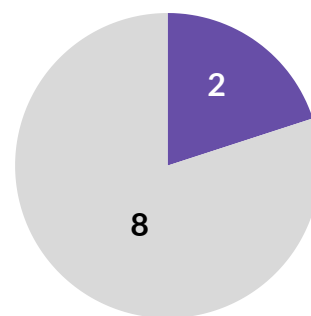
Motion and Stability (PS2)



Energy (PS3)



Waves & their Applications (PS4)

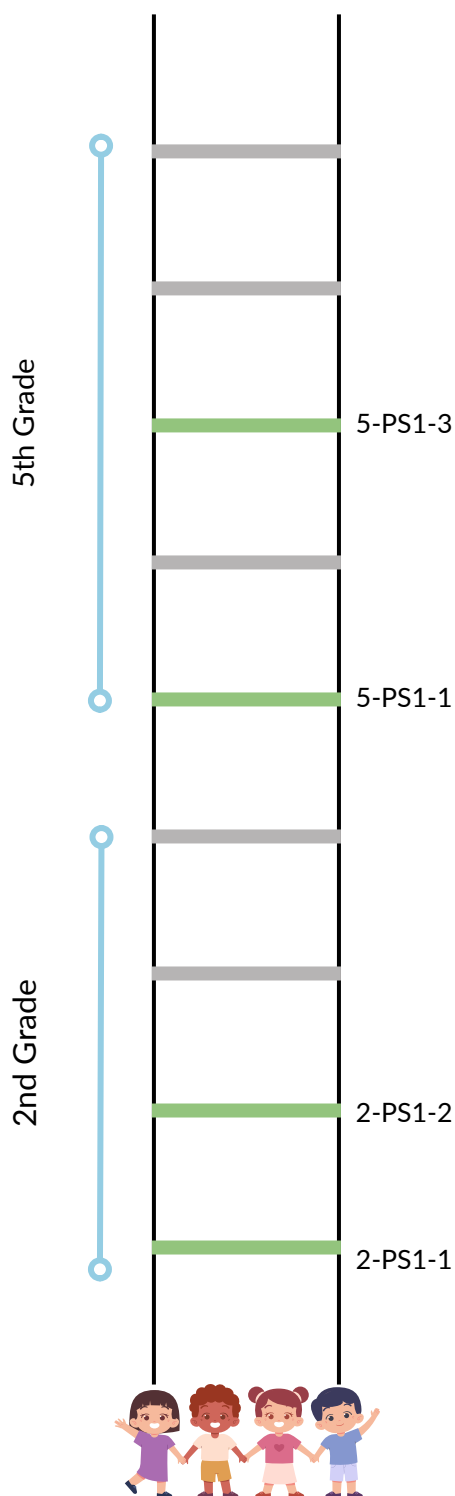




Matter and its Interactions

Physical Science - Vertical Alignment

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards

- IN Essential Standards
- IN Non - Essential Standards

2nd Grade - GLC Exploring Matter		
2-PS1-1	Physical Properties of Matter	Plan and carry out an investigation to describe and sort different materials based on what you can see and feel."
2-PS1-2	Absorption:Paper Towel Test	Examine data from testing materials to find out which ones are best for a specific use.
2-PS1-3	Objects & Pieces	Observe how an object made of a few parts can be taken apart and used to make a new object, and explain this with evidence
2-PS1-4	Reversible & Irreversible Changes	Use evidence to argue that some changes from heating or cooling can be reversed, but others cannot."

5th Grade - GLC Mysteries of Matter		
5-PS1-1	Particles of Matter	Develop a model to show that matter is made of tiny particles we can't see.
5-PS1-2	Conserving the weight of Matter	Measure and graph to show that when heating, cooling, or mixing substances, the total weight stays the same.
5-PS1-3	Observing Properties of Matter	Make observations and measurements to identify materials based on their properties.
5-PS1-4	Mixing Up Matter	Investigate to find out if mixing two or more substances creates new substances.
5-PS2-1*From Energy subunit	Movement of Matter	Support an argument that Earth's gravity pulls objects downward

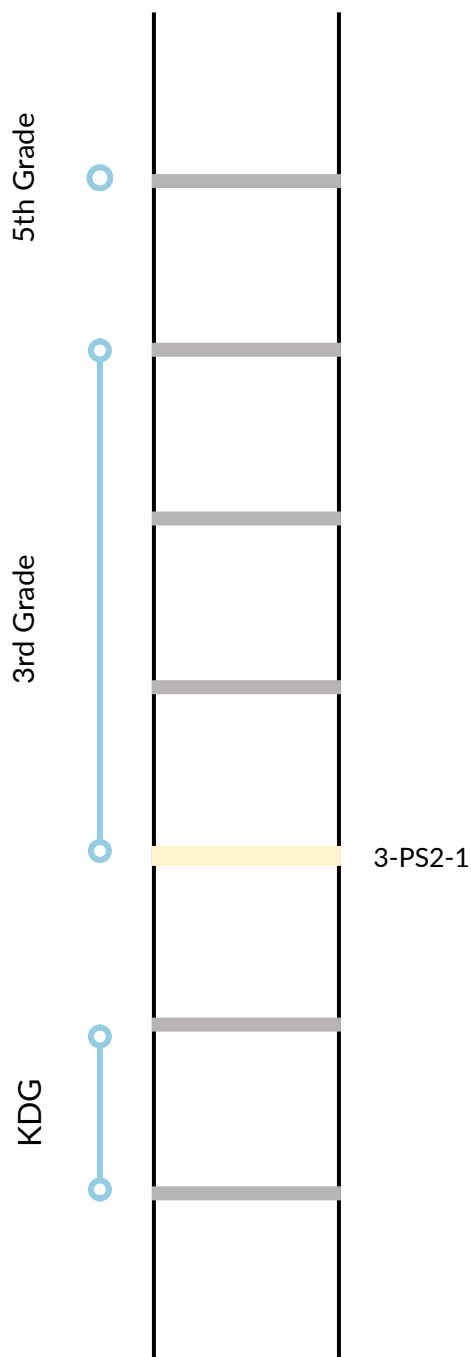


Motion and Stability:

