GaDOE Science Updates and Resources

Metro RESA

August 15, 2023

Welcome from the GaDOE Science Team

Keith Crandall,

Science Program Manager

Renee Shirley-Stevens,

Science Program Specialist

Laura Canepa-Redondo,

Science/ ESOL Program Specialist

Judie Beccaro,

Content Integration Special Education Specialist

3 Ways to Stay In Touch with the GaDOE Science Team

Reach out via email:
Keith Crandall, Science Program Manager,
kcrandall@doe.k12.ga.us

Judie Beccaro, Content Integration and Special Education Specialist in Science
Judith.Beccaro@doe.k12.ga.us

Laura Canepa-Redondo, ESOL Science Program Specialist,
Laura.Canepa-Redondo@doe.k12.ga.us

Renee Shirley-Stevens, Science Program Specialist,
renee.shirley-stevens@doe.k12.ga.us

Follow Us in Twitter:
@GaDOEScience

Sign up for our Science Listserv to receive the latest updates:

To receive, send a blank email to any of these:

- **Science K-5**: join-science-k-5@list.doe.k12.ga.us
- **Science 6-8:** join-science-6-8@list.doe.k12.ga.us
- **Science 9-12:** join-science-9-12@list.doe.k12.ga.us

The Vision for Science Education in the Georgia Standards of Excellence

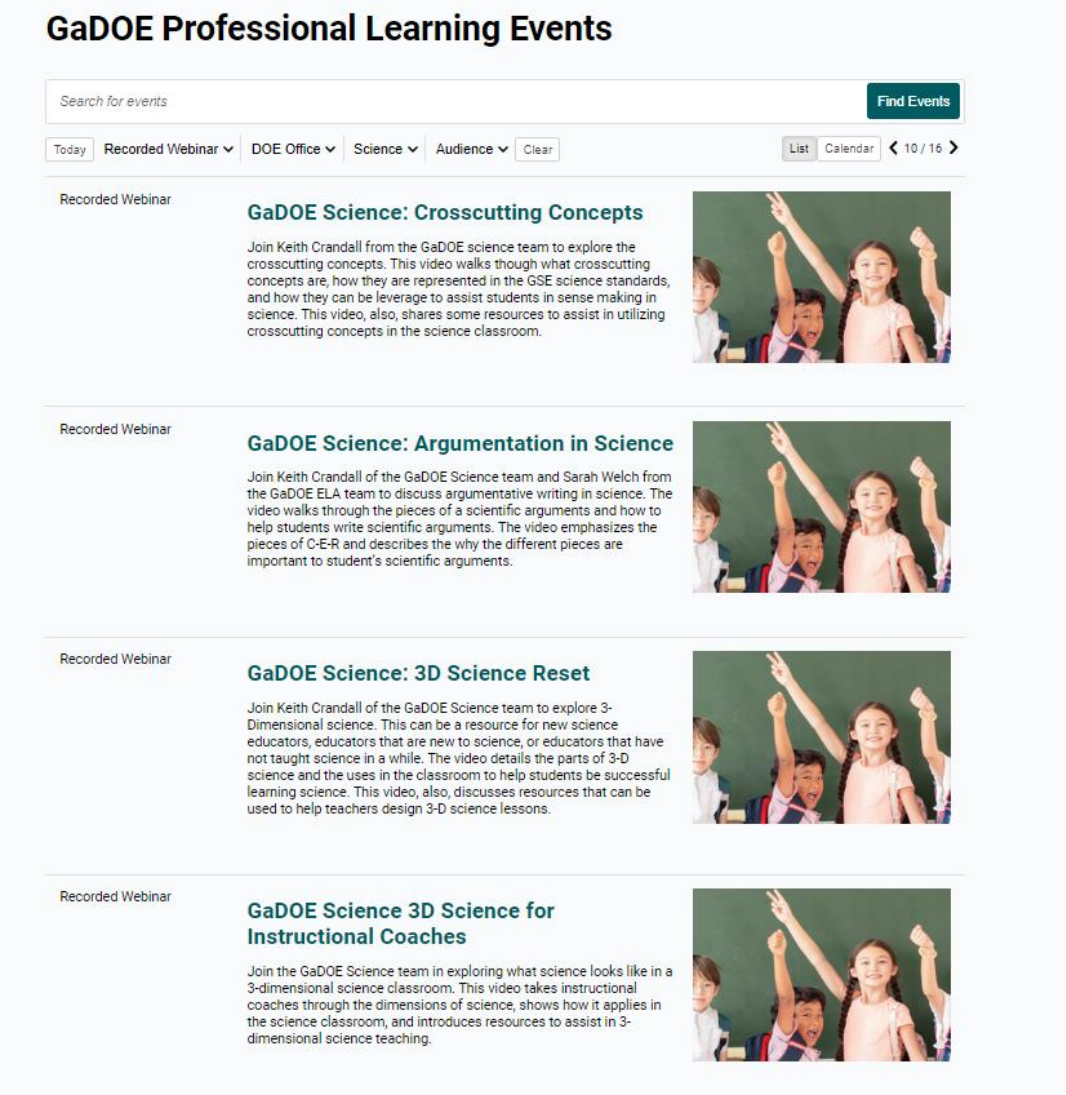
Students, over multiple years of school, actively engage in science and engineering practices and apply crosscutting concepts to deepen their understanding of the core ideas in these fields.

Students should be involved in "figuring out" not just "learning about" science.

Our efforts are aimed at igniting curiosity and keeping students always wondering about the world around them!

Professional Learning

Professional Learning Catalog

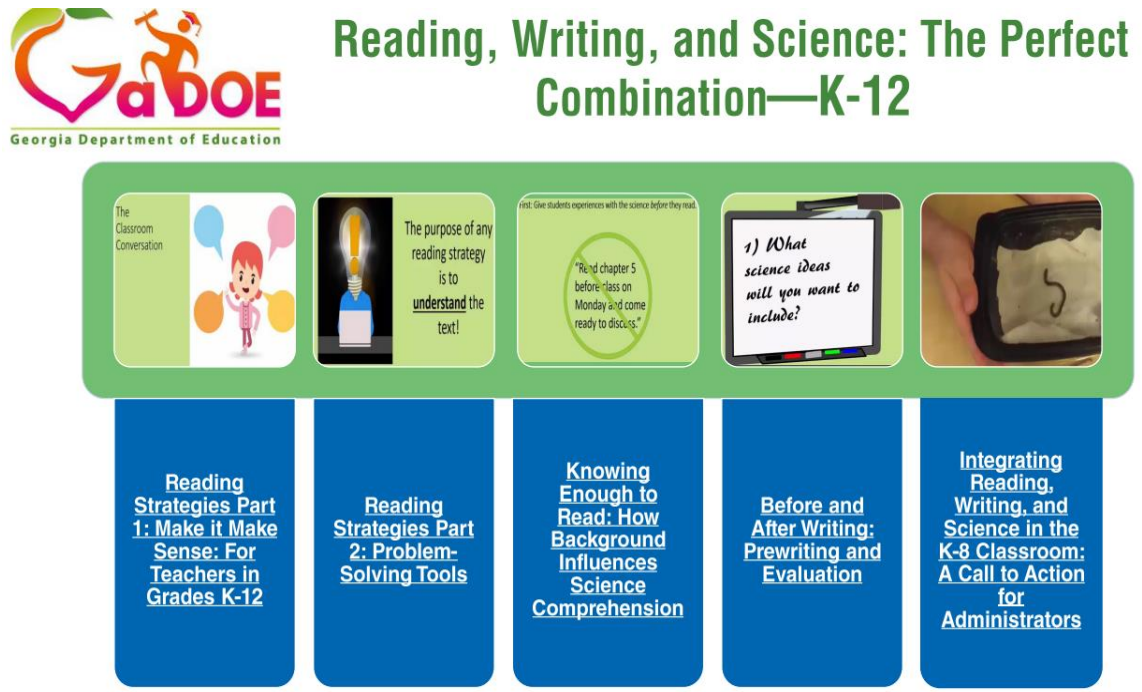


- GaDOE Professional Learning Catalog

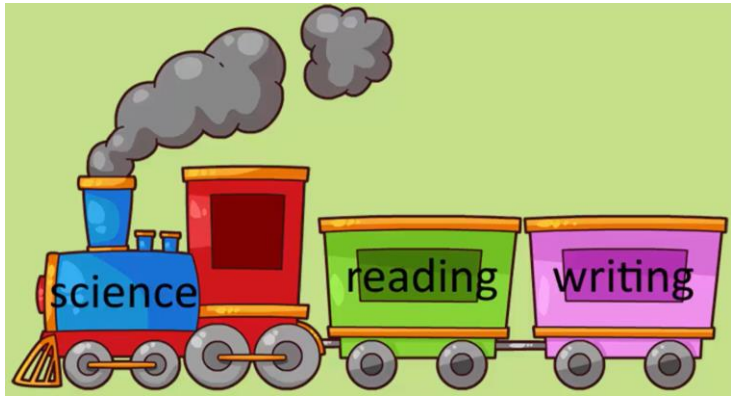
  - Science Professional Learning

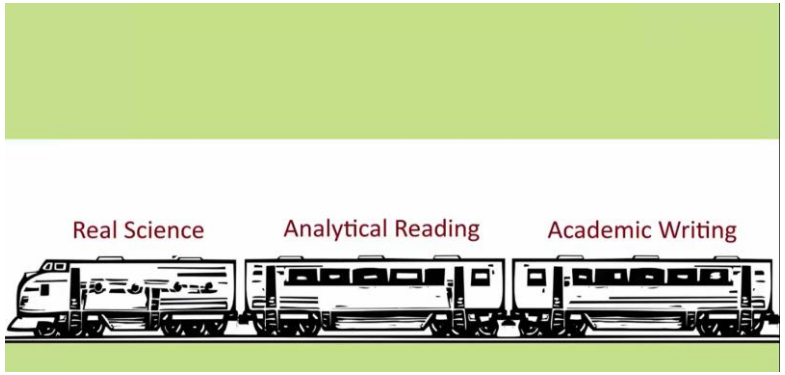
Reading, Writing, and Science: The Perfect Combination

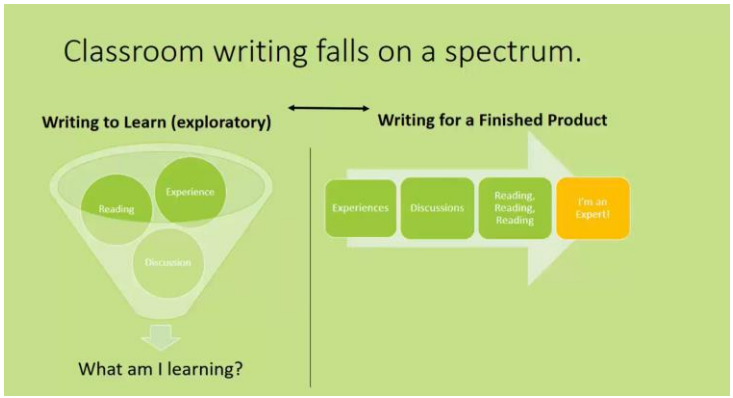
- This playlist focuses on integrating literacy into science lessons.
- Provides ideas to support students in reading, writing and science.
- Resources to go with the videos

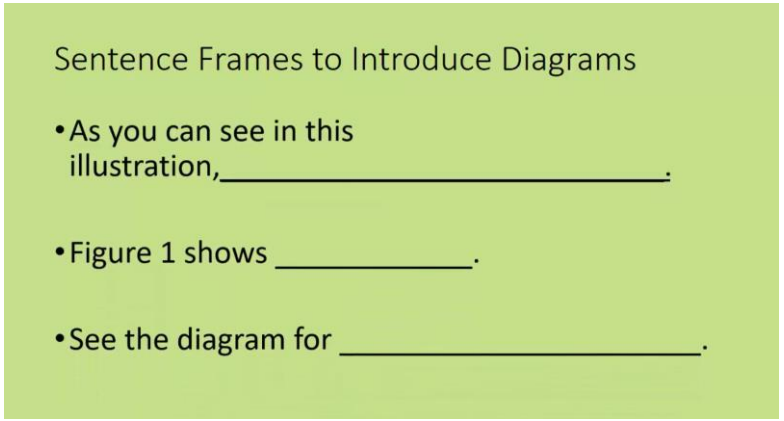


Literacy Videos



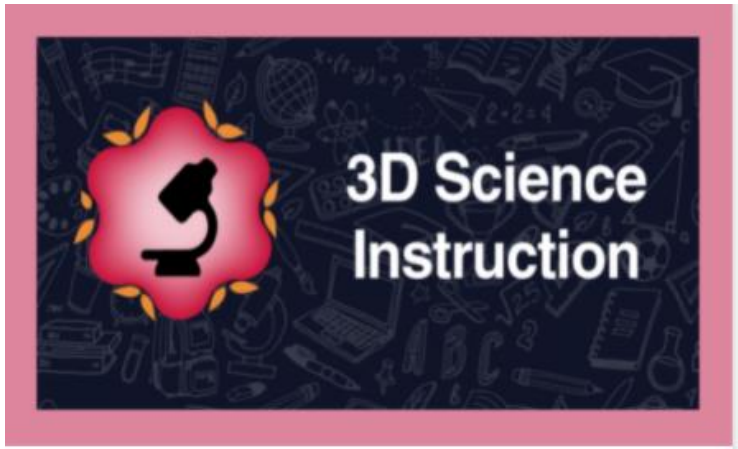






Self-Paced PL

- Only available through the PL tab of SLDS
- Earn a badge for completion!
- 3D Science Instruction
- 3D Science Lesson Design and Supports for All Students



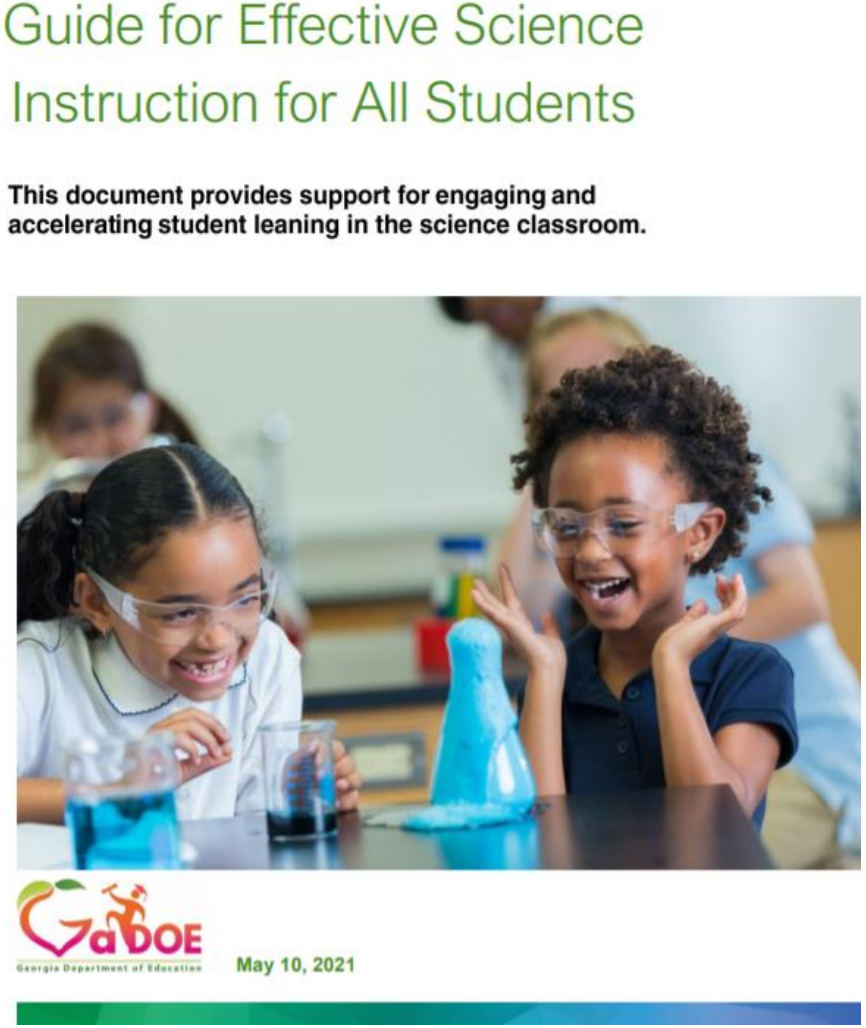
Three Dimensional Science Instruction

3D Science Lesson Design and Supports for All Students

Course Resources

Guide for Effective Science Instruction for All Students

- Accelerating Learning



Progressions

How do standards build from one grade to the next?

Core Idea Progressions for Grades K-8

Purpose: These charts can be used to follow the progression of Disciplinary Core ideas through grade levels K-8 and includes a description for how to connect the standards in a way that helps a student continue progressing when learning about the disciplinary core ideas of science.

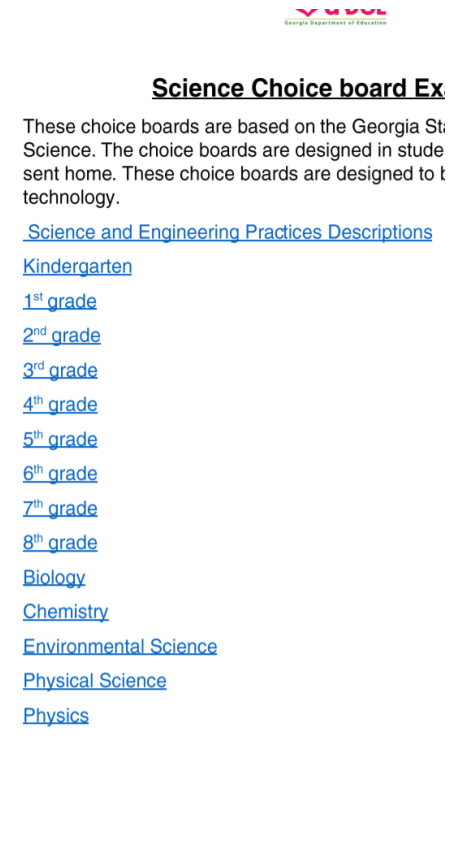
Instructions for Using This Document: Find the grade that you teach in the hyperlinked chart below and click the link to take you to the chart associated with that grade level. In addition to the standards for your grade level, you will find where the students encountered the disciplinary core idea in the standards prior to your grade level and where the disciplinary core idea will be built upon in later years. The first column is the standard for the grade level, the second column is where the students have encountered the disciplinary core idea most recently, the next column provides a description of the connection between the recent core idea and the current standard, and then the final column provides the next standard that will help build on the core idea through eighth grade. This document is designed to assist in understanding how the disciplinary core ideas develop over time and may also be helpful in building on the disciplinary core ideas.

