

**Literacy in Biology:
CCSS and the Curriculum**

Biology
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Trainer:

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**Common Core State Standards:
A New Foundation for
Student Success**



CCSS Focus Points for Science Teachers

- continue to develop and practice habits of Common Core throughout the 2013 - 2014 year.
- present lessons that align with NGSS student performance expectations.
- move beyond multiple choice questions and use additional measures of students' content knowledge.
- use the CERR writing model.

Mission Statement of the CCSS

“The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy.”



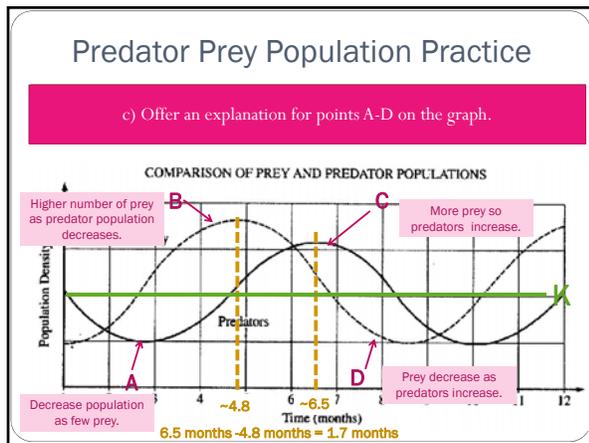
COMMON CORE
STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

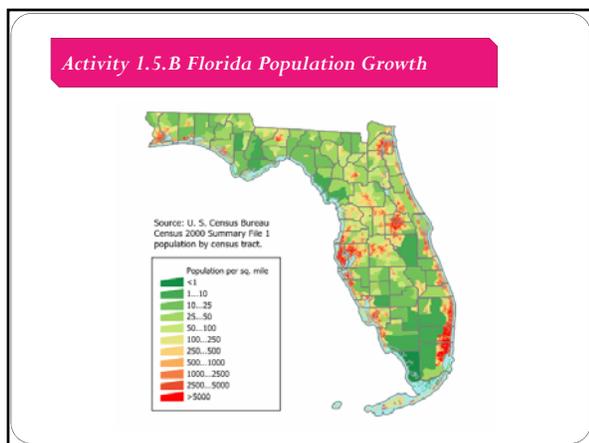
Shifts

- There are 12 pedagogical shifts that the Common Core requires of us if we are to be truly aligned with it in terms of curricular materials and classroom instruction.
 - 6 ELA/Literacy
 - 6 Mathematics



Shifts in Mathematics		
Shift #1	Focus	Teachers significantly narrow and deepen the scope of how time and energy is spent in the math classroom. They do so in order to focus deeply on only the concepts that are prioritized in the standards.
Shift #2	Coherence	Principals and teachers carefully connect the learning within and across grades so that students can build new understanding onto foundations built in previous years.
Shift #3	Fluency	Students are expected to have speed and accuracy with simple calculations; teachers structure class time and/or homework time for students to memorize, through repetition, core functions.
Shift #4	Deep Understanding	Students deeply understand and can operate easily within a math concept before moving on. They learn more than the trick to get the answer right. They learn the math.
Shift #5	Application	Students are expected to use math and choose the appropriate concept for application even when they are not prompted to do so.
Shift #6	Dual Intensity	Students are practicing and understanding. There is more than a balance between these two things in the classroom - both are occurring with intensity





Shifts in ELA/Literacy		
Shift #1	Balancing Informational & Literary Text	Students read a true balance of informational and literary text.
Shift #2	Knowledge in the Disciplines	Students build knowledge about the world through text rather than the teacher or activities.
Shift #3	Staircase of Complexity	Students read central, grade appropriate text around which instruction is centered. Teachers are patient and create more time and space and support in the curriculum for close reading.
Shift #4	Text-based Answers	Students engage in rich and rigorous evidence-based conversations about text.
Shift #5	Writing from Sources	Writing emphasizes use of evidence from sources to inform or make an argument.
Shift #6	Academic Vocabulary	Students constantly build the transferable vocabulary they need to access grade level complex texts. This can be done effectively by spiraling like content in increasingly complex text.