Forces and Interactions

Physical Science - Vertical Alignment

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards

- IN Essential Standards
- IN Non - Essential Standards

Kdg - GLC Magic Motion

K-PS2-1	Bumper Cars	Investigate how different strengths and directions of pushes and pulls affect an object's movement."
K-PS2-2	Ramping Up	Analyze data to see if a design successfully changes an object's speed or direction using a push or pull.
	Applied Force	

3rd Grade - GLC Forces

3-PS2-1	Balanced & Unbalanced Forces	Investigate to show how balanced and unbalanced forces affect an object's movement
3-PS2-2	Predicting Motion	Observe and measure an object's movement to show that patterns can predict future motion
3-PS2-3	Magnetic Fields	Ask questions to find out how electric or magnetic forces between two objects affect each other without touching.
3-PS2-4	Magnet Fishing	Define a simple design problem that can be solved by applying scientific ideas about magnets

5th Grade - GLC Mysteries of Matter

5-PS2-1	Movement of Matter	Support an argument that Earth's gravity pulls objects downward
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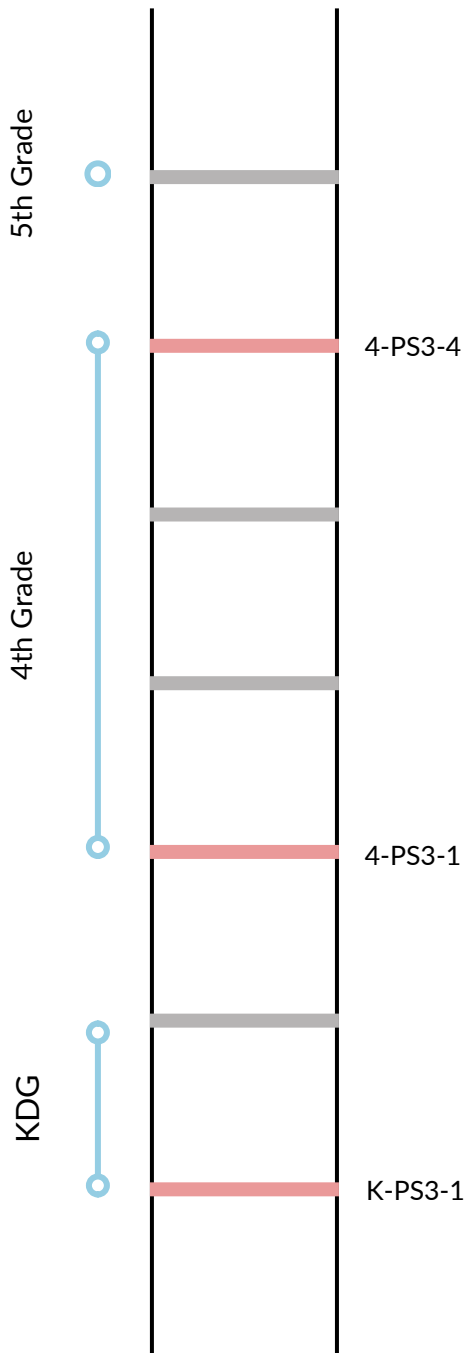




Energy

Physical Science - Vertical Alignment

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards

- IN Essential Standards
- IN Non - Essential Standards

Kdg - GLC Weather Watchers

K-PS3-1	Soaking Up the Sun	Make observations to determine the effect of sunlight on Earth's surface.
K-PS3-2	Safety First	Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on an area.

4th Grade - GLC Energy Explorers

4-PS3-1	Fast & Slow Bowling	Use evidence to explain how an object's speed is related to its energy
4-PS3-2	Static Electricity	Make observations to show evidence that energy can move from place to place by sound, light, heat and electric currents.
4-PS3-3	When Objects Collide	Ask questions and predict what happens to energy when objects collide
4-PS3-4	Electrical Energy	Apply scientific ideas to design, test, and refine a device that changes energy from one form to another

5th Grade - GLC Nature's Balance

5-PS3-1	Food Webs	Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) originally came from the sun.
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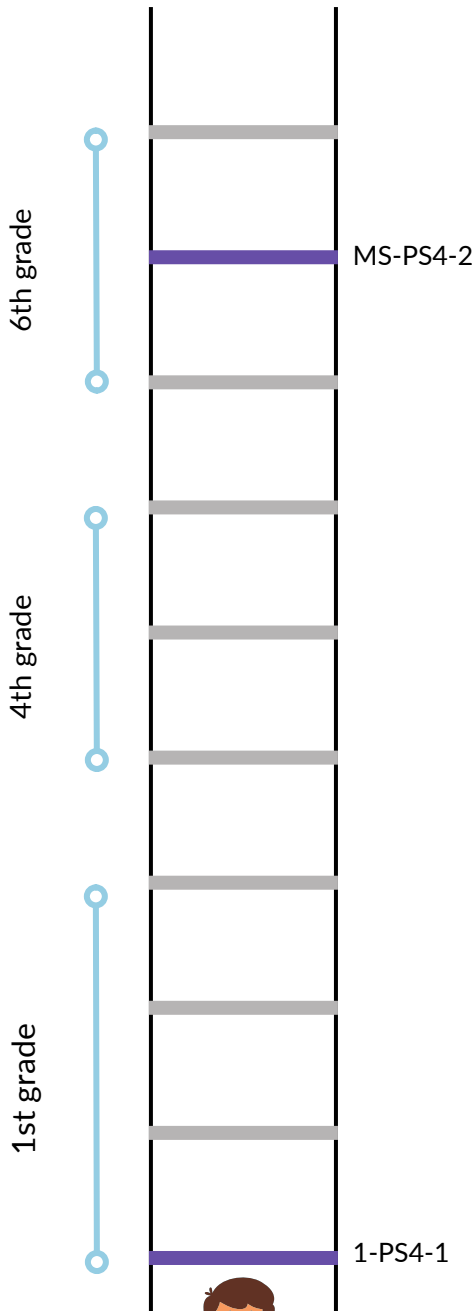


Waves and their Applications in Technologies for Information Transfer

Physical Science - Vertical Alignment

Waves & their Applications (PS4)				
	PS4-1	PS4-2	PS4-3	PS4-4
K-2				
1st				
2nd				
3rd				
4th				
5th				
6th				

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards

- IN Essential Standards
- IN Non - Essential Standards

1st Grade - GLC Sound and Light

1-PS4-1	Rubber Band Guitar	Vibrating materials make sound and sound makes materials vibrate
1-PS4-2	Peepbox	You need light to see.
1-PS4-3	Can You See Through Me?	Investigate how different materials affect a beam of light when placed in its path
1-PS4-4	Paper Cup Phone	Use tools and materials to design and build a device that uses light or sound to communicate over a distance.