Kindergarten	1st grade	2nd grade
3rd grade	4th grade	5th grade
6th grade	7th grade	8th grade

2nd Grade

Standard	Where have students seen this core idea before?	Description of Connection	Where will students see this core idea again?
S2E1	S1E1	❖ The teacher can have students make observations about different types of weather, weather patterns in their areas and identify different types of precipitation. Have students discuss how the weather varies by season. Then teachers can have students construct explanations about the causes and effects of weather on the school grounds.	S4E1
S2E2	SKE1	❖ The teacher should have students make observations about the sky during the day and at night. The teacher can then have students develop a model to communicate how the sky is changing during the day and at night. The students can then link to the patterns that they noticed in the sun and moon. The students should make observations about how the sun moves and changes shadows, how the day length changes and how the moon changes over time.	S4E2
S2E3	S1E1	❖ The teacher can have students make observations about different types of weather, weather patterns in their areas and identify different types of precipitation. Have students discuss how the weather varies by season. Then teachers can have students construct explanations about the causes and effects of weather on the school grounds.	S3L2
S2P1	SKP1 (a, b)	❖ Students should explore the physical characteristics of different objects that are made of different materials. Students should use their senses and basic science tools to classify common objects. Students can then describe how structures can be built from smaller building blocks that can be taken apart and rearranged to build new structures. Students can then observe and describe how some changes in matter are permanent and others are reversible.	S3P1/S5P1
S2P2	SKP2	❖ The teacher can have students plan and carry out investigations about motion of objects and how physical attributes of an object affect the motion. The student can then add pushing and pulling the object to the investigation. The student can then design a device to change the speed or the direction of an object and collect data to decide if the solution works as intended on the motion of the object.	S4P3
S2L1	S1L1	❖ Students can develop models to identify the different parts of a plant. Then students can plan and carry out an investigation about the life cycle of a plant from a seed and then record observations as the plant grows. The students can then compare their models to the observations that they made during the investigation. Finally, students can construct an explanation about an animal's role in dispersing seeds or pollination of plants.	S5L1

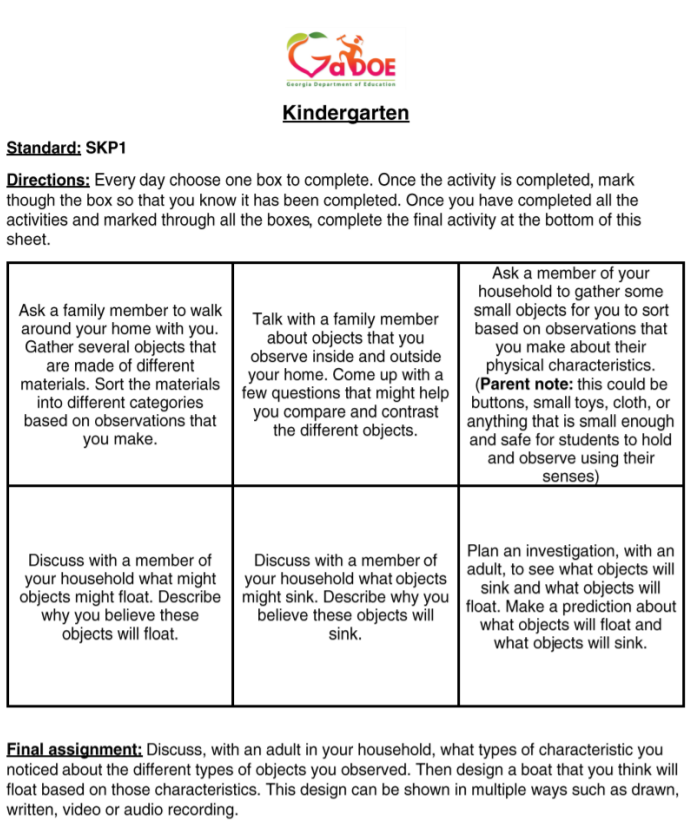
Choice Boards



Science Choice board Ex

These choice boards are based on the Georgia St
Science. The choice boards are designed in stude
sent home. These choice boards are designed to b
technology.

Science and Engineering Practices Descriptions
Kindergarten
1st grade
2nd grade
3rd grade
4th grade
5th grade
6th grade
7th grade
8th grade
Biology
Chemistry
Environmental Science
Physical Science
Physics



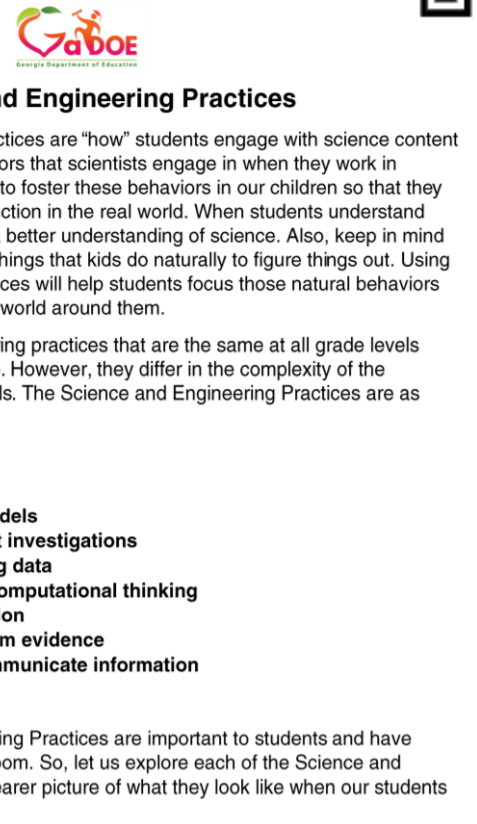
Kindergarten

Standard: SKP1

Directions: Every day choose one box to complete. Once the activity is completed, mark though the box so that you know it has been completed. Once you have completed all the activities and marked through all the boxes, complete the final activity at the bottom of this sheet.

Ask a family member to walk around your home with you. Gather several objects that are made of different materials. Sort the materials into different categories based on observations that you make.	Talk with a family member about objects that you observe inside and outside your home. Come up with a few questions that might help you compare and contrast the different objects.	Ask a member of your household to gather some small objects for you to sort based on observations that you make about their physical characteristics. (**Parent note:** this could be buttons, small toys, cloth, or anything that is small enough and safe for students to hold and observe using their senses)
Discuss with a member of your household what might objects might float. Describe why you believe these objects will float.	Discuss with a member of your household what objects might sink. Describe why you believe these objects will sink.	Plan an investigation, with an adult, to see what objects will sink and what objects will float. Make a prediction about what objects will float and what objects will sink.

Final assignment: Discuss, with an adult in your household, what types of characteristic you noticed about the different types of objects you observed. Then design a boat that you think will float based on those characteristics. This design can be shown in multiple ways such as drawn, written, video or audio recording.



Science and Engineering Practices

Engineering Practices are "how" students engage with science content
e are the behaviors that scientists engage in when they work in
areers. We want to foster these behaviors in our children so that they
w scientists' function in the real world. When students understand
, they will have a better understanding of science. Also, keep in mind
behaviors are things that kids do naturally to figure things out. Using
gineering practices will help students focus those natural behaviors
ence affects the world around them.

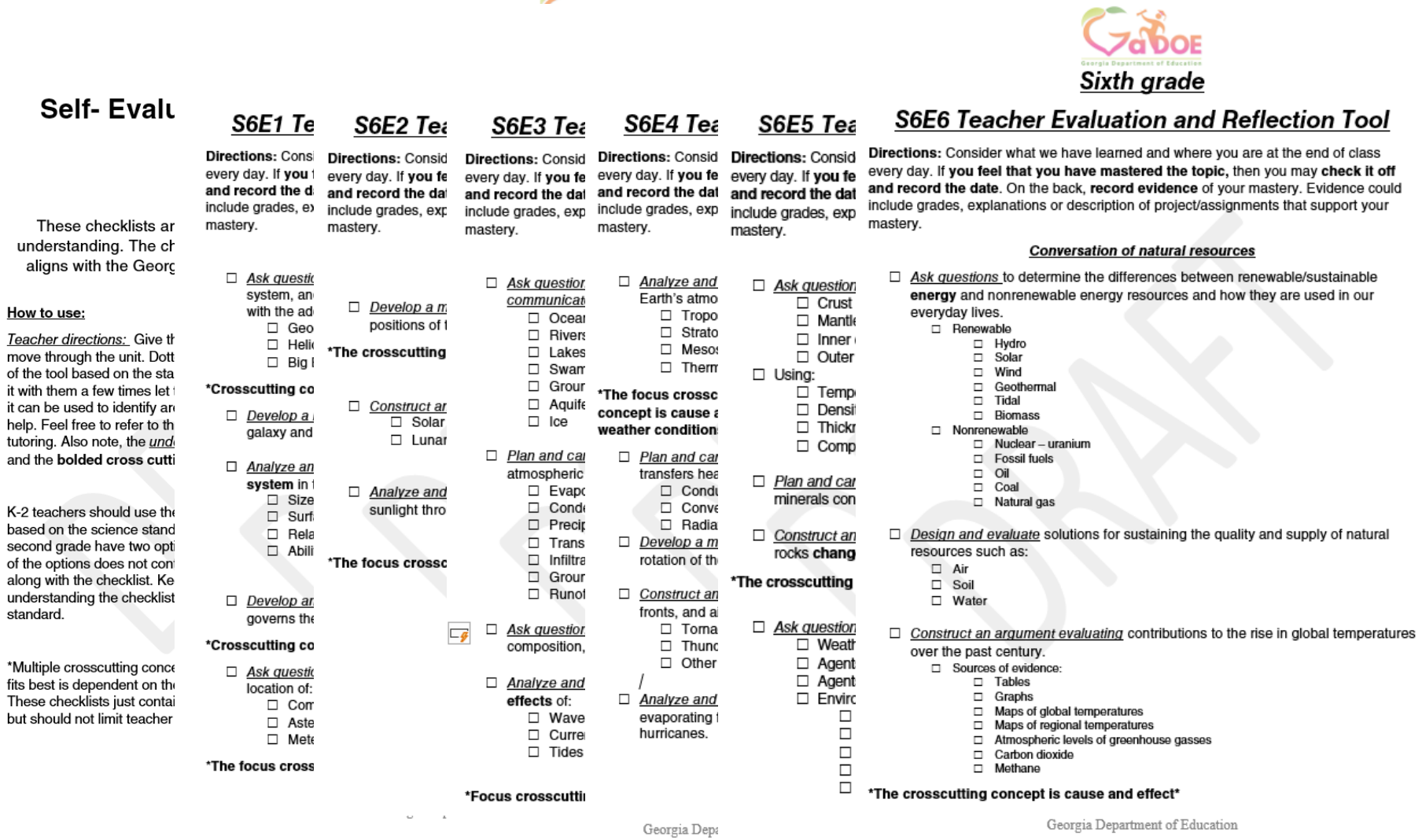
ce and Engineering practices that are the same at all grade levels
gh twelfth grade. However, they differ in the complexity of the
rious grade levels. The Science and Engineering Practices are as

estions
g and using models
nd carrying out investigations
and interpreting data
hematics and computational thinking
ng an explanation
n argument from evidence
aluate, and communicate information

ce and Engineering Practices are important to students and have
ns in the classroom. So, let us explore each of the Science and
ices to give a clearer picture of what they look like when our students

Choice boards Link

Self-Evaluation Checklist Example



Self- Evalu

These checklists ar
understanding. The ch
aligns with the Georg

How to use:

Teacher directions: Give th
move through the unit. Dott
of the tool based on the sta
it with them a few times let
it can be used to identify ar
help. Feel free to refer to th
tutoring. Also note, the *und*
and the **bolded cross cutti**

K-2 teachers should use the
based on the science stand
second grade have two opti
of the options does not con
along with the checklist. Ke
understanding the checklist
standard.

*Multiple crosscutting conce
fits best is dependent on th
These checklists just contai
but should not limit teacher

Sixth grade

S6E1 Te

Directions: Consi
every day. If **you**
and record the d
include grades, e
mastery.

☐ *Ask questi*
system, an
with the ad
☐ Geo
☐ Heli
☐ Big

***Crosscutting co**

☐ *Develop a*
galaxy and

☐ *Analyze an*
system in
☐ Size
☐ Surf
☐ Rela
☐ Abili

☐ *Develop ar*
governs the

***Crosscutting co**

☐ *Ask questi*
location of:
☐ Con
☐ Aste
☐ Mete

***The focus cross**

S6E2 Tea

Directions: Consid
every day. If **you fe**
and record the dat
include grades, exp
mastery.

☐ *Develop a m*
positions of t

***The crosscutting**

☐ *Construct ar*
☐ Solar
☐ Lunar

☐ *Analyze and*
sunlight thro

***The focus crossc**

S6E3 Tea

Directions: Consid
every day. If **you fe**
and record the dat
include grades, exp
mastery.

☐ *Ask questior*
communicat
☐ Ocear
☐ Rivers
☐ Lakes
☐ Swam
☐ Grour
☐ Aquife
☐ Ice

☐ *Plan and car*
atmospheric
☐ Evapo
☐ Conde
☐ Precip
☐ Trans
☐ Infiltra
☐ Grour
☐ Runol

☐ *Ask questior*
composition,

☐ *Analyze and*
effects of:
☐ Wave
☐ Curre
☐ Tides

***Focus crosscutti**

S6E4 Tea

Directions: Consid
every day. If **you fe**
and record the dat
include grades, exp
mastery.

☐ *Analyze and*
Earth's atmo
☐ Tropo
☐ Strato
☐ Meso
☐ Therm

***The focus crossc**
concept is cause a
weather condition

☐ *Plan and car*
transfers hea
☐ Condu
☐ Conve
☐ Radia

☐ *Develop a m*
rotation of th

☐ *Construct an*
fronts, and a
☐ Torna
☐ Thunc
☐ Other

/

☐ *Analyze and*
evaporating
hurricanes.

Georgia Dep

S6E5 Tea

Directions: Consid
every day. If **you fe**
and record the dat
include grades, exp
mastery.

☐ *Ask questior*
☐ Crust
☐ Mantle
☐ Inner
☐ Outer

☐ Using:
☐ Temp
☐ Densi
☐ Thickr
☐ Comp

☐ *Plan and car*
minerals con

☐ *Construct an*
rocks **chang**

***The crosscutting**

☐ *Ask questior*
☐ Weath
☐ Agent
☐ Agent
☐ Enviro
☐
☐
☐
☐
☐

S6E6 Teacher Evaluation and Reflection Tool

Directions: Consider what we have learned and where you are at the end of class every day. If **you feel that you have mastered the topic,** then you may **check it off and record the date**. On the back, **record evidence** of your mastery. Evidence could include grades, explanations or description of project/assignments that support your mastery.

Conversation of natural resources

☐ *Ask questions* to determine the differences between renewable/sustainable **energy** and nonrenewable energy resources and how they are used in our everyday lives.
- ☐ Renewable
  - ☐ Hydro
  - ☐ Solar
  - ☐ Wind
  - ☐ Geothermal
  - ☐ Tidal
  - ☐ Biomass
- ☐ Nonrenewable
  - ☐ Nuclear – uranium
  - ☐ Fossil fuels
  - ☐ Oil
  - ☐ Coal
  - ☐ Natural gas

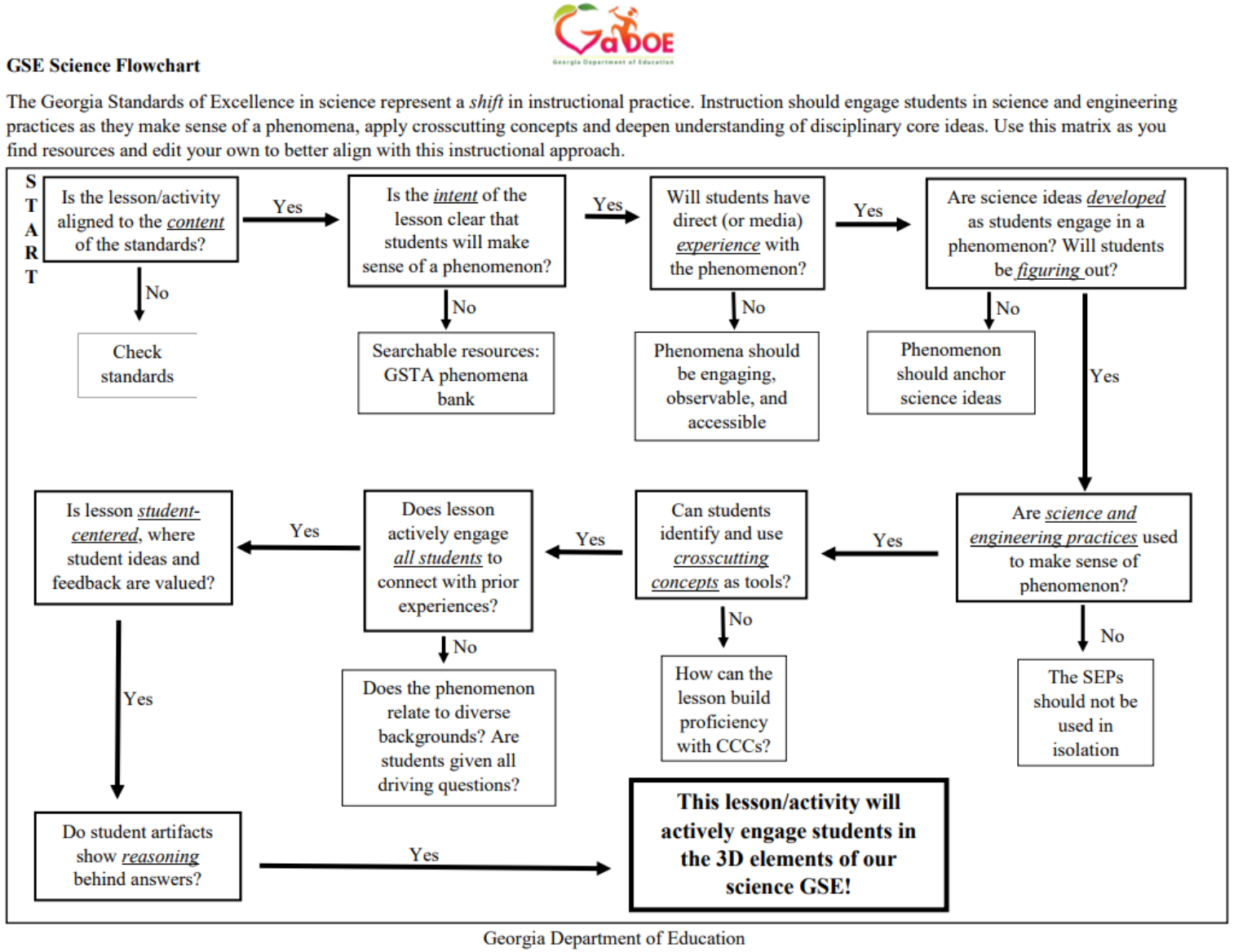
☐ *Design and evaluate* solutions for sustaining the quality and supply of natural resources such as:
- ☐ Air
- ☐ Soil
- ☐ Water

☐ *Construct an argument evaluating* contributions to the rise in global temperatures over the past century.
- ☐ Sources of evidence:
  - ☐ Tables
  - ☐ Graphs
  - ☐ Maps of global temperatures
  - ☐ Maps of regional temperatures
  - ☐ Atmospheric levels of greenhouse gasses
  - ☐ Carbon dioxide
  - ☐ Methane

The crosscutting concept is cause and effect

Georgia Department of Education

GSE Science Flowchart



SEP and CCC Support

Supporting Science and Engineering Practices 6-12

Science and engineering practices that span all science courses K-12. This document contains a short explanation of each SEP and ideas that can be used to support students when using each SEP in the science classroom. Students need supports to allow them to be successful in interacting with the science content. This document is designed to provide suggestions for how students can interact with the science and engineering practices. This document also provides support suggestions to assist students as they interact with the SEPs.

Tips for engaging students with the practices

- Start every lesson with a phenomenon that students can "figure out" as they work though the lesson
- Include a science and engineering practice in every lesson to assist students in "figuring out" a phenomena
- Create a classroom culture of "figuring out" where students are able to obtain, evaluate, and communicate information to explain a phenomena
- Be sure that students are able to work through the entire obtain, evaluate, and communicate cycle
- Ask students to use evidence to support their thinking. One way to do this is to ask students to justify their thinking.