Power Anchor Standards

- Reading Standard #1
The Close Reading Standard
- Reading Standard #4
The Vocabulary Standard
- Reading Standard #10
The Text Complexity Standard
- Writing Standard #1
The Argument Standard



Trajectories & Vertical Alignment

Trajectory

- what it looks like - R.CCR.1 . . . RST.11-12.1

Alignment

- What were students doing last year and what will they be doing this year relevant to the CCSS standards

Close Reading

"Close Reading...can be an effective strategy for deepening content knowledge and learning to read like an expert in all academic disciplines."

Implementing the Common Core State Standards: A Primer on "Close Reading of Text" pg 4

Comprehensive Instructional Sequence (CIS)

- content-area knowledge
- brief vocabulary instruction
- reading comprehension infused
- critical thinking about complex texts
- multiple readings of the text facilitate deeper thinking
- integrated and sustained text-based discussions
- writing used throughout – prediction question, text-marking, note-taking, and essay response

Steps to CIS

1. Hook
2. Prediction question or what do you know question (Question #1)
3. Pass out passage/article
4. Number paragraphs/sections
5. Pre-teach vocabulary
6. Assign text-marking
 - Students will read independently, in groups of 4, in groups of 3, or in pairs. (This is students' first exposure to text)
7. Answer question #2 (Refer back to text)
8. Directed note-taking (Refer back to text)

	Group	Individual	Change of mind?
Category 1			
Category 2			
Category 3			
Category 4			
9. Answer last question (#3) independently and make an evaluation (Refer back to text)
Students do NOT write an essay yet; they just answer the question. They write the essay at the very end.
10. Collaborate with group and present argument to whole group
11. Re-vote (After hearing arguments, students are allowed to change their answer.)
12. Question Generator
13. Write formal essay with thesis statement, supporting paragraphs, cited evidence, quotes from the author/text, correct punctuation, correct grammar, correct spelling, conclusion

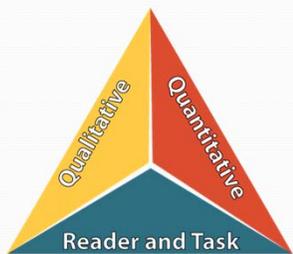
CIS is NOT

- Giving students an outline of information to read
- Presenting a PowerPoint of the content for students to take notes
- Predigesting the text for students
- Summarizing the text for students

CIS..

- allows students to do the work of reading.
- allows students to grapple with complex text.
- allows students to learn from the text.
- helps students develop habits that are necessary for them to be successful in college & careers.

Text Complexity



Introducing CER to Students

- Explanations drive science!



The Science of Curiosity: Seeking Signs of Past

CURIOSITY LANDING SITE:
GALE RATER

What are these scientists curious about -- what do they want to know?

What data will the rover collect?

How will this data help scientists answer -- make claims about -- their questions?

Introducing CER to Students

- Have students identify the **claim**, the **evidence**, and the **reasoning** – or rule – that connects the evidence to the little girl's claim that her dad is a space alien.



My dad's an alien | Business Car Manager | Bing

CER Worksheet

Data (Observations)

Claim

Evidence (from your data)

Evidence (from your data)

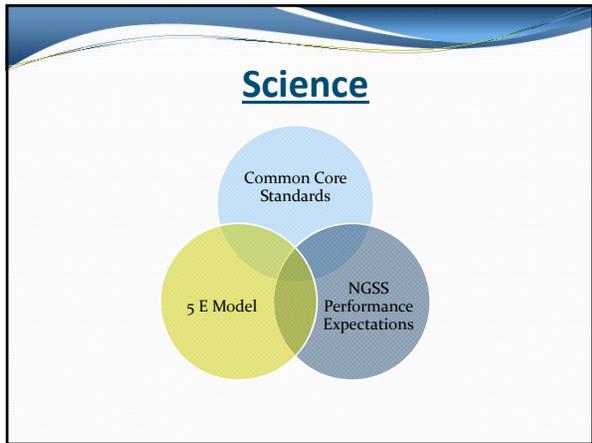
Evidence (from your data)