4th Grade - GLC A World of Waves

4-PS4-1	Make Some Waves	Develop a model of waves to show patterns of amplitude and wavelength, and how waves can move objects
4-PS4-2	Creative Reflections	Develop a model to show that we see objects because light reflects off them and enters our eyes
4-PS4-3	Sending Coded Messages	Generate and compare multiple solutions that use patterns to transfer information.

6th Grade - GLC Waves Around Us

MS-PS4-1	Modeling Waves	Use math to describe a simple wave model showing how the amplification of a wave is related to its energy.
MS-PS4-2	Exploring Sound Waves Exploring Light Waves	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
MS-PS4-3	Digital vs Analog	Combine qualitative scientific and technical information to support that digital signals are more reliable than analog signals for encoding and sending information.



Life Science

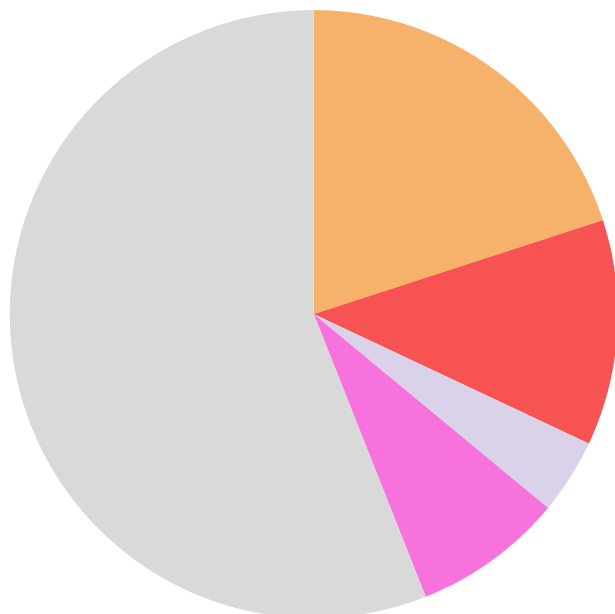
GLC Vertical Alignment

	From Molecules to Organisms (LS1)						Ecosystems (LS2)					Heredity (LS3)			Biological Evolution (LS4)			
	LS1-1	LS1-2	LS1-3	LS1-4	LS1-5	LS1-6	LS2-1	LS2-2	LS2-3	LS2-4	LS2-5	LS3-1	LS3-2	LS3-3	LS4-1	LS4-2	LS4-3	LS4-4
Kdg	ES																	
1st	ES																	
2nd							ES								ES			
3rd	ES											ES				ES		
4th	ES																	
5th							ES											
6th						ES				ES								

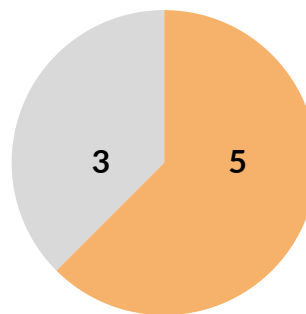
Number of Standards by Life Science Area

Grades K-6:

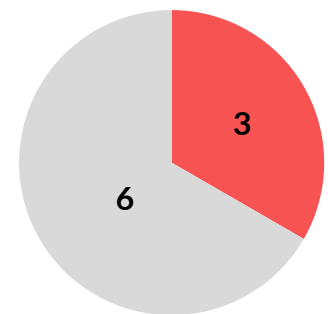
- 25 National Standards in Life Science.
- Indiana identified **11** as essential standards.



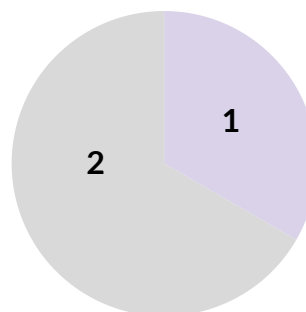
Molecules--Organisms (LS1)



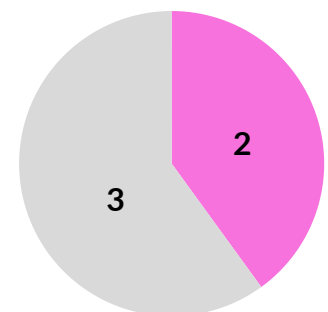
Ecosystems (LS2)



Heredity (LS3)



Biological Evolution (LS4)