Science and engineering practices (SEP)	A few options for interacting with SEPs	Support suggestions to be used as needed

Ask Questions and Define Problems
Ask questions about natural phenomena. Students instinctively have questions, and this practice is about harnessing those questions to help students explain the world around them.
	• Have students ask:
	  ○ Verbal questions
	  ○ Written question
	• Have students observe different phenomena and use that to formulate questions that can be used to obtain information
	• Have students use questions to identify information needed to obtain additional information
	• Provide students with a list of questions and have students choose the scientific questions that will help obtain information about a phenomenon
		• Provide students with question stems
		• Ensure that students have time to think
		• Observe images, videos, and/or demonstrations
		• Provide students with graphic organizers
		• The teacher should consider Charting/recording questions somewhere students can see
		• The teacher should model writing scientific questions
		• The teacher should consider having students revise a non-scientific question to be a

SEP Support Document

Supporting Cross-cutting Concepts 6-12

The cross-cutting concepts span all science courses K-12. This document contains a short explanation of each cross-cutting concept and ideas that can be used to support students when building knowledge around each CCC in the science classroom. Students may need a support to allow them to be successful in interacting with the science content and the cross-cutting concepts are one part of providing that support to students. This document is designed to provide suggestions for how students can interact with the science and engineering practices. This document also provides support suggestions to assist students as they interact with the CCCs.

Tips for including the Cross-cutting Concepts

- Start every lesson with a phenomenon that students can "figure out" as they work though the lesson
- Include a science and engineering practice in every lesson to assist students in "figuring out" a phenomena
- The crosscutting are designed to assist students in organizing information. It is essential that students be aware of the cross-cutting concept so that it becomes part of their toolkit when examining any science concept.
- Include the cross-cutting concept within the lesson as a lens that students are viewing the material through.
- Always use the cross-cutting concepts in context with a science and engineering practice and a disciplinary core idea.
- The cross-cutting concepts should be used to deepen student understanding of the disciplinary core ideas.
- Obtain, evaluate, and communicate will easily align with all of the cross-cutting concepts.

Patterns

Cross-cutting concept	Prompts to elicit student thinking about various phenomena	Science and engineering practices that most easily align
Patterns Observed repeated similarities in the world around us. This cross-cutting concept can be used to organize the information about the world and universe around us.	• What relationships did you notice in your observations? • What patterns did you notice in the material that you were observing? • What do the relationships or patterns that you noticed mean for the science concept that the lesson is focused on? • Do you expect this pattern to be stable over time?	• Analyzing and interpreting data • Mathematical and computational thinking **Sentence Frames for Student Use** • The pattern that I noticed is _____ because _____. • If the pattern continues then _____ _____.

CCC Support Document

SEP and CCC Support

Supporting Science and Engineering Practices K-5

Science and engineering practices that span all science courses K-12. This document contains an explanation of each SEP and ideas that can be used to support students when using each SEP in the science classroom. Students need supports to allow them to be successful in interacting with the science content. This document is designed to provide suggestions for how students can interact with the science and engineering practices. This document also provides support suggestions to assist students as they interact with the SEPs.

Tips for engaging students with the practices

- Use a phenomenon that students can observe and "figure out" as they work through the lesson
- Include a science and engineering practice in every lesson to assist students in "figuring out" a phenomena
- Create a classroom culture of "figuring out" where students can obtain, evaluate, and communicate information to explain a phenomena
- Be sure that students can work through the entire obtain, evaluate, and communicate cycle
- Ask students to use evidence to support their thinking. One way to do this is to ask students to justify their thinking.

Science and engineering practices (SEP)	A few options for interacting with SEPs	Support suggestions to be used as needed
Ask Questions and Define Problems Questions are the engine that drives science and engineering. Students ask questions about natural phenomena or define a problem. These questions can be testable questions (require investigation, data collection, and data analysis) or researchable questions (facts, have one answer, answers from a book, video, or on reputable website.) Students instinctively have questions, and this practice is about harnessing those questions to help students explain the world around them and define a problem.	• Identify a question from other types of statements • Have students identify and/or ask scientific questions in writing or verbally. • Use phenomena to formulate questions that can be used to obtain information • Provide students with a list of questions and have students choose the scientific (testable) and researchable (non-testable) questions that will help obtain information about a phenomena • Provide opportunities for students to collaborate on asking, writing, and/or revising questions	• Provide students with graphic organizers • Chart or record questions somewhere students can see throughout the lesson or unit • Model asking scientific questions • Model revising a non-scientific question to be a scientific question • Provide students with time to think before they respond. • Provide question stems or fill in the blank questions. • Provide examples and nonexamples of scientific questions.

SEP Support K-5

Supporting Crosscutting Concepts K-5

The crosscutting concepts (CCC) span all science courses K-12. This document contains a short explanation of each crosscutting concept and ideas that can be used to support students when building knowledge around each CCC in the science classroom. Students may need support to allow them to be successful in interacting with the science content and the crosscutting concepts are one part of providing that support to students. This document is designed to provide suggestions for how students can interact with the science and engineering practices. This document also provides support suggestions to assist students as they interact with the CCCs.

Tips for including the Crosscutting Concepts

- Start every lesson with a phenomenon that students can "figure out" as they work though the lesson
- Include a science and engineering practice in every lesson to assist students in "figuring out" a phenomena
- The crosscutting concepts are designed to assist students in organizing information. It is essential that students be aware of the crosscutting concept so that it becomes part of their toolkit when examining any science concept.
- Include the crosscutting concept within the lesson as a lens that students are viewing the material through.
- Always use the crosscutting concepts in context with a science and engineering practice and a disciplinary core idea.
- The crosscutting concepts should be used to deepen student understanding of the disciplinary core ideas.
- Obtain, evaluate, and communicate will easily align with all the crosscutting concepts.

Patterns

Crosscutting concept	Prompts to elicit student thinking about various phenomena	Science and engineering practices that most easily align
Patterns Observed repeated similarities in the natural and designer world around us. This crosscutting concept can be used to classify information about the world and universe around us, ask questions about the relationships and causes of phenomena.	• What patterns did you notice? • Can you describe the pattern? • What predictions can you make based on the pattern? • What is the same? What is different? • What comes next? Does it repeat? • H or	• Analyzing and interpreting data • Mathematical and computational thinking **Sentence Frames for Student Use** • The pattern that I noticed is _____. • From the pattern_____ I predict_____ because_____

CCC Support K-5

In Depth Look into the SEP and CCC

Science and Engineering Practices

A Science Framework for K-12 Science Education provides the blueprint for developing the Georgia Standards of Excellence for Science. The *Framework* expresses a vision in science education that requires students to operate at the nexus of three dimensions of learning: Science and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas. The *Framework* identified a small number of disciplinary core ideas that all students should learn with increasing depth and sophistication, from Kindergarten through grade twelve. Key to the vision expressed in the *Framework* is for students to learn these disciplinary core ideas in the context of science and engineering practices. The importance of combining science and engineering practices and disciplinary core ideas is stated in the *Framework* as follows:

> *Standards and performance expectations that are aligned to the framework must take into account that students cannot fully understand scientific and engineering ideas without engaging in the practices of inquiry and the discourses by which such ideas are developed and refined. At the same time, they cannot learn or show competence in practices except in the context of specific content.* (NRC *Framework*, 2012, p. 218)

The *Framework* specifies that each performance expectation must combine a relevant practice of science or engineering, with a core disciplinary idea and crosscutting concept, appropriate for students of the designated grade level. In the future, science assessments will not assess students' understanding of core ideas separately from their abilities to use the practices of science and engineering. They will be assessed together, showing students not only "know" science concepts; but also, students can use their understanding to investigate the natural world through the practices of science inquiry, or solve meaningful problems through the practices of engineering design. The *Framework* uses the term "practices," rather than "science processes" or "inquiry" skills for a specific reason:

> *We use the term "practices" instead of a term such as "skills" to emphasize that engaging in scientific investigation requires not only skill but also knowledge that is specific to each practice.* (NRC *Framework*, 2012, p. 30)

The eight practices of science and engineering that the *Framework* identifies as essential for all students to learn and describes in detail are listed below:

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

- Take a deeper look into the SEPs and CCCs
- SEP
- CCC

Crosscutting Concepts

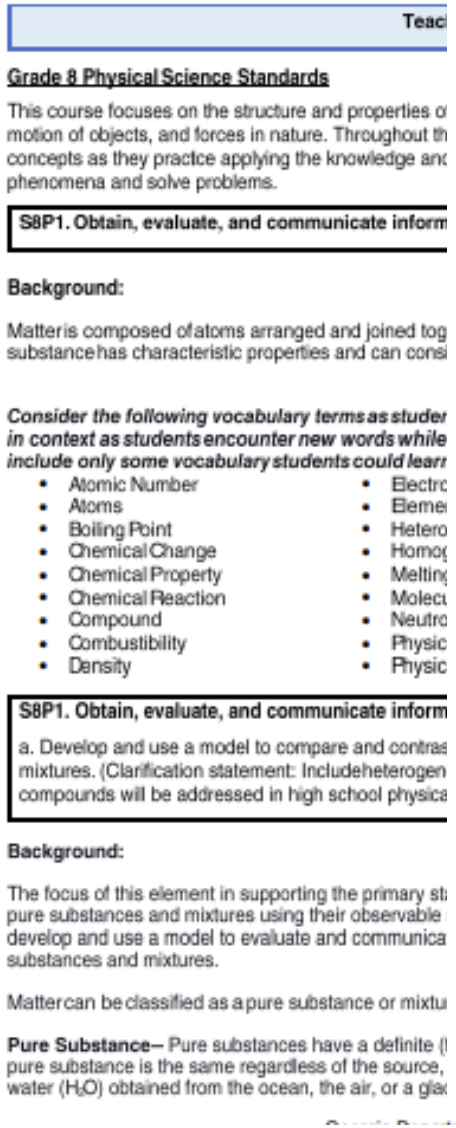
> *Crosscutting concepts have value because they provide students with connections and intellectual tools that are related across the differing areas of disciplinary content and can enrich their application of practices and their understanding of core ideas. — Framework p. 233*

A Framework for K-12 Science Education: Practices, Core Ideas, and Crosscutting Concepts (Framework) recommends science education in grades K-12 be built around three major dimensions: scientific and engineering practices; crosscutting concepts that unify the study of science and engineering through their common application across fields; and core ideas in the major disciplines of natural science. The purpose of this appendix is to describe the second dimension—crosscutting concepts—and to explain its role in the GSE for Science.

The Framework identifies seven crosscutting concepts that bridge disciplinary boundaries, uniting core ideas throughout the fields of science and engineering. Their purpose is to help students deepen their understanding of the disciplinary core ideas (pp. 2 and 8) and develop a coherent and scientifically based view of the world (p. 83.) The seven crosscutting concepts presented in Chapter 4 of the Framework are as follows:

1. *Patterns.* Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.
2. *Cause and effect:* Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.
3. *Scale, proportion, and quantity.* In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.
4. *Systems and system models.* Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.
5. *Energy and matter: Flows, cycles, and conservation*. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations.
6. *Structure and function.* The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.
7. *Stability and change.* For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.

Teacher Notes:



Teac

Grade 8 Physical Science Standards

This course focuses on the structure and properties o
motion of objects, and forces in nature. Throughout th
concepts as they practce applying the knowledge anc
phenomena and solve problems.

S8P1. Obtain, evaluate, and communicate inform

Background:

Matter is composed of atoms arranged and joined tog
substance has characteristic properties and can consi

***Consider the following vocabulary terms as studer
in context as students encounter new words while
include only some vocabulary students could learr***

- Atomic Number
- Atoms
- Boiling Point
- Chemical Change
- Chemical Property
- Chemical Reaction
- Compound
- Combustibility
- Density
- Electro
- Eleme
- Hetero
- Homog
- Melting
- Molecu
- Neutro
- Physic
- Physic

S8P1. Obtain, evaluate, and communicate inform

a. Develop and use a model to compare and contras
mixtures. (Clarification statement: Include heterogen
compounds will be addressed in high school physica

Background:

The focus of this element in supporting the primary st
pure substances and mixtures using their observable
develop and use a model to evaluate and communica
substances and mixtures.

Matter can be classified as a pure substance or mixtu

Pure Substance– Pure substances have a definite (
pure substance is the same regardless of the source,
water (H_2O) obtained from the ocean, the air, or a gla

and one atom of oxygen (O). Likewise, a sample of p
Therefore, elements and compounds are pure subst

- **Elements –** An element is a pure substance c
  Each atom of a single element has the same
  element whose atoms all contain eight proton
  contain one proton in the nucleus. Oxygen an
- **Compounds –** A compound is a pure substar
  joined together in a fixed ratio. Different samp
  properties. However, a compound's properties
  Therefore, different compounds of the same e
  properties. A chemical reaction can separate

Mixtures – A mixture comprises two or more substar
can be elements and compounds not chemically join
depending on its source or the type and amount of e
mixture may have different compositions. For exampl
samples of each of these mixtures may have differen

- Soil is a mixture of organic material and weat
  significantly depending on the location (sourc
  weathered rock present.
- Air comprises oxygen, nitrogen, carbon dioxid
  of air can vary based on location.
- Depending on location, ocean water can vary
  saltier than others.

A mixture can be homogeneous or heterogeneous ba

- **Homogeneous** mixtures are uniform, meanin
  characteristics are the same throughout the n
  mixture. For example, brass, steel, soda, and
- **Heterogeneous** mixtures are not uniform, me
  characteristics may vary—different parts of th
  However, the components of a heterogeneou
  distinguishable from one another. For exampl
  are heterogeneous mixtures.

*Teacher Note: Students do not need to examine or c
compounds. (Source: Frequently Asked Questions-S*

Potential Initial Student Ideas:

- Elements and compounds are the same thing
- Compounds and mixtures are the same.

Science and Engineering Practice: This element's
models.

Students will obtain and evaluate information about th
and compounds) and mixtures (homogeneous and h
these matter classifications by observing various sam
structure, and properties among the known samples.

information about pure substances and mixtures. Students should use models designed to compare and contrast the structure and properties of pure substances and mixtures. Models should include observable properties.

Crosscutting Concepts: Patterns; Structure and Function

Phenomenon Examples:

- A vinegar and baking soda mixture.
- Why do we call it 14-karat gold?

S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.

b. Develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed.

Background:

This standard's element focuses on the structure and properties of matter related to the states of matter and how energy changes affect the movement of particles in matter.

Particles of matter are in motion. Thermal energy is the form of energy associated with the random motion of particles. Thermal energy measures the total internal energy in an object or system resulting from its random particle motion. When thermal energy transfers to and from matter, the structure of the matter (i.e., the movement of its particles and the space between them) changes. Transferring energy into a system of matter causes the particles that make up the matter to increase in motion, while transferring energy out of a system causes the particle motion to decrease. Models depicting the particles (atoms or molecules) in the system often represent this cause-and-effect relationship between energy and the movement of matter.

Matter can have different physical forms or phases (states) depending on the amount of thermal energy. This physical property is related to the structure of the particles (i.e., their movement and locations relative to one another). There are four phases of matter—solid, liquid, gas, and plasma. Each has a different structure.

In the solid phase, atoms or molecules are closely spaced, in constant contact, and limited in motion. Still, they may vibrate in place and a fixed position, unable to move past or around one another due to the forces holding them together. The forces of attraction and repulsion between the atoms or molecules act like springs, pushing and pulling on one another, causing them to vibrate in place.

In the liquid phase, atoms or molecules are close and in constant contact, held by the forces between them. As a result, the particles are free to change positions and move around or slide past one another at various speeds.

In the gas phase, widely spaced atoms or molecules move freely and disorderly at high speeds and sometimes collide and bounce off one another or the walls of their container. The forces between the particles cause them to change their path when colliding, resulting in disorderly motion.

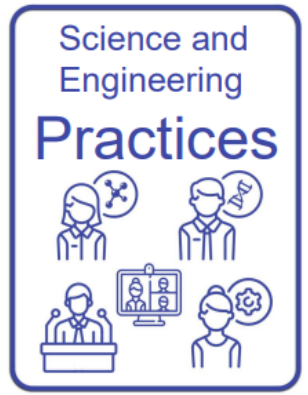
In the plasma phase, the atoms are widely spaced, move at extremely high speeds in a disorderly manner, and have become electrically charged. The increased energy of the particles causes them to lose electrons resulting in an electrically charged gas. This phase has exceptionally high temperatures, such as observations in stars like our sun.

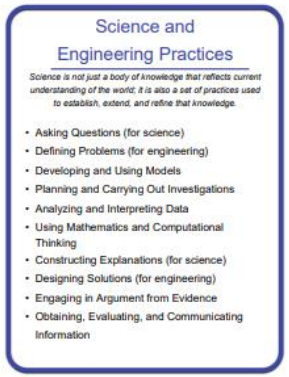
K-8th grades, Physics, Biology, Physical Science

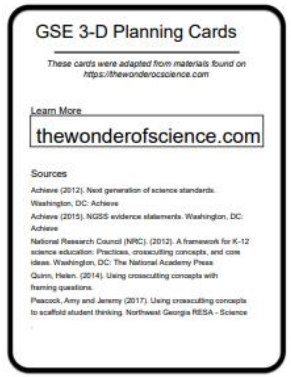
- Chemistry
- Environmental Science

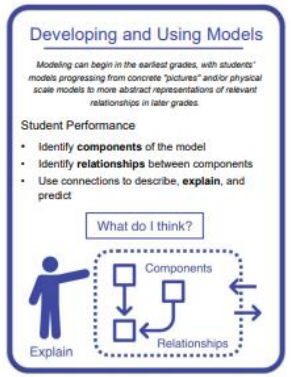
GSE Planning Cards

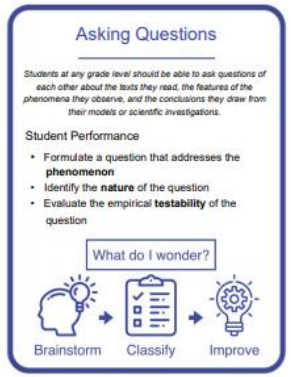
- Science and Engineering Practices
- Crosscutting Concepts
- [Planning cards]