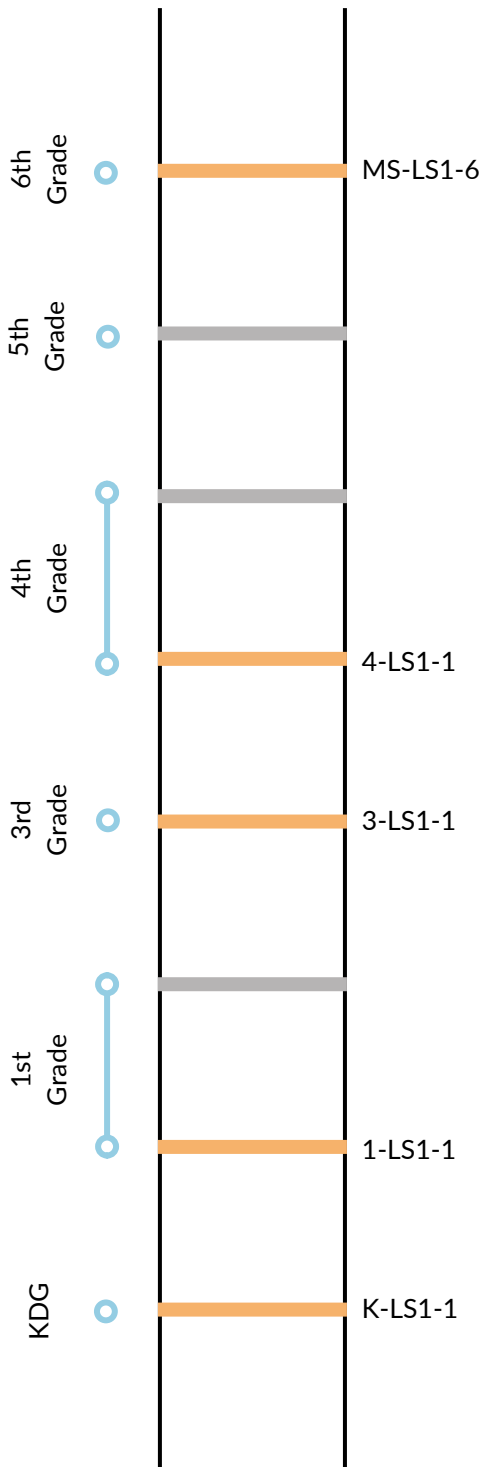




From Molecules to Organisms: Structures and Processes

Life Science - Vertical Alignment

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards

- IN Essential Standards
- IN Non - Essential Standards

Kdg - GLC Our Living World		
K-LS1-1	Survival Skills	Observe and describe patterns of what plants and animals (including humans) need to survive.
1st Grade - GLC Nature's Lessons		
1-LS1-1	Biomimicry	Use materials to design a solution to a human problem by mimicking /copying how plants and/or animals use their external parts to help them survive, grow and meet their needs.
1-LS1-2	Parents Help Offspring	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
3rd Grade - GLC Nature's Influence		
3-LS1-1	Life Cycles	Develop models to describe that organisms have unique and diverse life cycles but all have birth, growth, reproduction and death in common.
4th Grade - GLC Nature's Architects		
4-LS1-1	Unique StructuresWhose Feet?	Construct and argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
4-LS1-2	Using Senses to Survive	Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
5th Grade - GLC Nature's Balance		
5-LS1-1	Plant Survival	Support an argument that plants get the materials they need for growth chiefly from air and water.
6th Grade - GLC Exploring Ecosystems		
MS-LS1-6	Energy Flow	Explain with evidence the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

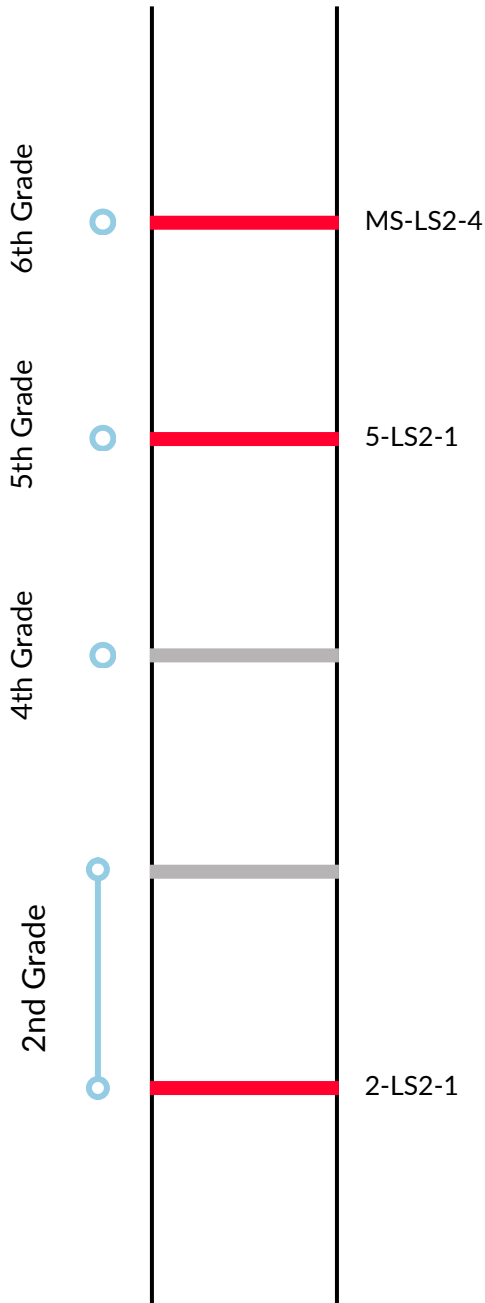




Ecosystems: Interactions, Energy and Dynamics

Life Science - Vertical Alignment

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards

- IN Essential Standards
- IN Non - Essential Standards

2nd Grade - GLC Investigating Plants & Habitats

2-LS2-1	Seed to Feed	Plan and conduct an investigation to determine if plants need sunlight and water to grow.
2-LS2-2	Seeds on the Move	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

3rd Grade - GLC Surviving in a Changing World

3-LS2-1	Getting Help From Others	Construct an argument that some animals form groups that help members survive.
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5th Grade - GLC Nature's Balance

5-LS2-1	Food Chains	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
	Ecosystem Diorama	

6th Grade - GLC Exploring Ecosystems

MS-LS2-4	Ecosystem Populations	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
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Heredity:

Inheritance and Variation & Traits

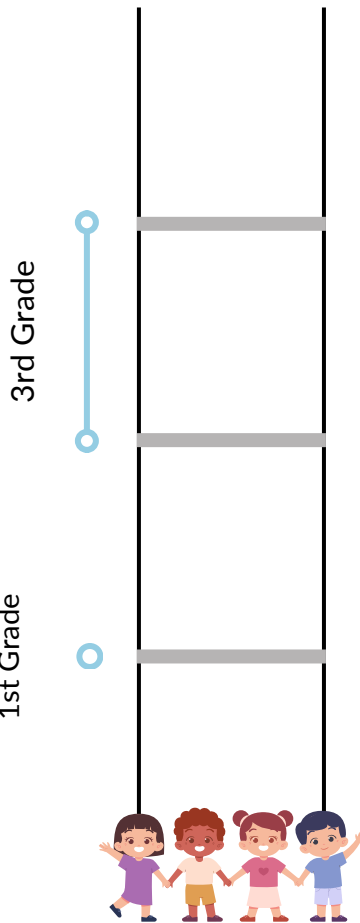
Life Science - Vertical Alignment

Standards "Ladder"
for Learning & Success

GLC Units Meets All National Standards

☐ Indiana identified 0 standards in Heredity

☐ IN Non - Essential Standards



1st Grade - Nature's Lessons

1-LS3-1	Are You My Family?	Make observations to construct an evidence based account that young plants and animals are like, but not exactly like, their parents.
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3rd Grade - Nature's Influence

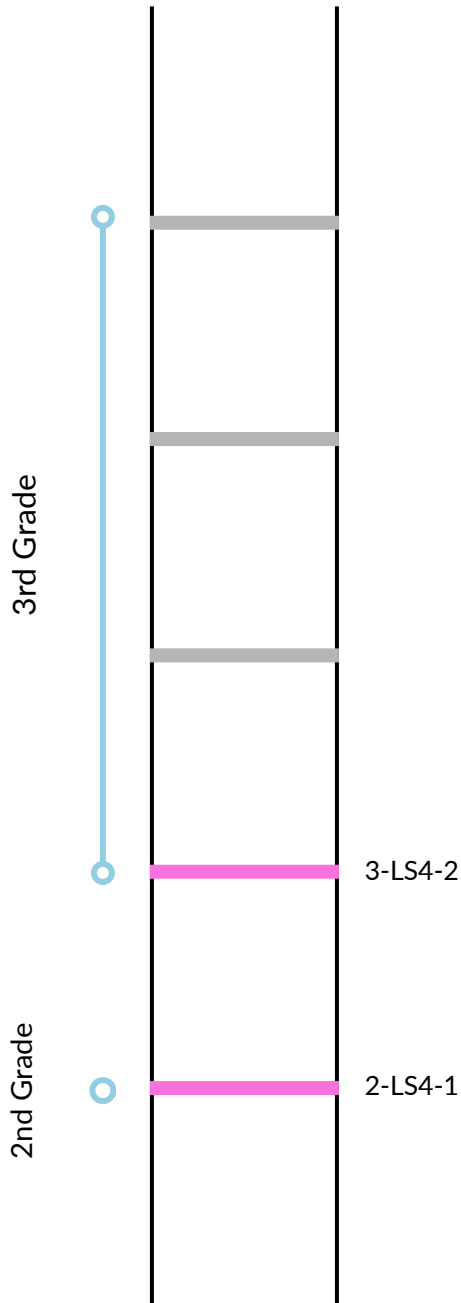
3-LS3-1	Inherited Traits	Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.
3-LS3-2	Influenced By the Environment	Use evidence to support the explanation that traits can be influenced by the environment.



Biological Evolution: Unity and Diversity

Life Science - Vertical Alignment

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards

- IN Essential Standards
- IN Non - Essential Standards

2nd Grade - GLC Investigating Plants & Habitats		
2-LS4-1	Earth's Habitats	Make observations of plants and animals to compare the diversity of life in different habitats.

3rd Grade - GLC Nature's Influence		
3-LS4-2	Surviving the Wild	Use evidence to construct and explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

3rd Grade - GLC Surviving in a Changing World		
3-LS4-1	Fossils: Clues to the Past	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
3-LS4-3	What Do I Need to Survive	Construct and argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
3-LS4-4	Changing Environments	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.



Earth and Space Science

GLC Vertical Alignment

	Earth's Place in Universe (ESS1)			Earth's Systems (ESS2)			Earth & Human Activity (ESS3)		
	ESS1-1	ESS1-2	ESS1-3	ESS2-1	ESS2-2	ESS2-3	LS3-1	LS3-2	LS3-3
Kdg				ES				ES	
1st		ES							
2nd						ES			
3rd									
4th				ES			ES	ES	
5th		ES		ES			ES		
6th	ES								

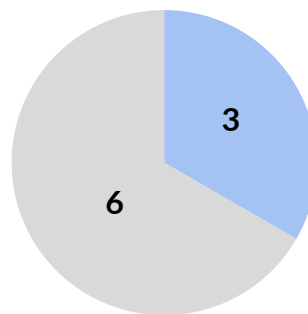
Number of Standards by Earth and Space Science Area

Grades K-6:

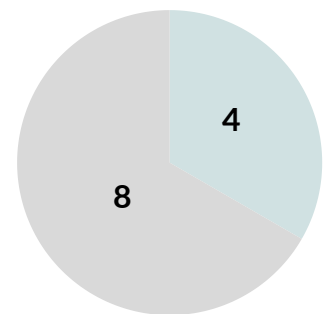
- 28 National Standards in Earth and Space Science.
- Indiana identified 11 as essential standards.

● Essential - ESS1 ● Essential - ESS2
● Essential - ESS3 ● IN Non-Essential

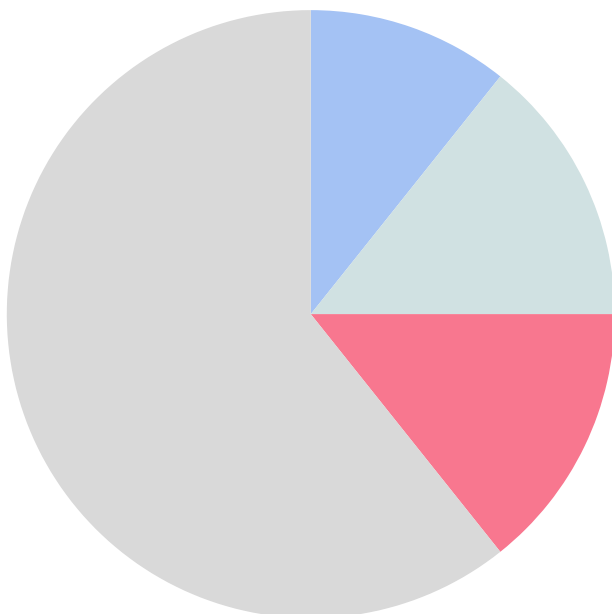
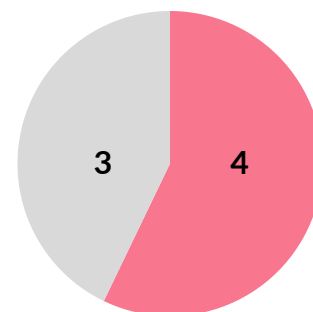
Earth's Place in Universe (ESS1)



Earth's Systems (ESS2)



Earth & Human Activity (ESS3)