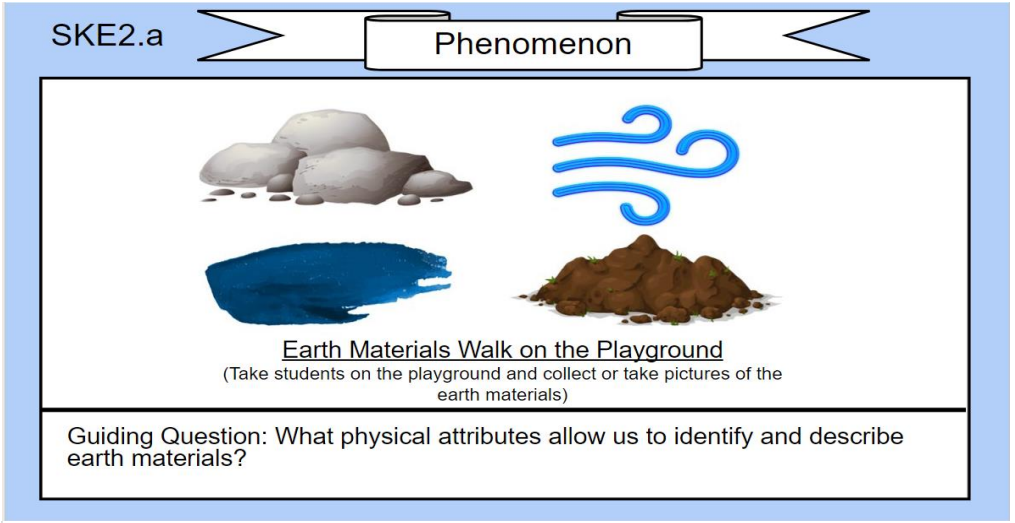


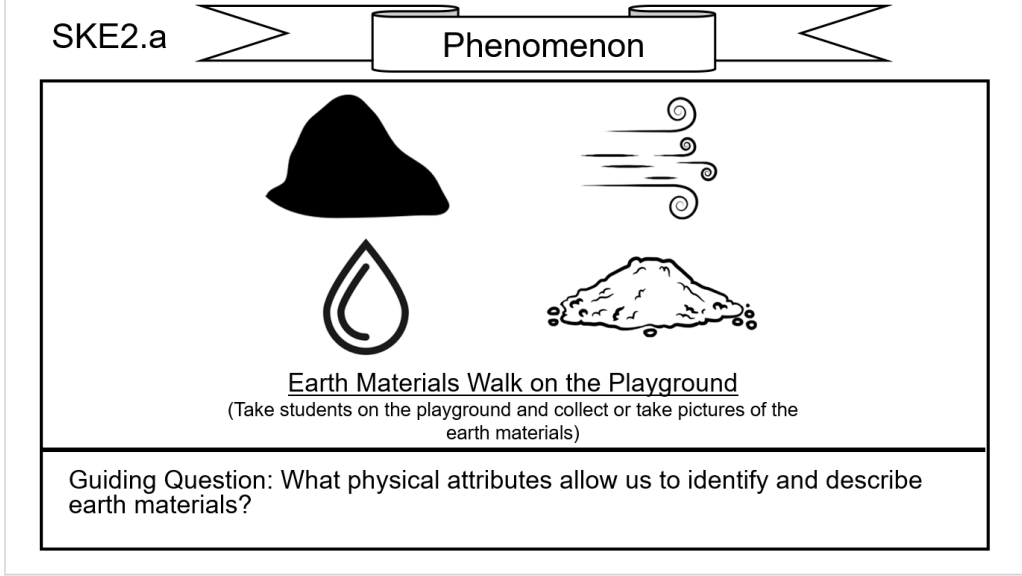


Grab and Go Phenomena Cards

- Ideas for phenomena based on standard and element
  - Color Version
  - Printable Version
  - Editable Version
  - Grades K-3

Grades 4-5





Grab and Go Phenomena Cards

- Ideas for phenomena based on standard and element
- Available for:
  - 6-8 grades
  - Biology
  - Chemistry
  - Earth Systems
  - Environmental Science
  - Physical Science
  - Physics
- Grab and Go Phenomena Cards

Grab and Go Phenomena Cards: 6th Grade

S6E1a. Ask questions to determine changes in models of Earth's position in the solar system, and origins of the universe as evidence that scientific theories change with the addition of new information. (Clarification statement: Students should consider Earth's position in geocentric and heliocentric models and the Big Bang as it describes the formation of the universe.) • Celestial objects from different perspectives • What information led to heliocentric model?	**S6E1b. Develop a model to represent the position of the solar system in the Milky Way galaxy and in the known universe.** • The "Goldilocks Zone" of solar systems • How to measure distance in space
S6E1c. Analyze and interpret data to compare and contrast the planets in our solar system in terms of: **• size relative to Earth,** **• surface and atmospheric features,** **• relative distance from the sun, and** **• ability to support life.** • Exoplanets • Why is Pluto no longer considered a planet? • Could we live on Mars?	**S6E1d. Develop and use a model to explain the interaction of gravity and inertia that governs the motion of objects in the solar system.** • Orbit patterns and temperature • Finding Earth-like planets • Planet motion simulations • GPS satellites
S6E1e. Ask questions to compare and contrast the characteristics, composition, and location of comets, asteroids, and meteoroids. • Asteroid impact and extinction events	**S6E2a. Develop and use a model to demonstrate the phases of the moon by showing the relative positions of the sun, Earth, and moon.** • Why do moon phases occur? • How can the moon be orange at times? • The moon visible during the day

GPB and GaDOE Partnership

Georgia Home Classroom

Let's Learn Georgia

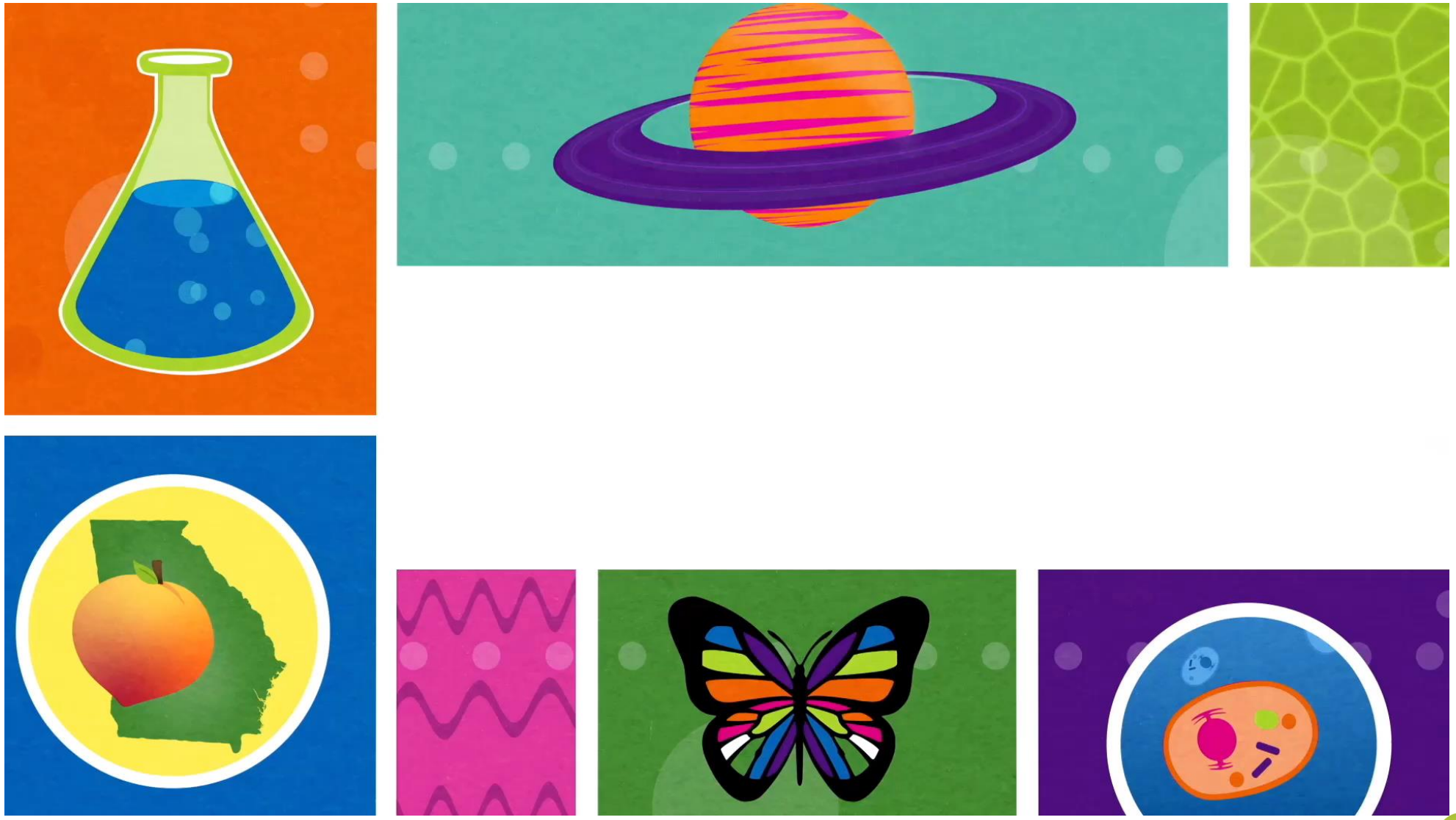
K-12 Digital Learning Plans

Getting Ready Guides for Kindergarten to Middle School

Classroom Conversations Podcast

School Stories

GPB and GaDOE Partnership – Science in Action



GPB High School Science

[Let's Go Enviro | Georgia Public Broadcasting (gpb.org)]

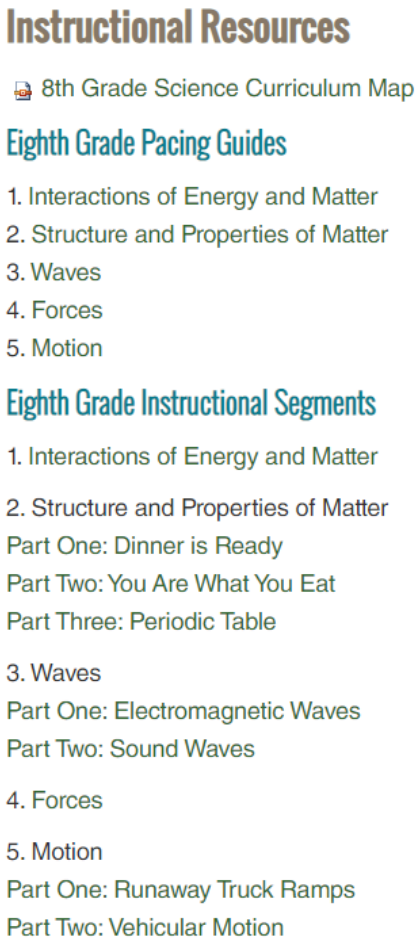
[Physics in Motion | Georgia Public Broadcasting (gpb.org)]

[Chemistry Matters | Georgia Public Broadcasting (gpb.org)]

Instructional Resources

Instructional Resources

- Curriculum map
- Pacing guides
- Teacher Notes
- Instructional segments
  - 5E format
  - 3-dimensional format
  - Phenomena driven
  - Contains supports suggestions for all learners



Instructional Resources

8th Grade Science Curriculum Map

Eighth Grade Pacing Guides

1. Interactions of Energy and Matter
2. Structure and Properties of Matter
3. Waves
4. Forces
5. Motion

Eighth Grade Instructional Segments

1. Interactions of Energy and Matter

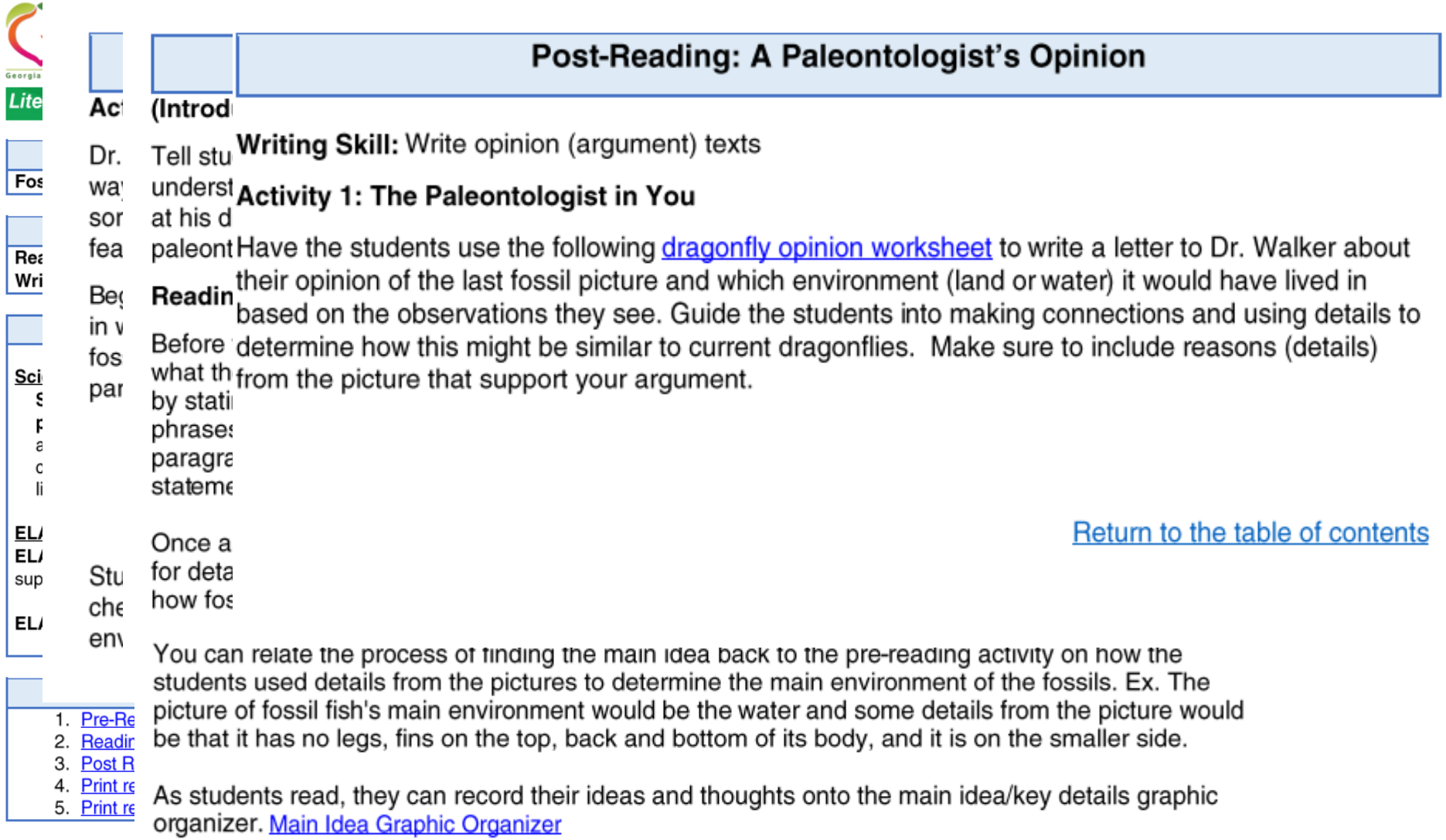
2. Structure and Properties of Matter
Part One: Dinner is Ready
Part Two: You Are What You Eat
Part Three: Periodic Table

3. Waves
Part One: Electromagnetic Waves
Part Two: Sound Waves

4. Forces

5. Motion
Part One: Runaway Truck Ramps
Part Two: Vehicular Motion

Literacy-Based Science Tasks



Post-Reading: A Paleontologist's Opinion

Writing Skill: Write opinion (argument) texts

Activity 1: The Paleontologist in You

Have the students use the following dragonfly opinion worksheet to write a letter to Dr. Walker about their opinion of the last fossil picture and which environment (land or water) it would have lived in based on the observations they see. Guide the students into making connections and using details to determine how this might be similar to current dragonflies. Make sure to include reasons (details) from the picture that support your argument.

Return to the table of contents

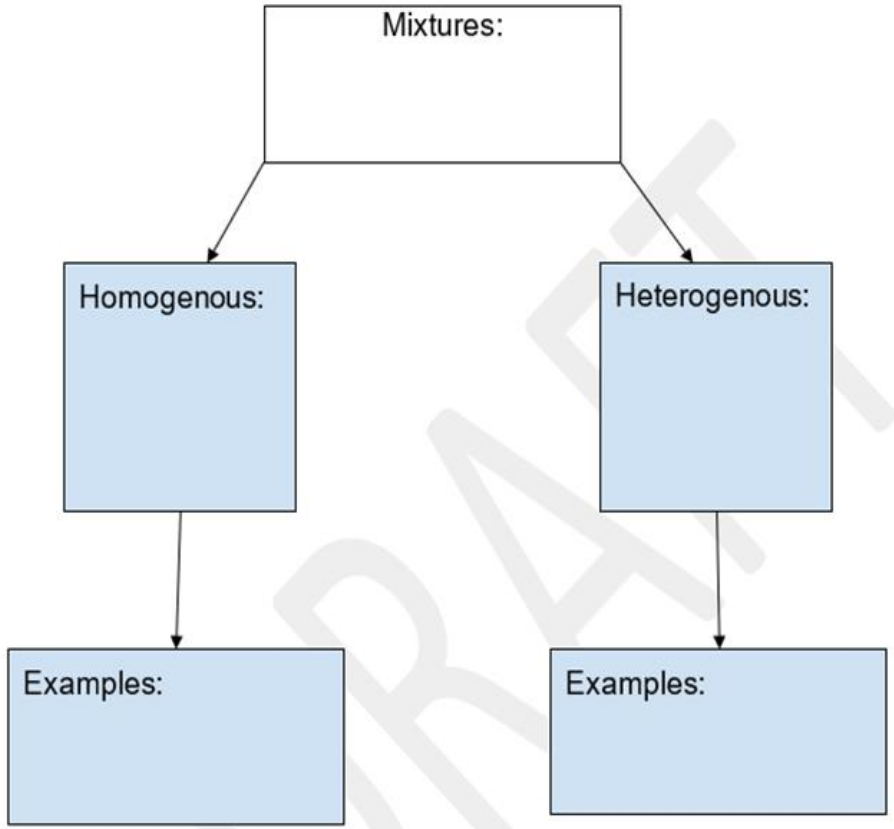
You can relate the process of finding the main idea back to the pre-reading activity on how the students used details from the pictures to determine the main environment of the fossils. Ex. The picture of fossil fish's main environment would be the water and some details from the picture would be that it has no legs, fins on the top, back and bottom of its body, and it is on the smaller side.

As students read, they can record their ideas and thoughts onto the main idea/key details graphic organizer. Main Idea Graphic Organizer

Literacy-Based Science Tasks

Mixtures

As you read, use the boxes to write down the characteristics and examples of the types of mixtures.



Writi

Activ

After
chara
objec
the li

Activ

Stud
heter
a par

Help
argu
hom
lotion

Object Sort

Group 1	Group 2

Why did you put the objects in each group?

Give each group a name or title.

Group 1: _____

Group 2: _____

Current Literacy-Based Science Tasks

Kindergarten- Day and Night Sky, Sink and Float, Living or Nonliving, Soil

1st Grade- Light, Magnets, Needs of Plants and Animals, Weather

2nd Grade- Shadows, Structures

3rd Grade- Fossils, Water Pollution

4th Grade- Ecosystems, Energy Flow

5th Grade- Erosion

6th Grade- Tornadoes

7th Grade- Cells

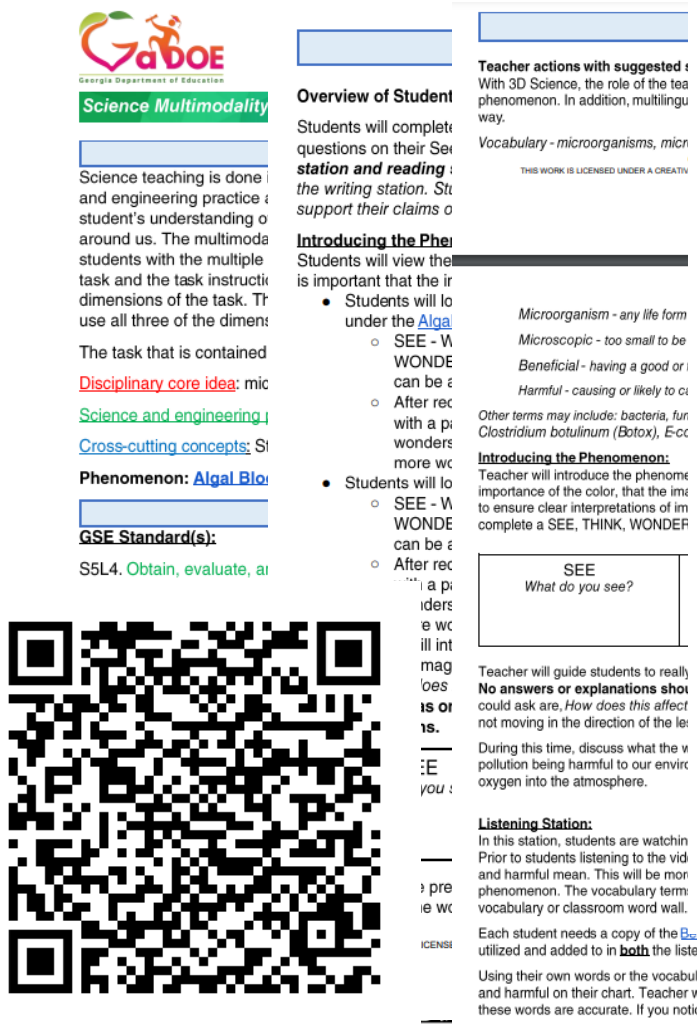
8th Grade- Mixtures

More Literacy-Based Science Tasks Coming Soon!

Multimodality Tasks

The multimodality stations science tasks are content-language integrated lessons that emphasizes different modes of communication through the WIDA English Language Development Standards and Science Standards.

Each task is designed with five stations; **Introducing the Phenomenon**, and then the **Listening**, **Reading, Speaking**, and **Writing Stations**. In addition, each task has a student action section and a teacher action section.


Science Multimodality

Overview of Student

Students will complete

Science teaching is done

and engineering practice

student's understanding o

around us. The multimoda

students with the multiple

task and the task instructi

dimensions of the task. Th

use all three of the dimens

The task that is contained

Disciplinary core idea: mic

Science and engineering

Cross-cutting concepts: St

Phenomenon: Algal Bloo

GSE Standard(s):

S5L4. Obtain, evaluate, a

Introducing the Phe

Students will view the

is important that the ir

- Students will lo under the Algal
  - SEE - W WONDE can be a
  - After rec with a pa wonders more wo
- Students will lo
  - SEE - W WONDE can be a
  - After rec

Teacher actions with suggested

With 3D Science, the role of the tea

phenomenon. In addition, multilingu

way.

Vocabulary - microorganisms, micr

THIS WORK IS LICENSED UNDER A CREATIV

Microorganism - any life form

Microscopic - too small to be

Beneficial - having a good or

Harmful - causing or likely to c

Other terms may include: bacteria, fu

Clostridium botulinum (Botox), E-co

Introducing the Phenomenon:

Teacher will introduce the phenome

importance of the color, that the ima

to ensure clear interpretations of im

complete a SEE, THINK, WONDER

SEE

What do you see?

Teacher will guide students to really

No answers or explanations shou

could ask are, How does this affect

not moving in the direction of the le

During this time, discuss what the

pollution being harmful to our enviro

oxygen into the atmosphere.

Listening Station:

In this station, students are watchin

Prior to students listening to the vid

and harmful mean. This will be mor

phenomenon. The vocabulary term

vocabulary or classroom word wall.

Each student needs a copy of the Beneficial and Harmful Microorganisms Chart. This chart will be utilized and added to in both the listening and reading stations.

Using their own words or the vocabulary wall, students will write the meaning of the words beneficial and harmful on their chart. Teacher will circulate and check in to make sure the understanding of these words are accurate. If you notice a student needs extra guidance, then stop at the student's

After seeing the phenomena what do you see, think and wonder about what you observed. Complete the chart below with observations, thoughts, and questions.

SEE *What do you see?*	THINK *What do you think is happening?*	WONDER *What do these images/videos make you wonder? What questions do you have that can be explained with science?*

Georgia Department of Education

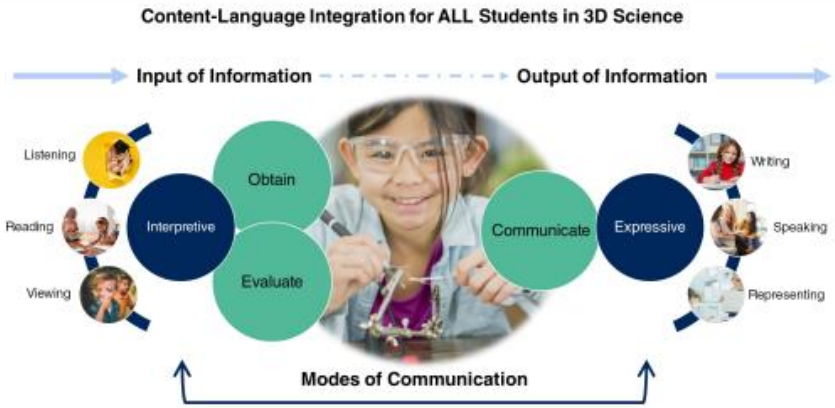
THIS WORK IS LICENSED UNDER A CREATIVE COMMONS ATTRIBUTION - NONCOMMERCIAL - SHAREALIKE 4.0 INTERNATIONAL LICENSE

10.26.2022 Page 11 of 17

Multimodality Tasks

[GaDOE Science ESOL Resources Feb 2023]

Science/ESOL Resources



Science Multimodality Stations The multimodality stations leverage language development to deepen student understanding of science through listening, reading, speaking, and writing.

- Kindergarten Multimodality: Grouping Animals
- 2nd Grade Multimodality: Life Cycles
- 3rd Grade Multimodality: Animals and Plants
- 3rd Grade Multimodality: Pollution
- 4th Grade Multimodality: Energy
- 5th Grade Multimodality: Microorganisms
- 5th Grade Multimodality: Instincts and Learned Behaviors
- 5th Grade Multimodality: Cells
- 7th Grade Multimodality: Artificial Selection
- 7th Grade Multimodality: Cells
- 7th Grade Multimodality: Interdependence
- Biology Multimodality Station: Cells
- Biology Multimodality: Asexual Reproduction
- Biology Multimodality Station: Energy
- Biology Multimodality Station: Evidence for Evolution

Phenomena Tasks 3-5

3rd Grade

Sample Science Phenomena Task

Questions for formative assessment:

Crosscutting concept: patterns

Use evidence from your investigation to explain the patterns you observed when you scratched {mineral} on {test material}? Construct an explanation for how the hardness scale can help us understand the physical attributes of rocks and minerals.

- What does the hardness test tell you about minerals?
- How can that help you classify (and identify) different rocks and minerals?
- Why is this an important test for classification?

Next Steps:

Students ask questions and obtain information about classification of minerals according to their luster or texture. Use Venn diagrams to classify rocks based on physical attributes (color, texture, luster, hardness). Students could count the colors observed in rocks and sort them based on color.

phenomenon that will help students gain an understanding of all the dimensions of science learning.

Phenomena Tasks

- 7th Grade
- 8th Grade
- Biology
- Physics
- Environmental Science

Teacher Background:

Students will compare and contrast open and closed systems within mechanical energy. Students will define and develop models showing open and closed systems.

Student Performance Progression:

Individual Performance:

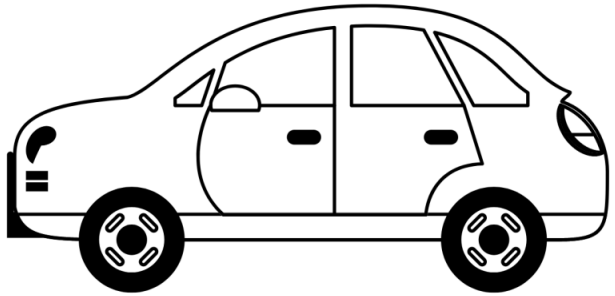
1. Obtain information by examining image 1 and image 2.
2. Ask questions about the similarities and differences in these images.

Group Performance:

3. Communicate which image is a closed system and which is an open system. Use evidence from the images to support the hypothesis.
4. Obtain information about open and closed systems in physics.
5. Communicate with other groups which system is open and which is closed and why.

Individual Performance:

6. Develop a model that communicates how the car accident is an open system.



Evidence of Student Success

Students should be able to define a closed system. Students should be able to define an open system. Students should be able to analyze an image and define conservation of energy within either the open or closed system.

Support Suggestions

In science, as students work to understand and explain phenomena, there are multiple opportunities to engage students in building knowledge. This phenomenon will allow students to show their knowledge of the disciplinary core idea, the science and engineering practice, and the crosscutting concept as part of a task. Students may need some support to assist them as they work. Some suggestions for supports are contained below:

- Consider providing multiple closed system examples.
- Consider providing multiple open systems.
- Consider randomizing the types of systems within one image or video.
- Consider combining free body diagrams with open and closed systems to connect concepts.
- Ensure there are clear expectations and guidelines for group work so that all students feel engaged and valued.
- Consider providing students (or helping them make one) with a graphic organizer for maintaining images and examples.

Formative Assessment Tasks

Evidence of Student Success

Students will need to pull knowledge from lessons about the atom and subatomic particles, isotopes and average atomic mass, and periodic law to work through this scenario of organizing the periodic table like an 1800s scientist.

Students will walk through calculating average atomic masses using different forms of isotopic data and using

Student Sheets

Scenario:

It is the 1860s and you are an apprentice scientist to Dmitrii Mendeleev Your job is to help Mendeleev organize the "zoo of elements" (the known elements of his time were unorganized and therefore just a chaotic list that many considered a zoo) at that time in a systematic way and then present your argument (reasoning) to the scientific community. Below are note cards containing the average atomic masses of some of the elements known at that time. *Please note, the average atomic masses are what we know them to be today, not what Mendeleev would have had due to differences in technology.*

Assessment Format:

Students are given the Scenario as well as Element Cards with data they will use to organize their own periodic table. It is suggested to make extra copies of the element cards so that students can cut them out and manipulate them.

Provide students with the Student Sheet to assist students in answering the questions, evaluating the information, and providing evidence to support their conclusions.

Then observe students working, assisting as need, to gather observational data about how students are progressing. Finally use the information available in the evidence of student success section to determine how successful students were on the overall task.

- 8th Grade
- High School Physical Science
- Chemistry
- Physics

Formative Assessment Choice Boards

Name: _____ **Date:** _____ **Class:** _____

Directions: Choose one box in row 1 to complete. Then choose 1 box in row 2 to complete. Then complete the final task.

	Option 1	Option 2	Option 3
Row 1	Use Newton's laws to describe why you need to wear a seatbelt when a car is in motion.	You notice that – in the last two days – your car has taken longer to accelerate to highway speeds. Prepare an explanation of a force-related factor that might cause this acceleration difference that you can give to your mechanic. Record yourself stating the explanation.	Describe three examples illustrating Newton's 3rd Law in your daily life. For each, identify the pair of forces, and relate their magnitudes and directions. Draw a Free Body Diagram showing the pair of forces for one your examples.

8th Grade
High School Physical Science
Chemistry
Physics

Final Task:

During a soccer game, two opposing players are running at a stopped ball and kick it from opposite directions at the same time. Use your understanding of Newton's Laws and the additional information provided below to analyze this scenario and respond to the prompts.

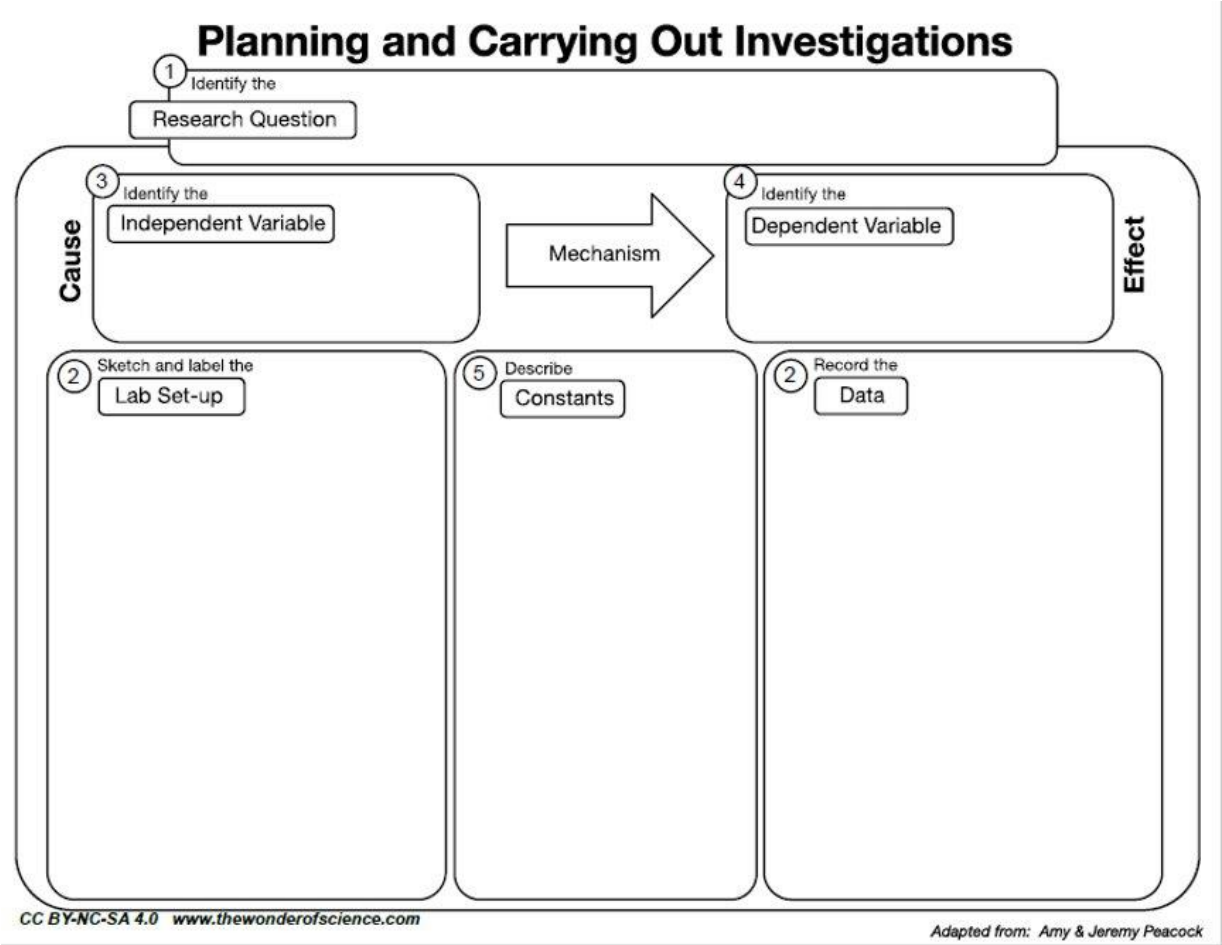
1. Explain and predict how the soccer ball will behave before and after the two players kick it 1) if they kick it with different amounts of force and 2) if they kick it with the same amount of force.
2. Player A kicks the 0.45-kg soccer ball with 2,218 N of force. Player B kicks the ball with 2,057 N of force. Calculate the ball's acceleration and describe the direction it will move.
3. Identify the forces that will act on Player A's foot as a result of this scenario. How much force will Player A's foot experience?
4. Explain and predict how the soccer ball will behave after the players kick it if it isn't acted on by any external forces.
5. Describe the natural external forces that will act on the ball after it's kicked, and predict how they will affect the ball's acceleration.

Frameworks- Newest additions

- Frameworks
  - Curriculum maps
  - Instructions segments
  - Pacing Guides
- Additional HS courses
  - Human Anatomy and Physiology
  - Forensics

- Zoology
- Oceanography

Graphic Organizers



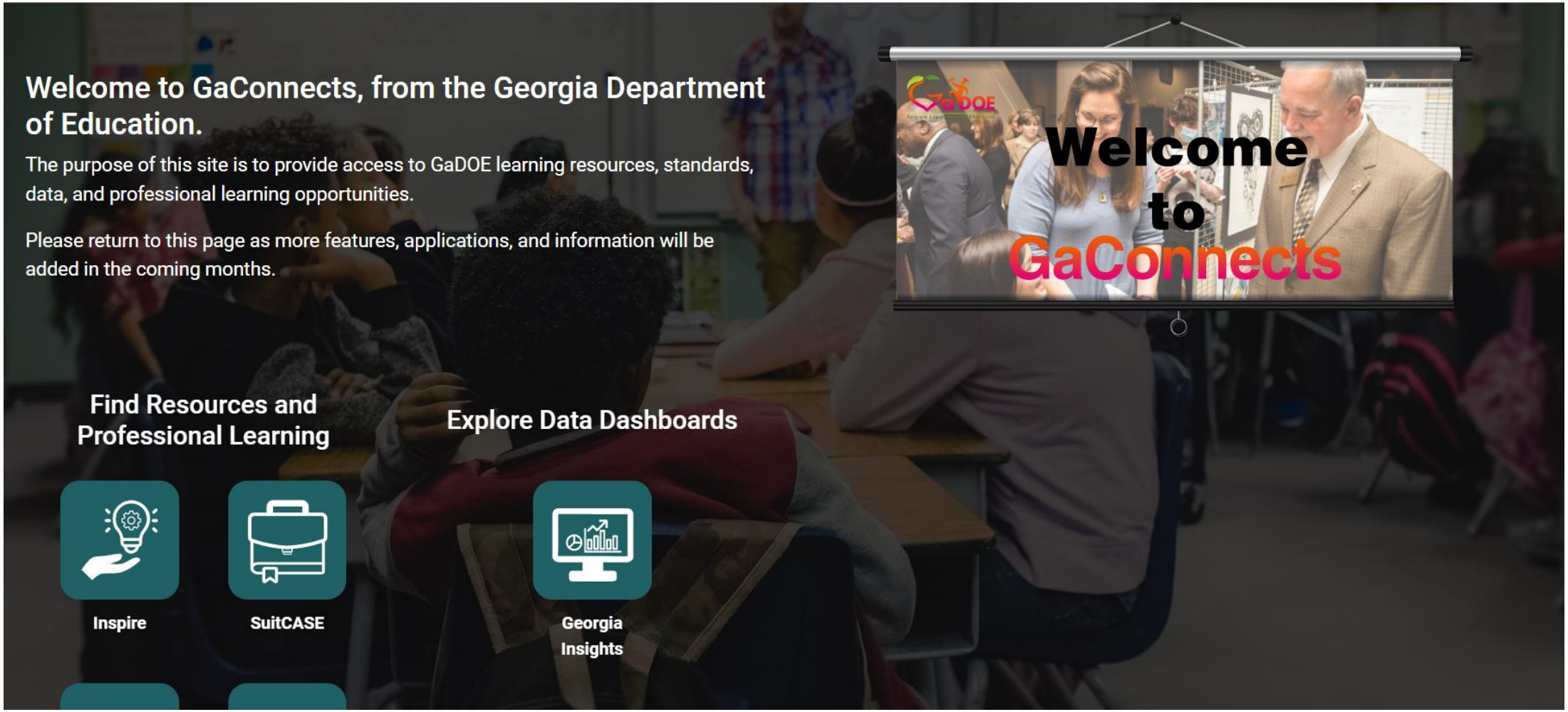
Graphic Organizers for K-5!