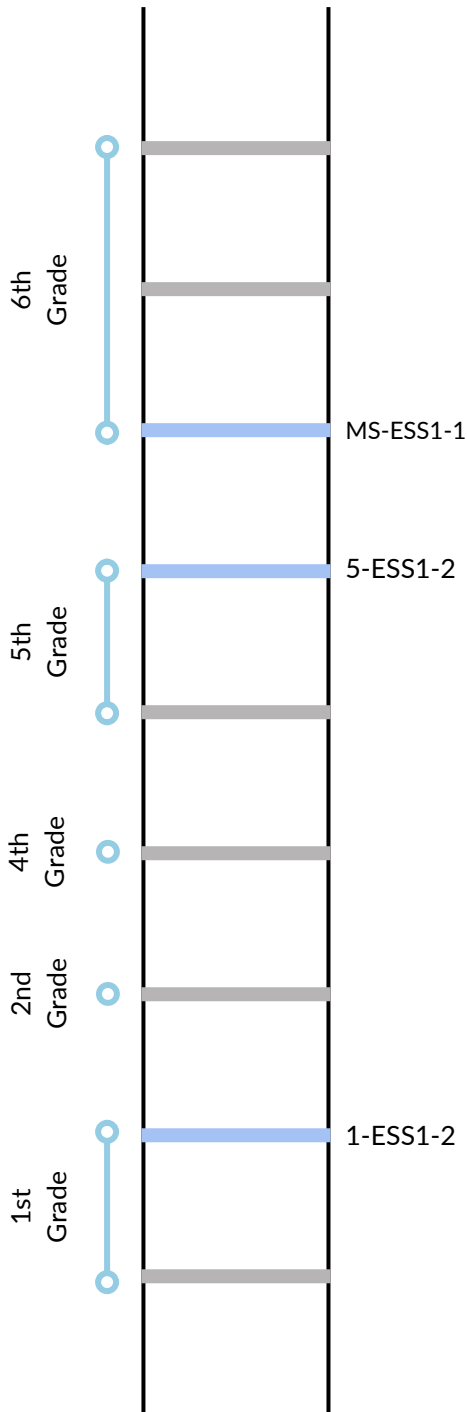




Earth's Place in the Universe

Earth and Space Science - Vertical Alignment

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards



IN Essential Standards



IN Non - Essential Standards

1st Grade - GLC Sun, Moon & Stars

1-ESS1-1	Patterns in the Sky	Use observation of the sun, moon and stars to describe patterns that can be predicted.
	Twinkle Twinkle Little Constellation	
1-ESS1-2	Following the Sun	Make observations at different times of the year to relate the amount of daylight to the time of year.

2nd Grade - GLC The Changing Earth

2-ESS1-1	Earth Changes	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
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4th Grade - GLC The Earth Beneath Our Feet

4-ESS1-1	Rock Layers: Changes Over Time	Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landscape over time.
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5th Grade - GLC Interconnected Earth

5-ESS1-1	Why So Bright?	Support and argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.
5-ESS1-2	Seasonal Sky Changes	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.

6th Grade - GLC Earth's Sky

MS-ESS1-1	Sun, Earth, Moon	Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
	Lunar Phases	
	Eclipses	
	Seasons	

6th Grade - GLC Our Solar System

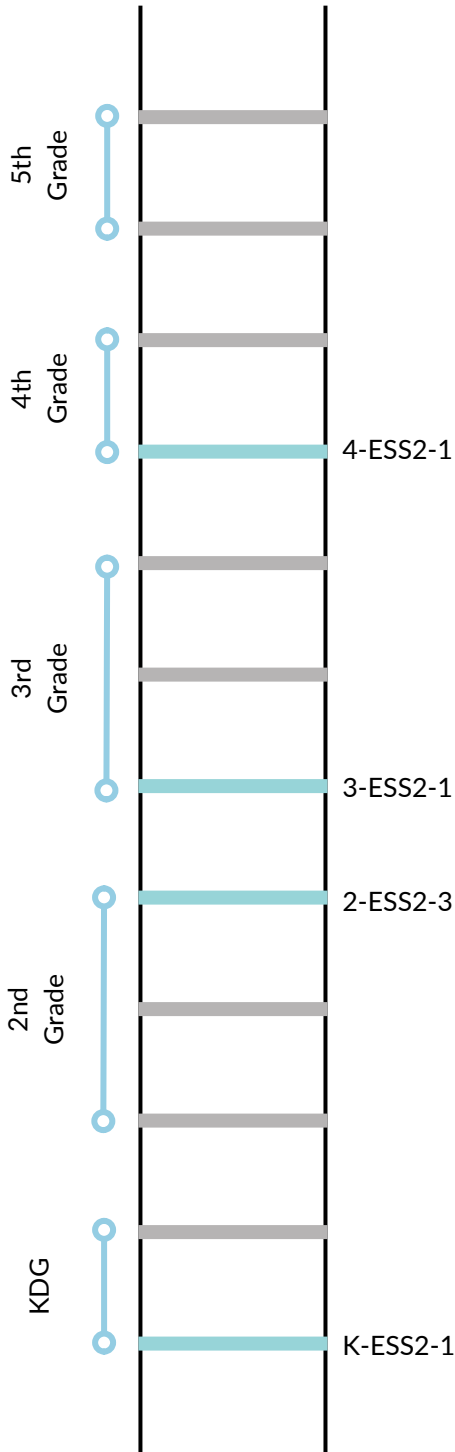
MS-ESS1-3	Inner Solar System	Analyze and interpret data to determine scale properties of objects in the solar system.
	Outer Solar System	
	Solar System Scale Model	
MS-ESS1-2	Gravity	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.