- Graphic Organizers

Where to Find Resources

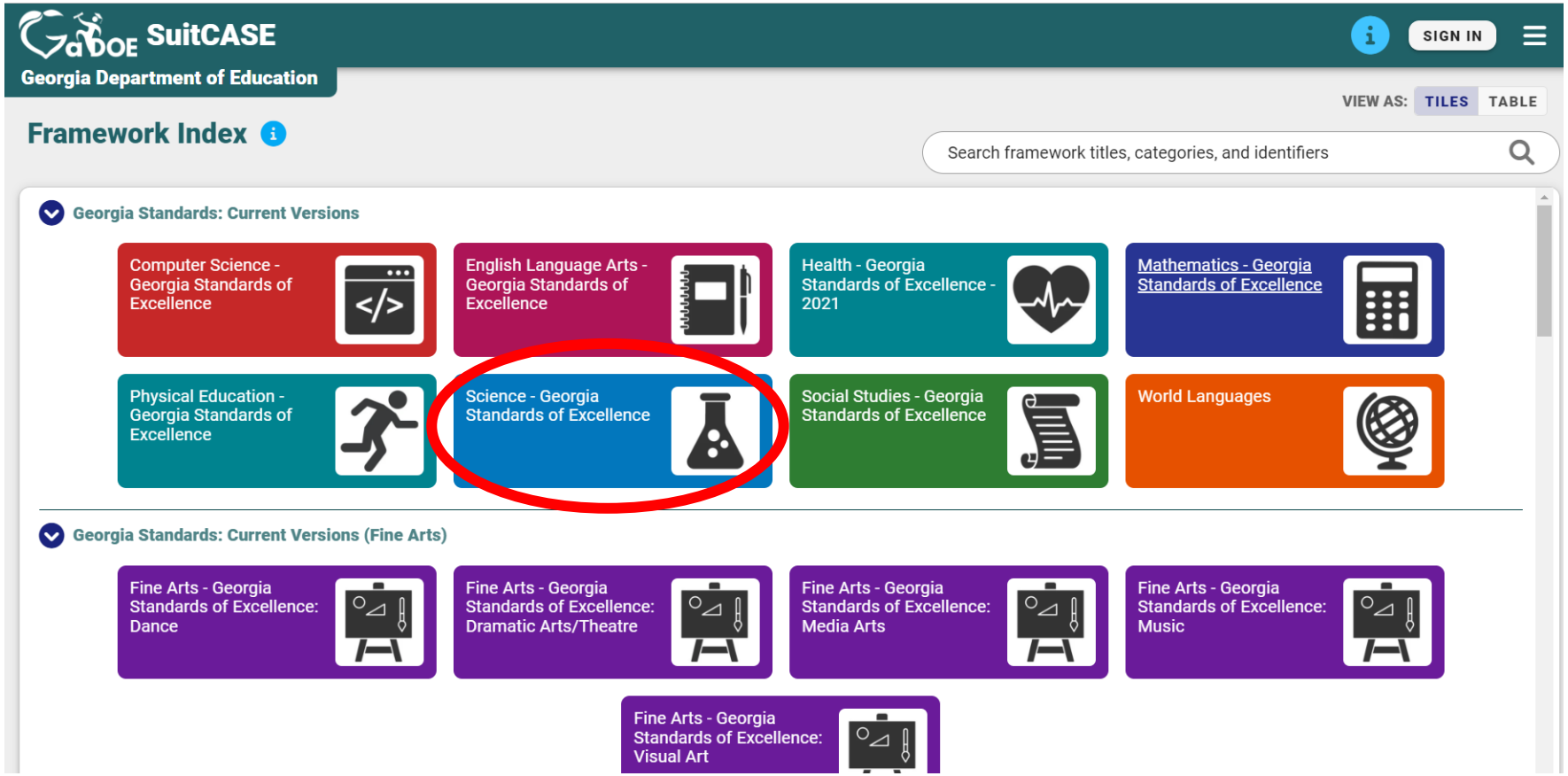
GaConnects

Sign In | Alternative View

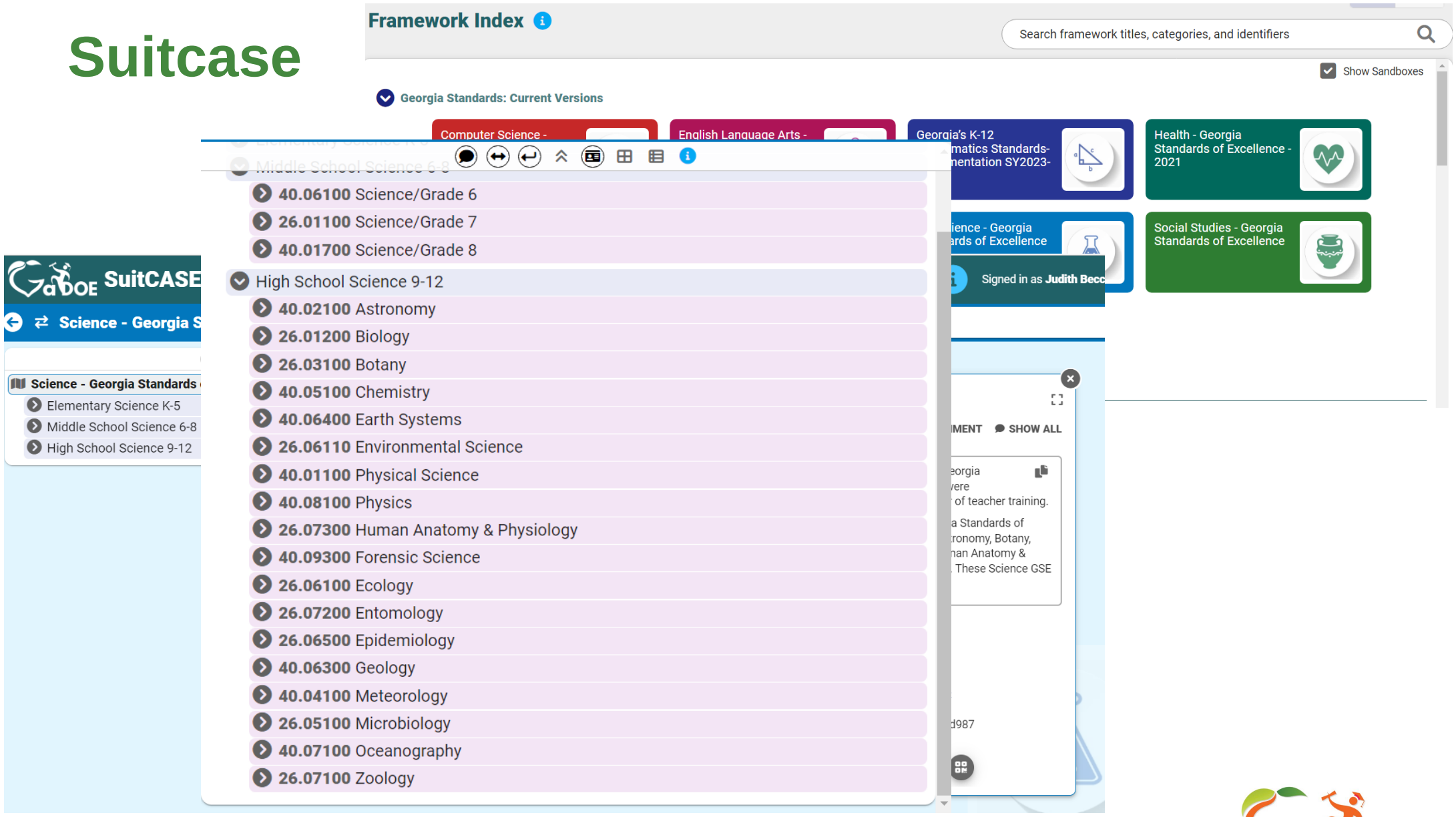


https://gaconnects.gadoe.org/

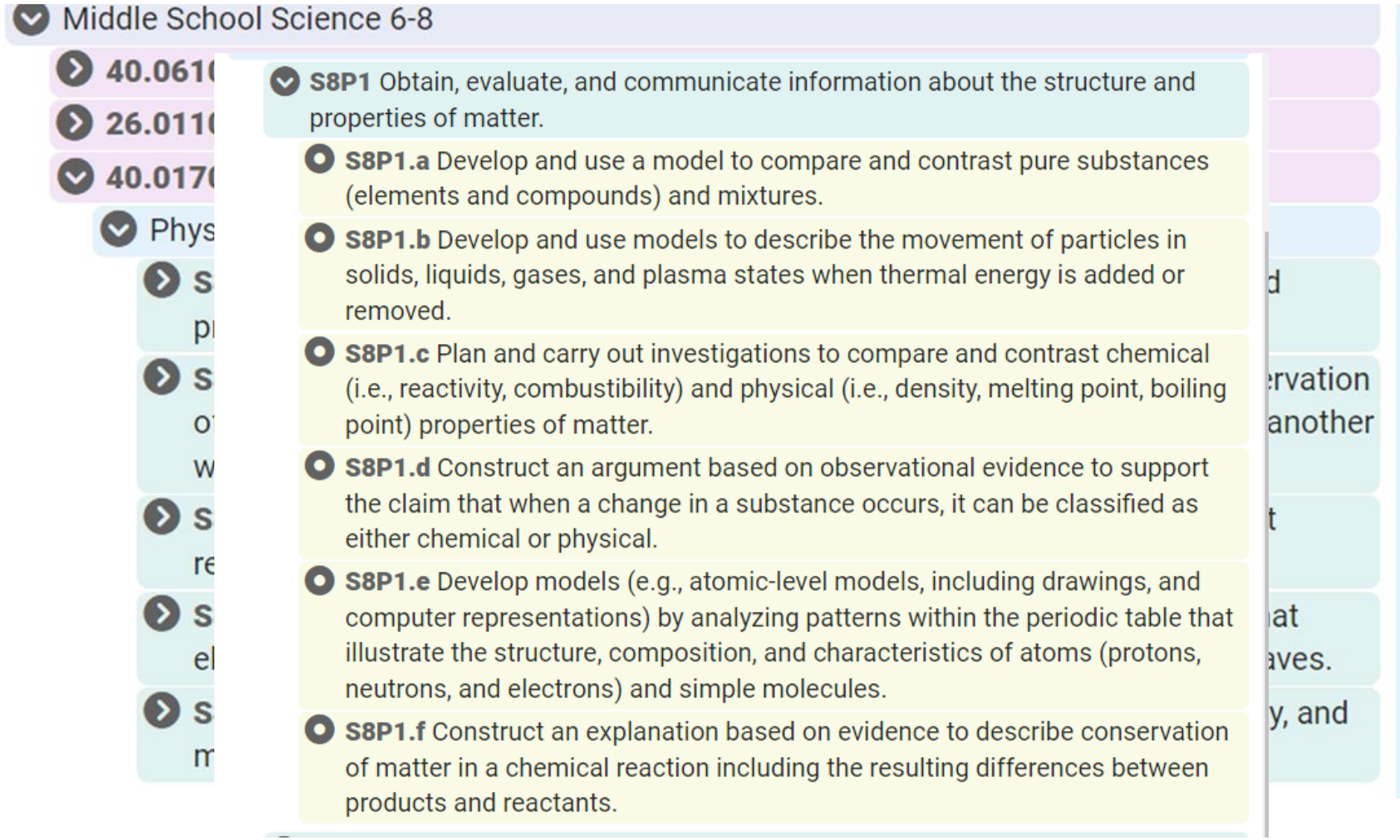
GaDOE Suitcase



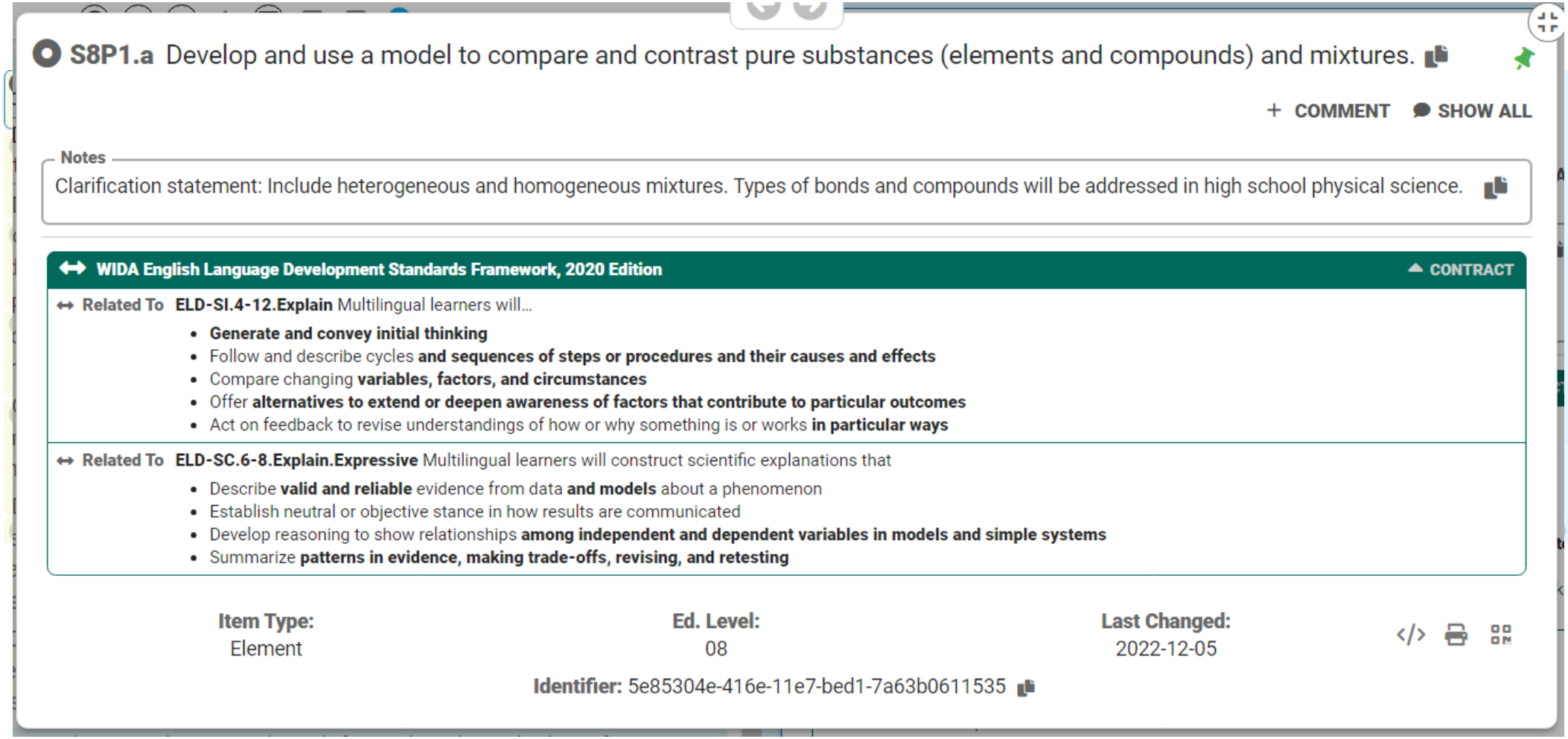
Suitcase


Framework Index
Search framework titles, categories, and identifiers
Show Sandboxes
Georgia Standards: Current Versions
Computer Science -
English Language Arts -
Georgia's K-12
Health - Georgia Standards of Excellence - 2021
Social Studies - Georgia Standards of Excellence
SuitCASE
Science - Georgia S
Science - Georgia Standards
Elementary Science K-5
Middle School Science 6-8
High School Science 9-12
40.06100 Science/Grade 6
26.01100 Science/Grade 7
40.01700 Science/Grade 8
High School Science 9-12
40.02100 Astronomy
26.01200 Biology
26.03100 Botany
40.05100 Chemistry
40.06400 Earth Systems
26.06110 Environmental Science
40.01100 Physical Science
40.08100 Physics
26.07300 Human Anatomy & Physiology
40.09300 Forensic Science
26.06100 Ecology
26.07200 Entomology
26.06500 Epidemiology
40.06300 Geology
40.04100 Meteorology
26.05100 Microbiology
40.07100 Oceanography
26.07100 Zoology
SHOW ALL

Suitcase

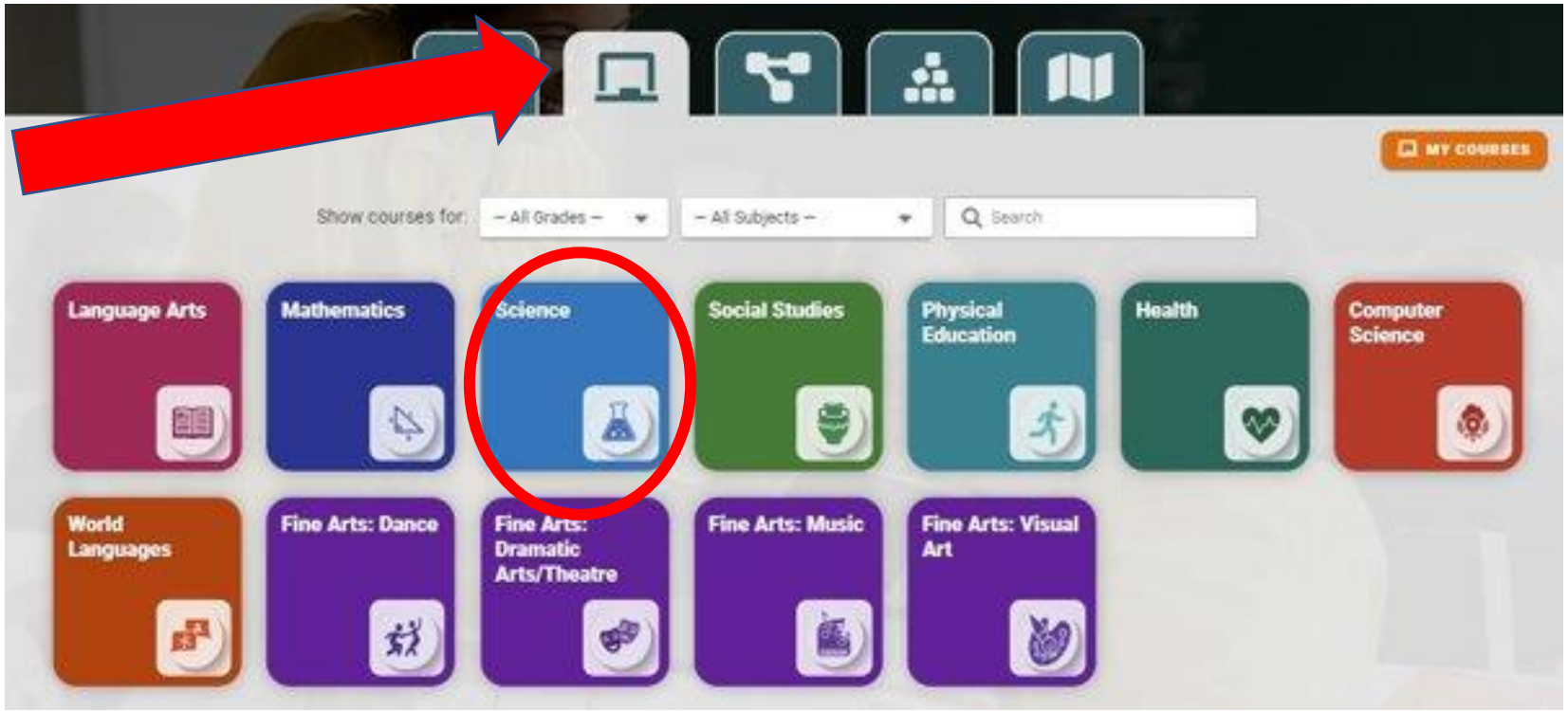

Middle School Science 6-8
40.061
26.011
40.017
Phys
S
p
S
o
w
S
re
S
el
S
m
S8P1 Obtain, evaluate, and communicate information about the structure and properties of matter.
S8P1.a Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures.
S8P1.b Develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed.
S8P1.c Plan and carry out investigations to compare and contrast chemical (i.e., reactivity, combustibility) and physical (i.e., density, melting point, boiling point) properties of matter.
S8P1.d Construct an argument based on observational evidence to support the claim that when a change in a substance occurs, it can be classified as either chemical or physical.
S8P1.e Develop models (e.g., atomic-level models, including drawings, and computer representations) by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms (protons, neutrons, and electrons) and simple molecules.
S8P1.f Construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants.
d
ervation
another
t
at
aves.
y, and