Earth's Systems

Earth and Space Science - Vertical Alignment

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards

- IN Essential Standards
- IN Non - Essential Standards

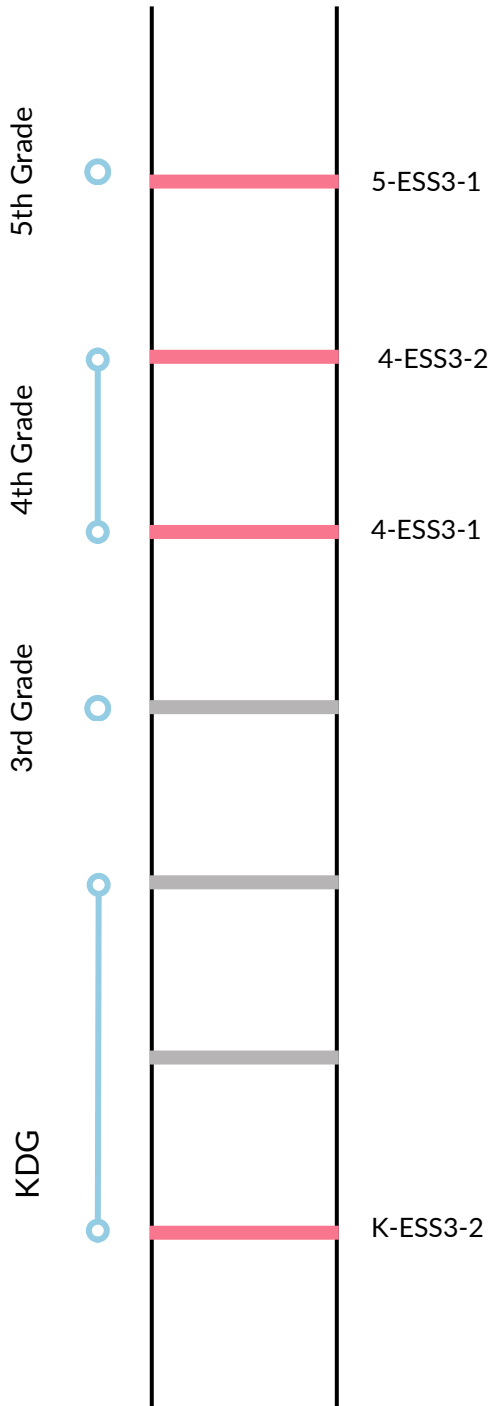
Kdg - GLC Weather Watchers		
K-ESS2-1	What's the Weather?	Use and share observations of local weather conditions to describe patterns over time.
Kdg - GLC Our Living World		
K-ESS2-2	I Need You	Use evidence to argue how plants and animals (including humans) change the environment to meet their needs.
2nd Grade - GLC The Changing Earth		
2-ESS2-1	Earth Changes	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
2-ESS2-2	Modeling Landforms	Develop a model to represent the shapes and kinds of land and bodies of water in an area.
2-ESS2-3	Oceans, Lakes & Rivers	Obtain information to identify where water is found on Earth and that it can be solid or liquid.
3rd Grade - GLC Wind, Weather & Water		
3-ESS2-1	Wind Direction	Present data in tables and graphical displays to describe typical weather conditions during a particular season.
3-ESS2-2	Weather & Climate	Obtain and combine information to describe climates in different regions of the world.
3-ESS2-3	Water Cycle in a Bag	Use a model to demonstrate how water, in its different forms, moves through the water cycle. Investigate places where water is found in different forms on Earth.
4th Grade - GLC The Earth Beneath Our Feet		
4-ESS2-1	Earth Changes-Erosion & Weathering	Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind or vegetation.
4-ESS2-2	Plate Tectonics and Earth's Features	Analyze and interpret data from maps to describe patterns of Earth's features.
5th Grade - GLC Interconnected Earth		
5-ESS2-2	Water, Water Everywhere	Describe and graph the amounts of salt water and fresh water in different places to provide evidence about the distribution of water on Earth.
5-ESS2-1	Interconnected Spheres	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere and/or atmosphere interact.



Earth & Human Activity

Earth and Space Science - Vertical Alignment

Standards "Ladder" for Learning & Success



GLC Units Meets All National Standards

■ IN Essential Standards

■ IN Non - Essential Standards

Kdg - GLC Weather Watchers		
K-ESS3-2	What's the Weather?	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.

Kdg - GLC Our Living World		
K-ESS3-1	I Need You	Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
K-ESS3-3	Better Together	Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

3rd Grade - GLC Wind, Weather & Water		
3-ESS3-1	Nature's Fury	Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

4th Grade - GLC The Earth Beneath Our Feet		
4-ESS3-1	Using Natural Resources	Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
4-ESS3-2	Earthquake Resistant	Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

5th Grade - GLC Interconnected Earth		
5-ESS3-1	Protecting Our Resources	Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.



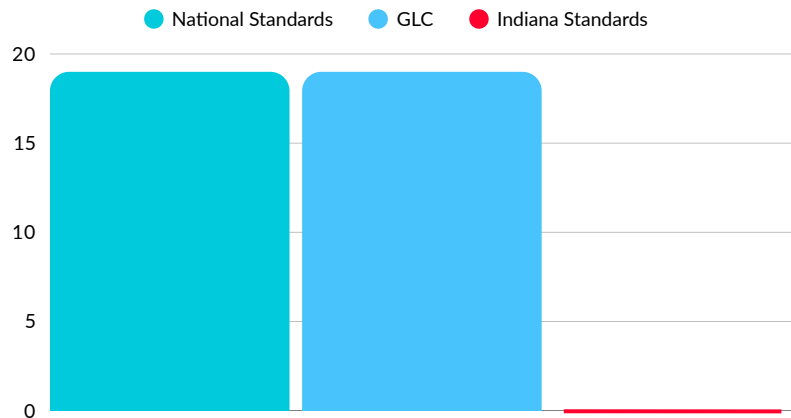


Engineering Design

GLC Vertical Alignment

Grades K-6:

- 22 National Standards in Engineering Design.
- Indiana identified 0 as essential standards.



	Engineering Design (ETS1)			
	ETS1-1	ETS1-2	ETS1-3	ETS1-4
Kdg				
1st				
2nd				
3rd				
4th				
5th				
6th				

Grades K-2 ETS		
K-2-ETS1-1		Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
K-2-ETS1-2		Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
K-2-ETS1-3		Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
Grades 3-5 ETS		
3-5 ETS1-1		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 ETS1-2		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 ETS1-3		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.