Suitcase


S8P1.a Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures.
+ COMMENT
SHOW ALL
Notes
Clarification statement: Include heterogeneous and homogeneous mixtures. Types of bonds and compounds will be addressed in high school physical science.
WIDA English Language Development Standards Framework, 2020 Edition
CONTRACT
Related To ELD-SI.4-12.Explain Multilingual learners will...
Generate and convey initial thinking
Follow and describe cycles and sequences of steps or procedures and their causes and effects
Compare changing variables, factors, and circumstances
Offer alternatives to extend or deepen awareness of factors that contribute to particular outcomes
Act on feedback to revise understandings of how or why something is or works in particular ways
Related To ELD-SC.6-8.Explain.Expressive Multilingual learners will construct scientific explanations that
Describe valid and reliable evidence from data and models about a phenomenon
Establish neutral or objective stance in how results are communicated
Develop reasoning to show relationships among independent and dependent variables in models and simple systems
Summarize patterns in evidence, making trade-offs, revising, and retesting
Item Type:
Element
Ed. Level:
08
Last Changed:
2022-12-05
Identifier: 5e85304e-416e-11e7-bed1-7a63b0611535

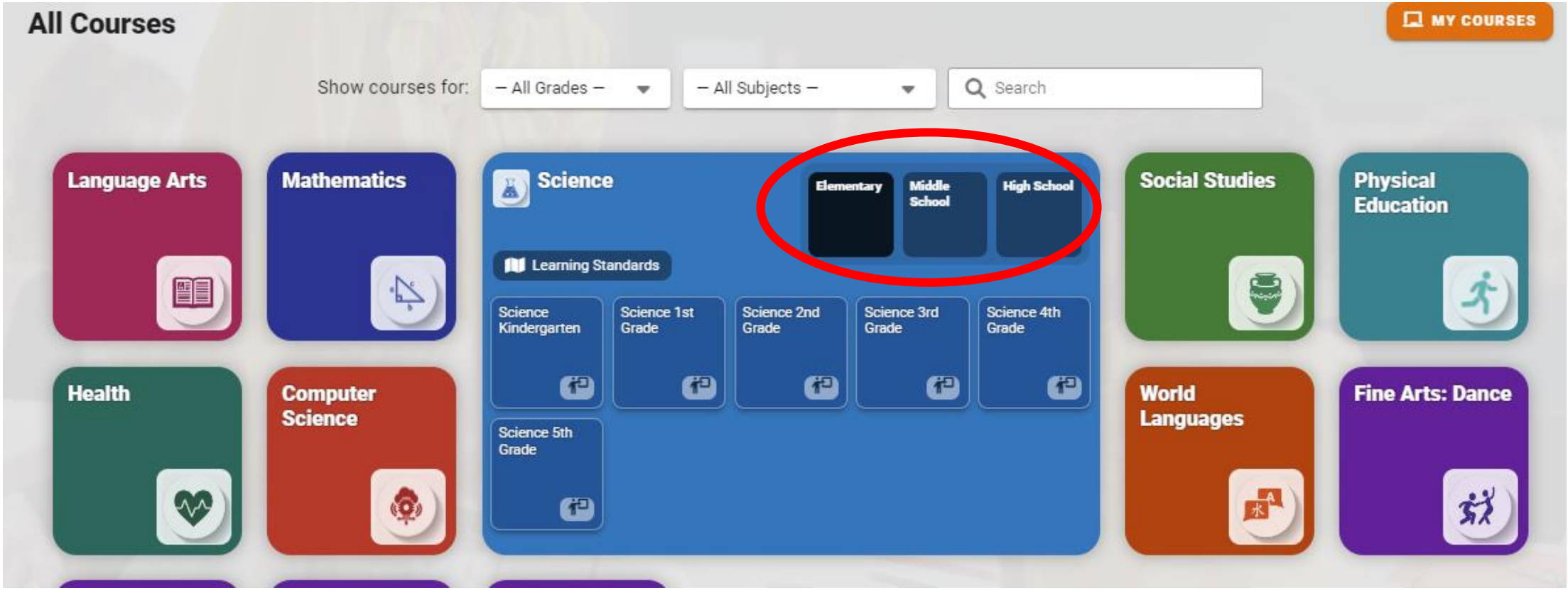
GaDOE Inspire- The One Stop Shop for Instructional Resources

All instructional resources are located here in this tab.

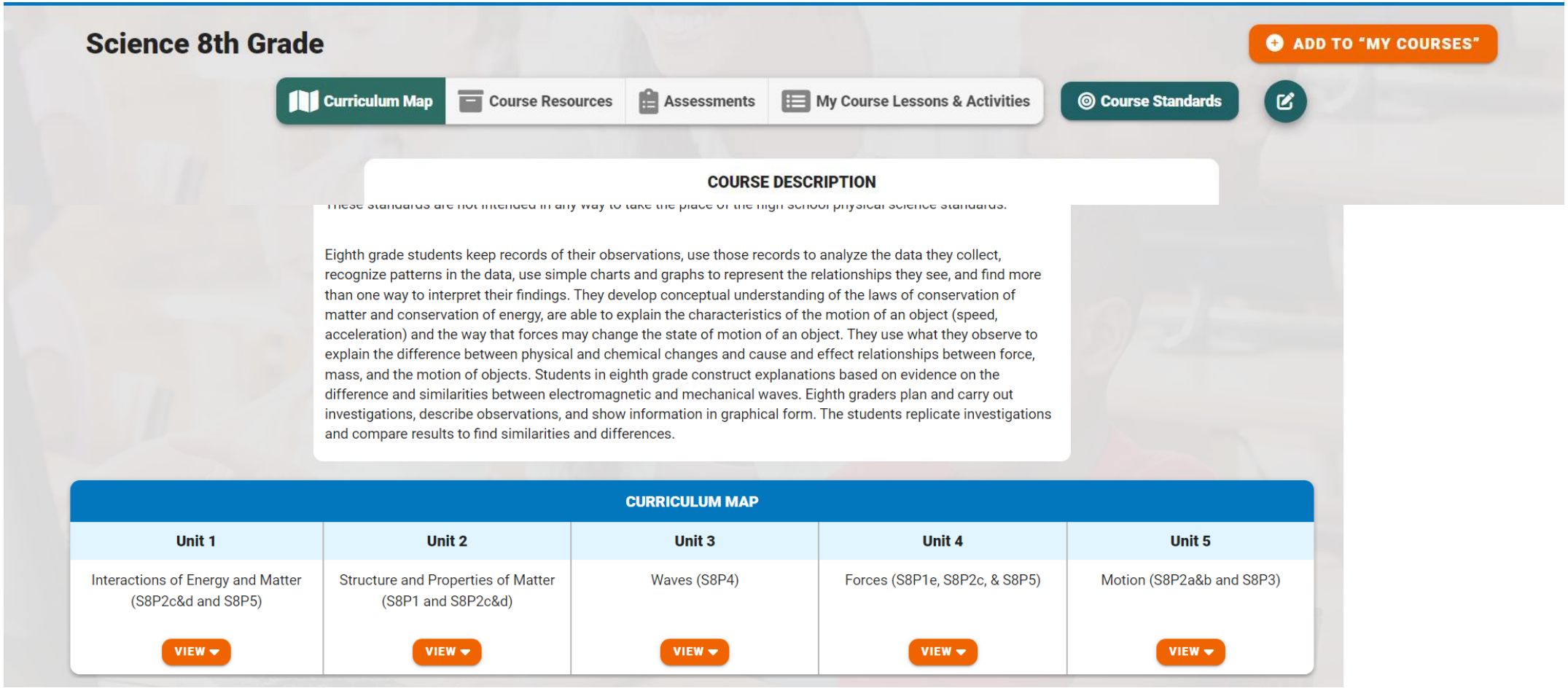


GaDOE Inspire Science Courses

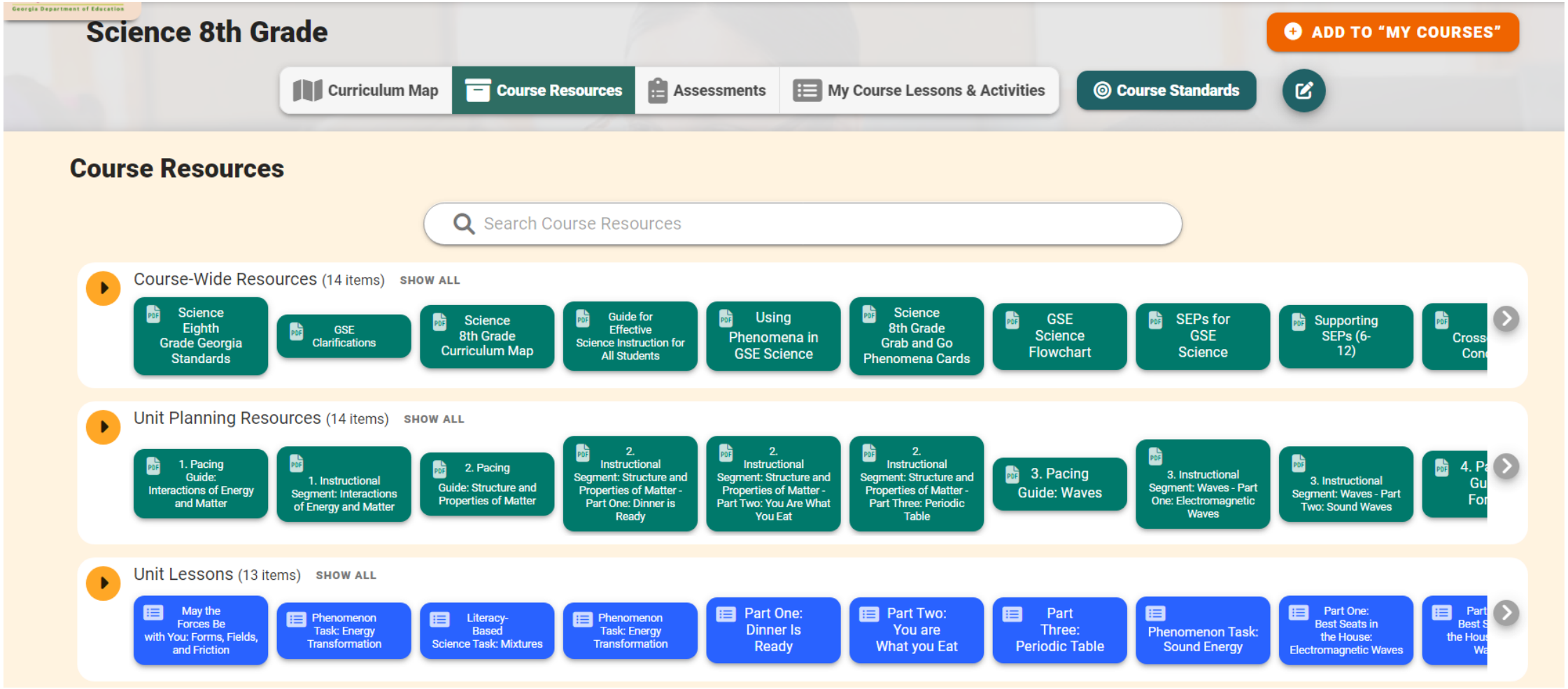
Select grade band, then the grade or course you need.



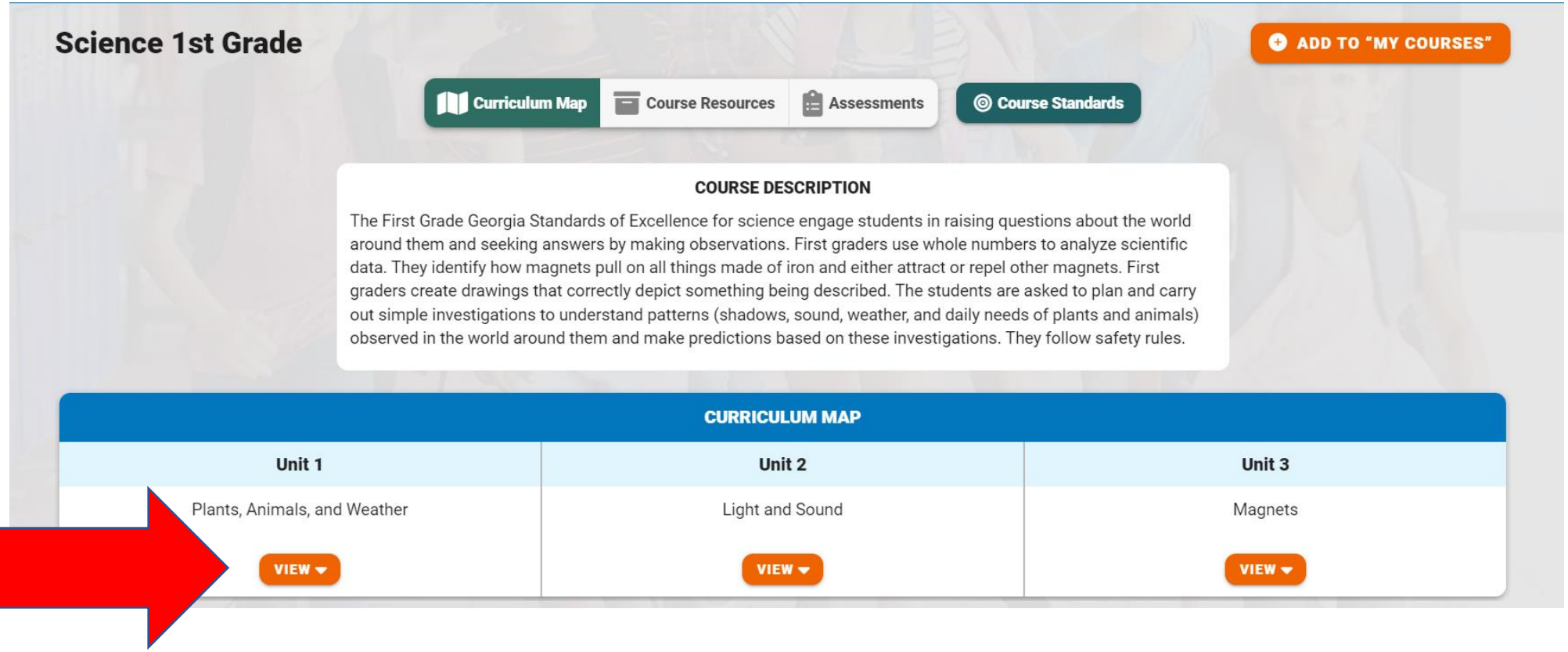
GaDOE Inspire
Grade or Course Landing Page