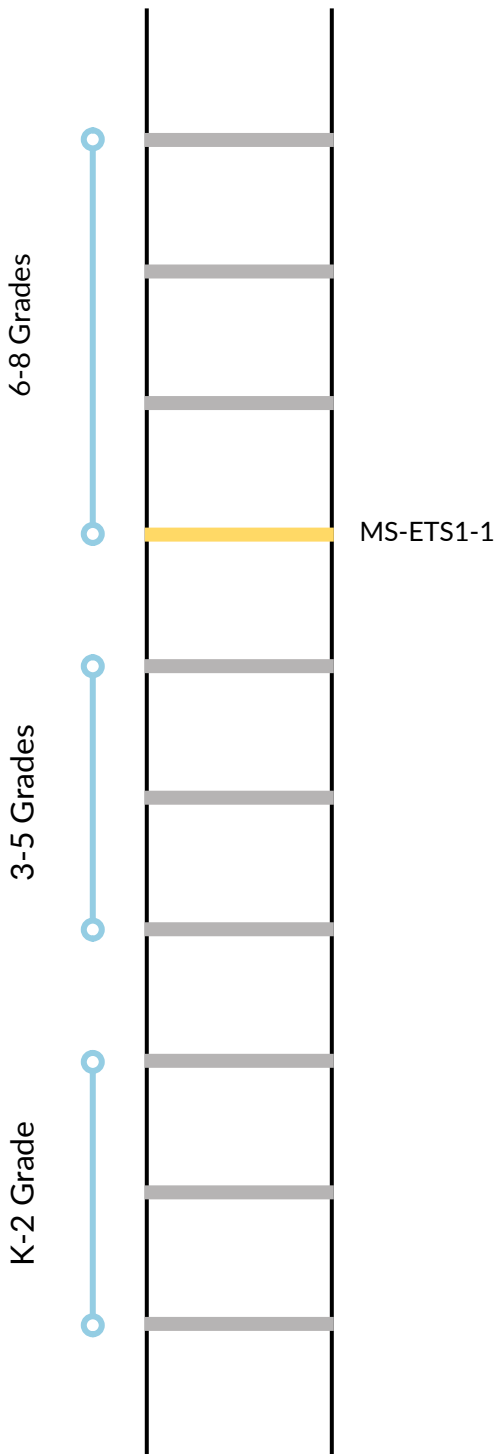
Engineering Design

GLC Vertical Alignment

Standards “Ladder” for Learning & Success”

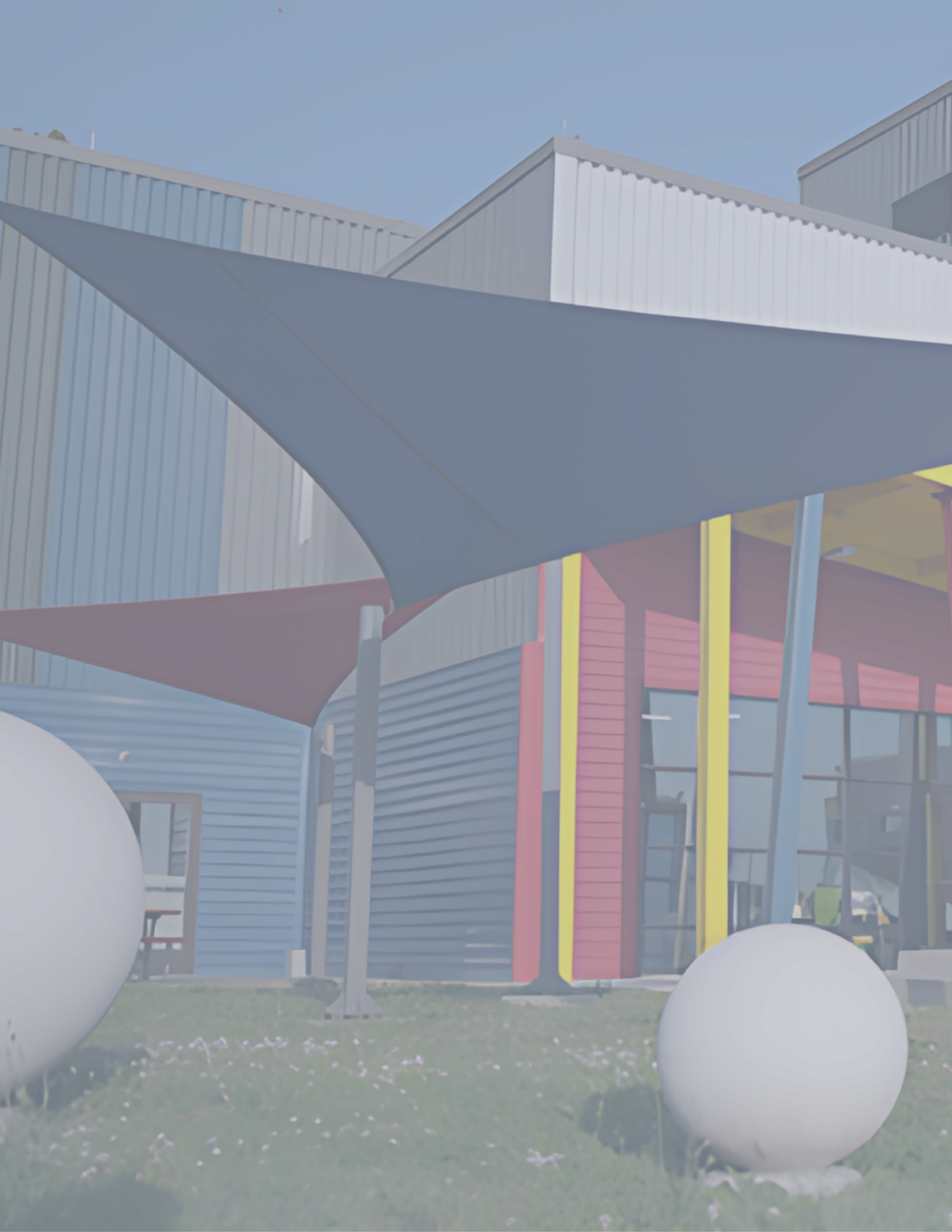
GLC Units Meets All National Standards

- IN Essential Standards
- IN Non - Essential Standards



Grades (6-8) MS - ETS		
MS-ETS1-1	Only considered an Essential Standard in 8th grade.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
MS-ETS1-2		Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
MS-ETS1-3		Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
MS-ETS1-4		Develop a model to generate data for iterative testing and modification of a proposed object, tool or process such that an optimal design can be achieved.







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"Curriculum Mapping" Video



"What is GLC?" Video