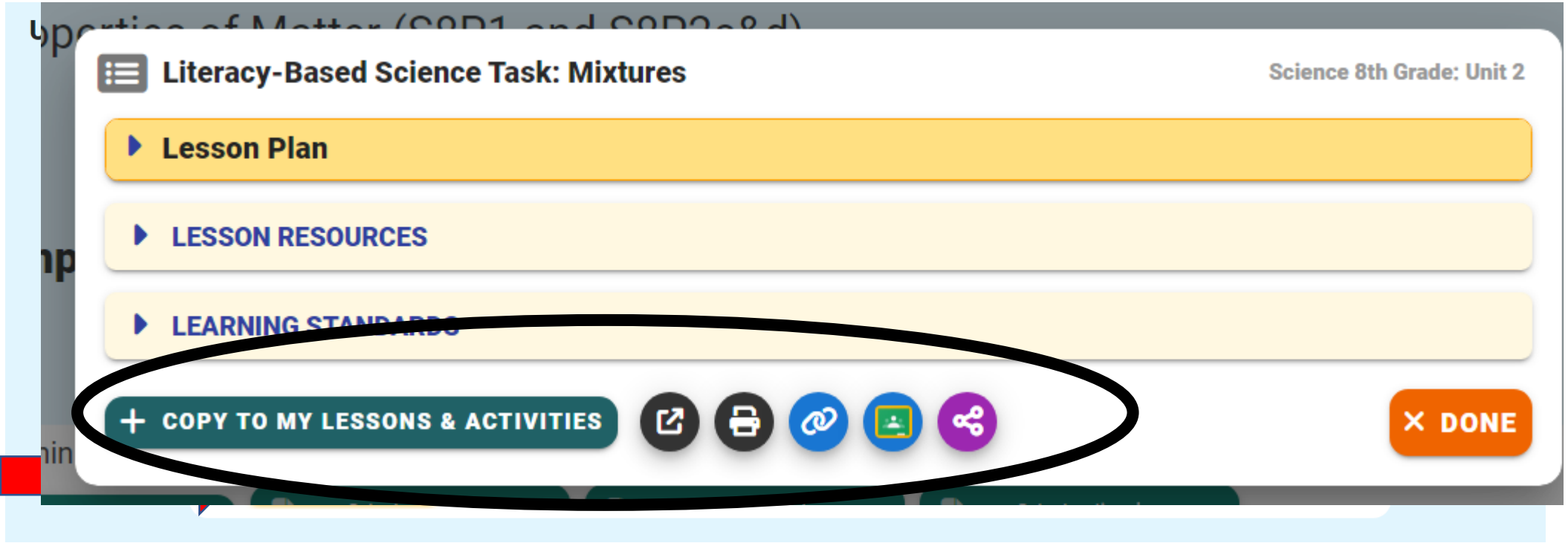
GaDOE Inspire Course Resources



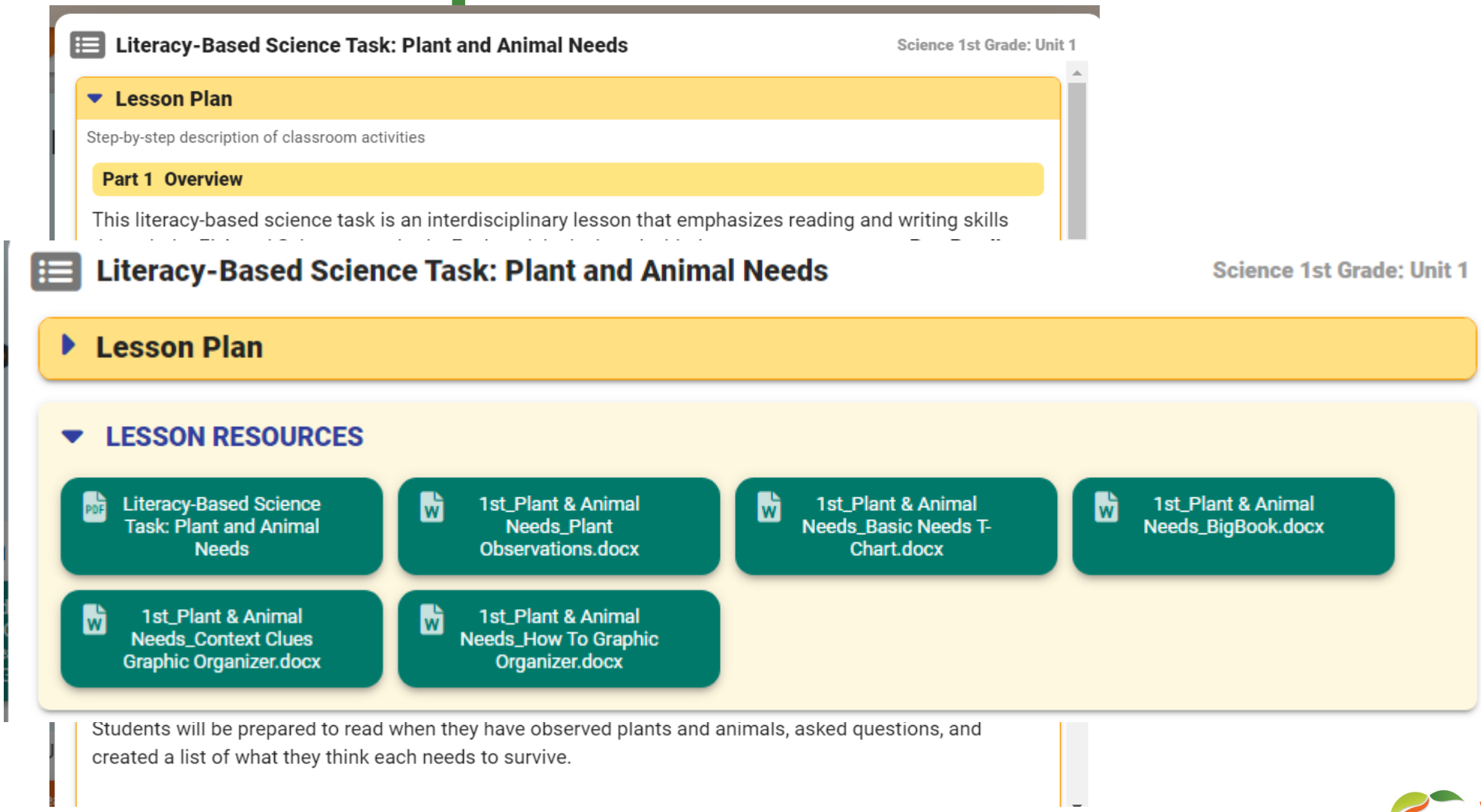
GaDOE Inspire Curriculum Map



GaDOE Inspire
Lessons and Resources



GaDOE Inspire- Lesson Resources

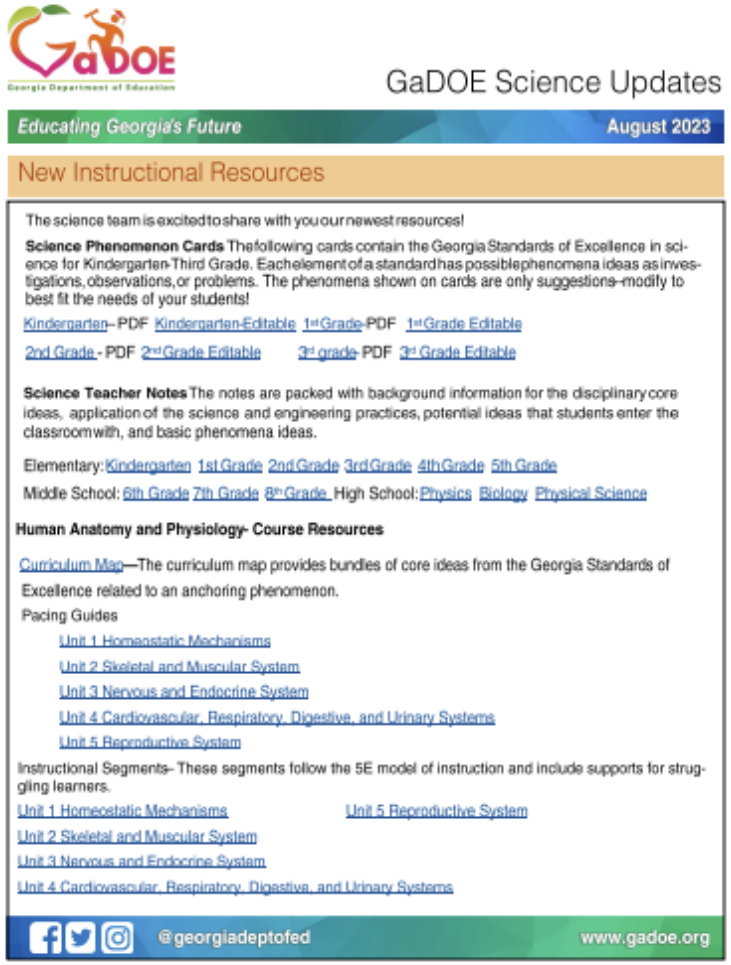


Other Places to Find GaDOE Resources

- Georgia Department of Education Science Webpage
- Integrated Instructional Supports for All Students

GaDOE Science Resources- August

Available Here: August Science Update



GaDOE Science Updates

Educating Georgia's Future August 2023

New Instructional Resources

The science team is excited to share with you our newest resources!

Science Phenomenon Cards The following cards contain the Georgia Standards of Excellence in science for Kindergarten-Third Grade. Each element of a standard has possible phenomena ideas as investigations, observations, or problems. The phenomena shown on cards are only suggestions-modify to best fit the needs of your students!

Kindergarten- PDF Kindergarten-Editable 1st Grade-PDF 1st Grade Editable

2nd Grade - PDF 2nd Grade Editable 3rd grade- PDF 3rd Grade Editable

Science Teacher Notes The notes are packed with background information for the disciplinary core ideas, application of the science and engineering practices, potential ideas that students enter the classroom with, and basic phenomena ideas.

Elementary: Kindergarten 1st Grade 2nd Grade 3rd Grade 4th Grade 5th Grade

Middle School: 6th Grade 7th Grade 8th Grade High School: Physics Biology Physical Science

Human Anatomy and Physiology- Course Resources

Curriculum Map—The curriculum map provides bundles of core ideas from the Georgia Standards of Excellence related to an anchoring phenomenon.

Pacing Guides

- Unit 1 Homeostatic Mechanisms
- Unit 2 Skeletal and Muscular System
- Unit 3 Nervous and Endocrine System
- Unit 4 Cardiovascular, Respiratory, Digestive, and Urinary Systems
- Unit 5 Reproductive System

Instructional Segments- These segments follow the 5E model of instruction and include supports for struggling learners.

Unit 1 Homeostatic Mechanisms
Unit 2 Skeletal and Muscular System
Unit 3 Nervous and Endocrine System
Unit 4 Cardiovascular, Respiratory, Digestive, and Urinary Systems
Unit 5 Reproductive System

@georgiadeptofed www.gadoe.org

GaDOE Science Resources- April

- Available here: Resource update

GaDOE Science Updates

Educating Georgia's Future April 2023

New Resources

The science team is excited to share with you our newest resources!

Science Phenomenon Cards The following cards contain the Georgia Standards of Excellence in science for Kindergarten. Each element of a standard has possible phenomena ideas as investigations, observations, or problems. The phenomena shown on cards are only suggestions--modify to best fit the needs of your students!

Kindergarten– PDF Kindergarten-Editable

Science Literacy Plans These literacy-based science tasks are three-dimensional science lessons that leverage literacy skills to deepen student understanding of science through reading and writing. All student sheets and teacher materials are included!

Kindergarten: Sink or Float | Kindergarten: Living or Nonliving | Kindergarten: Soil
1st Grade: Magnets | 1st Grade: Plant & Animal Needs | 1st Grade: Weather
2nd Grade: Structures | 3rd Grade: Water Pollution | 4th Grade: Energy Flow

Science Phenomenon Tasks These instructional tasks are phenomenon-driven plans that utilize the science and engineering practices and crosscutting concepts. The plans are not tied to existing instructional segments and can be implemented regardless of pacing!

Physics: Systems | Physics: Open & Closed Systems | Physics: Nuclear Processes
Physics: Motion Graphs | Physics: Magnitude & Vector | Physics: Lightning
Physics: Half-life Radioactive Locations | Physics: Half-life Chernobyl
Physics: Current, Voltage, & Power | Physics: Conservation of Energy

Science Formative Assessment Choice Boards These formative assessment choice boards are phenomenon-driven plans that utilize the science and engineering practices and crosscutting concepts. The plans are not tied to existing instructional segments and can be implemented regardless of pacing!

Physics: Newton's Laws | Physics: Motion Graphs | Physics: Momentum
Physics: Light | Physics: Energy | Physical Science: Waves
Physical Science: Specific Heat | Physical Science: Mechanical Advantage
Physical Science: Acids & Bases | Chemistry: Stoichiometry | Chemistry: Periodic Trends
Chemistry: Solutions Boiling and Melting | Chemistry: Light and Electrons | Chemistry: Bonding

GaDOE Science Resources - February

- Available here: Resource update

Science February 2023

New Resources

Science Teacher Notes The notes are packed with background information for the disciplinary core ideas, application of the science and engineering practices, potential ideas that students enter the classroom with, and basic phenomena ideas.

Kindergarten 1st Grade 2nd Grade 3rd Grade 4th Grade 5th Grade

Science Multimodality Stations The multimodality stations leverage language development to deepen student understanding of science through listening, reading, speaking, and writing.

Kindergarten Multimodality: Grouping Animals
2nd Grade Multimodality: Life Cycles
3rd Grade Multimodality: Animals and Plants
3rd Grade Multimodality: Pollution
4th Grade Multimodality: Energy
5th Grade Multimodality: Microorganisms
5th Grade Multimodality: Instincts and Learned Behaviors
5th Grade Multimodality: Cells
7th Grade Multimodality: Artificial Selection
7th Grade Multimodality: Cells
7th Grade Multimodality: Interdependence
Biology Multimodality Station: Cells
Biology Multimodality: Asexual Reproduction
Biology Multimodality Station: Energy
Biology Multimodality Station: Evidence for Evolution

Science Literacy Plans These literacy-based science tasks are three-dimensional science lessons that leverage literacy skills to deepen student understanding of science through reading and writing. All student sheets and teacher materials are included!

Kindergarten: Day and Night
1st Grade: Light
2nd Grade: Shadows
3rd Grade: Fossils
4th Grade: Ecosystems
5th Grade: Erosion
6th Grade: Tornadoes
7th Grade: Cells
8th Grade: Mixtures

Frameworks

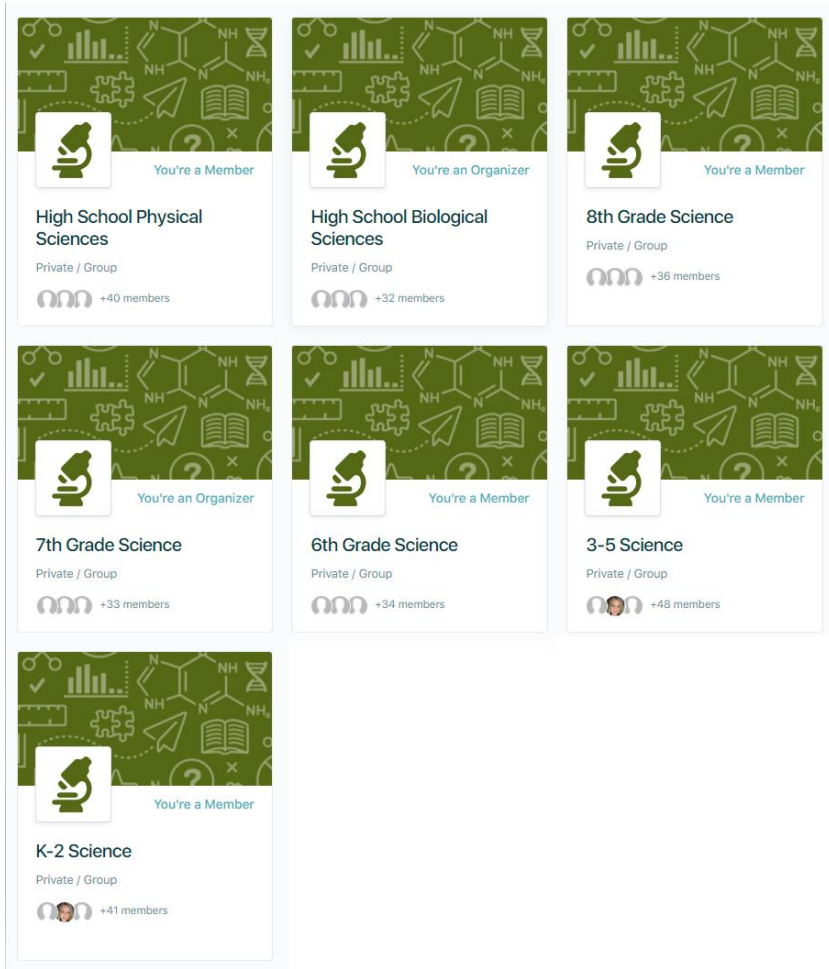
- Frameworks
  - Curriculum maps
  - Instructions segments
  - Pacing Guides
  - Teacher Notes

- Additional HS courses
  - Oceanography
  - Zoology

Communication

Teacher Communities

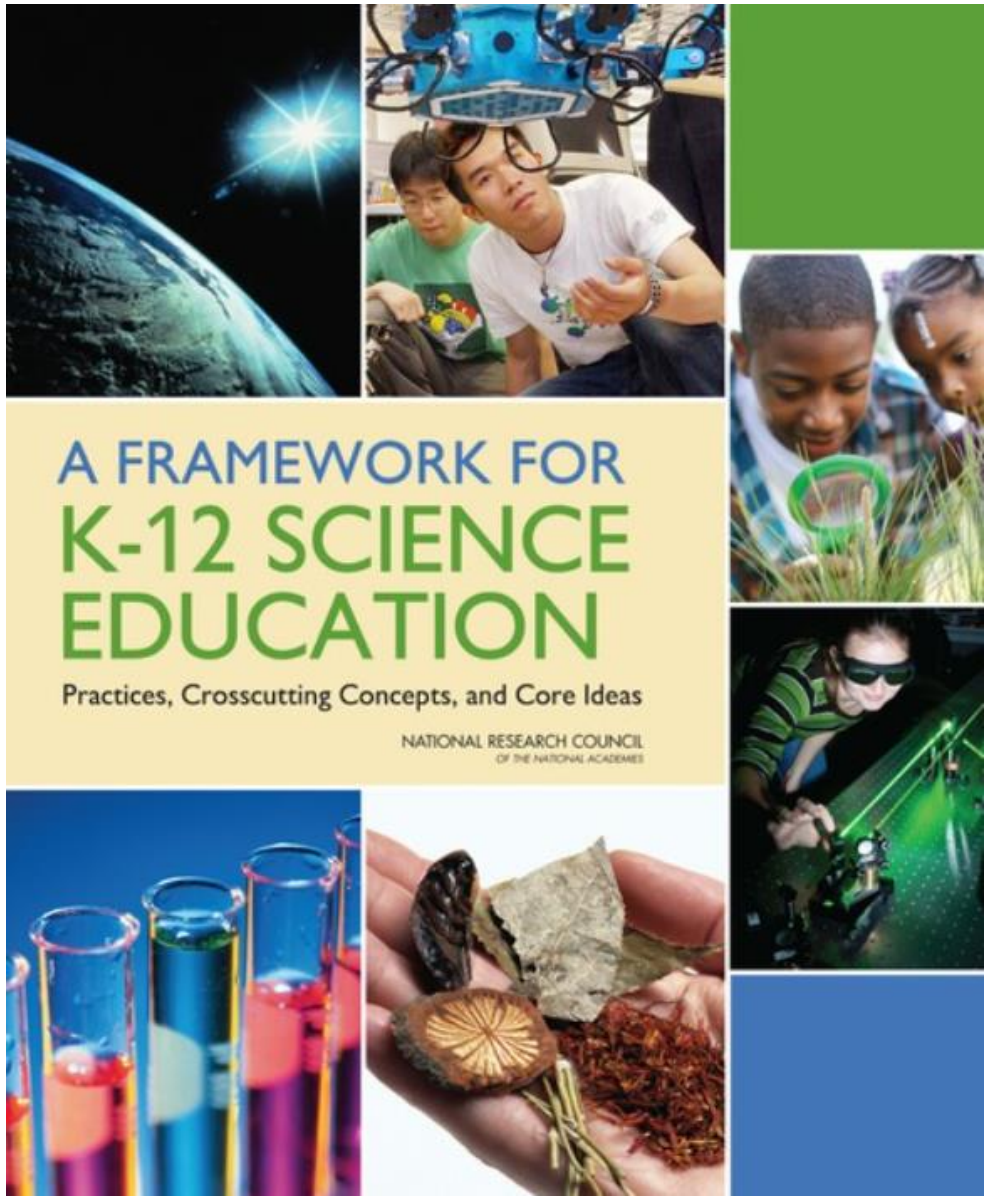
- Teacher Communities
  - Sign up information
- Virtual Specialist
  - Georgia educator with experience in the science classroom
  - Webinars Recorded
  - Discussion posts for collaboration



Outside Resources

Framework

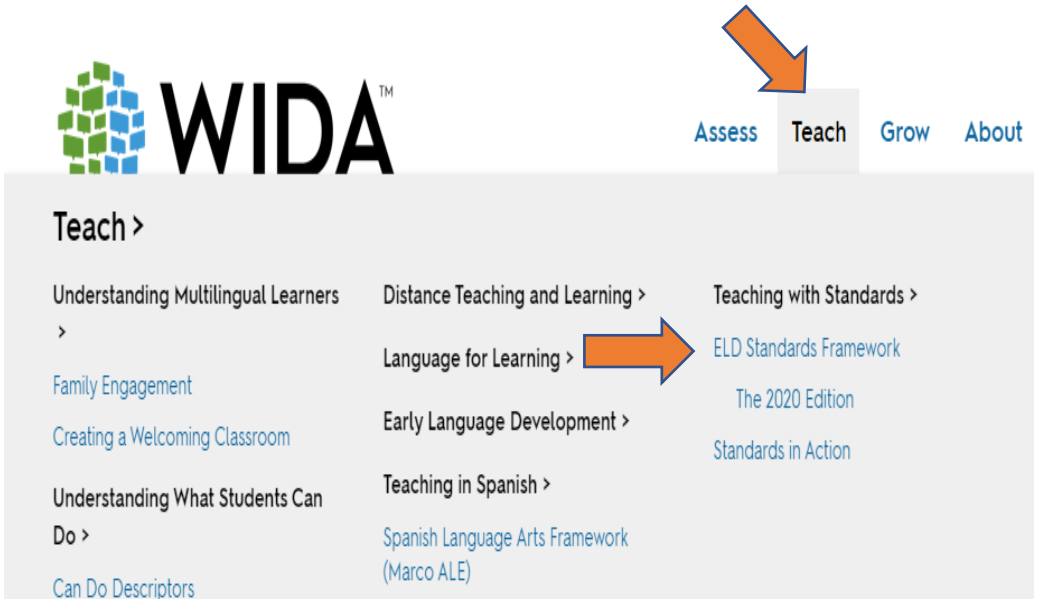
- A Framework for K-12 Science Education



Locating WIDA Resources: Free downloads!

WIDA Website:

Complete Publication



WIDA Website:

Grade-Level Cluster-Specific Materials

GSTA Phenomenon Bank

- Georgia Science Teacher Association Phenomenon Bank
  - Phenomena submitted by Georgia Teachers
  - Can be sorted by standard and element

- Have a great phenomena to share?
  - Submit it to the GSTA bank

Q and A

Session Survey:
bit.ly/ScienceSurvey22

Offering a holistic education to
each and every child
in our state.

www.gadoe.org

@georgiadeptofed

youtube.com/user/GaDOEmedia

GaDOE
Georgia Department of Education