Reasoning (connect evidence to claim)

Reasoning (connect evidence to claim)

Reasoning (connect evidence to claim)





NGSS

HS-LS2 Heredity, Inheritance and Variation of Traits

How to read the standards >
Go back to search results

HS-LS2-1 Ask questions to clarify mechanisms of cell division and chromosomes in coding the instructions for chromosome function. **Clarify the mechanisms of cell division and chromosomes in coding the instructions for chromosome function.**

HS-LS2-2 Make and defend a claim based on evidence that inheritance of acquired genetic variations does not result from (1) new genetic combinations through meiosis, (2) random errors occurring during replication, and/or (3) mutations caused by environmental factors. **Make and defend a claim based on evidence that inheritance of acquired genetic variations does not result from (1) new genetic combinations through meiosis, (2) random errors occurring during replication, and/or (3) mutations caused by environmental factors.**

HS-LS2-3 Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. **Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.**

The performance expectations listed here are intended to be used in conjunction with the following:

Practices	Cross-Cutting Concepts	Disciplinary Core Ideas
<ul style="list-style-type: none"> Asking questions for clarification Defining a problem Using a model Planning and carrying out an investigation Analyzing and interpreting data Using mathematics and computational thinking Constructing an argument from evidence Engaging in peer review Communicating scientific ideas 	<ul style="list-style-type: none"> Patterns Cause and Effect Scale, Proportion, and Quantity Systems and System Models Stability and Change 	<ul style="list-style-type: none"> Life Sciences Earth and Space Science Physical Sciences

What should my students be able to do with this information?

Easy CC Correlations

What do my students need to KNOW?

NGSS

Science Concepts

“DOING” Science

- 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

Crosscutting Concepts

Major Themes

1. Patterns.
2. Cause and effect: Mechanism and explanation.
3. Scale, proportion, and quantity.
4. Systems and system models.
5. Energy and matter: Flows, cycles, and conservation
6. Structure and function.
7. Stability and change.

Vocabulary

Tier 2 words

- General Academic words
- Likely to appear in texts on other subjects
- May have multiple meanings

Examples:

- Relative
- Formulate
- Calibrate
- periphery

Tier 3 words

- Domain specific words
- Important to the concept under study
- Unlikely to appear in texts on other subjects

Examples

- carcinogens
- Mitosis
- lithosphere
- Kelvin

Vocabulary

Biochemistry Concept Map

Organize the information we learned about macromolecules in this chart.

Directed Note Taking

Directed Note-Taking
Directions: Record notes containing the most important information relevant to the guiding question.

"Chemical Reactions"

Guiding Question: How are endothermic and exothermic chemical reactions used in sports, medicine, entertainment, and the military?

Paragraph	Notes	Check Relevant Categories				
		Endothermic reactions	Exothermic reactions	Storage & packaging of products	Organization of job	Needs & demands of customers

Considerate Work: After completing your chart, be prepared to compare your notes with others.

Scaffolding Directed Note taking

Directed Note-Taking
Directions: Record notes containing the most important information relevant to the guiding question.

"Chemical Reactions"

Guiding Question: How are endothermic and exothermic chemical reactions used in sports, medicine, entertainment, and the military?

Paragraph	Notes	Endothermic reactions	Exothermic reactions	Storage & packaging of products	Organization of job	Needs & demands of customers
1	A coach numbs a player's injured thumb with a white plastic bag, and the player is able to finish and win the game.					
2	An instant cold pack needs no refrigeration and can be stored in first aid kit for months and will produce cold instantaneously.					
	A cold pack has 2 bags, one inside the other. The outer bag contains powder and the inner bag contains water. The powder and water are kept separate until the outer bag is punched/broken.					
	A reaction that absorbs heat is endothermic and a reaction that produces heat is exothermic.					

Where do we go from here?

Science meeting Common Core

- I will teach my students to digest complex informational text within the field of science with independence and confidence using Common Core Literacy Standards and 5E/Inquiry instruction.

Think-Pair-Share

- What are your needs and next steps for you to implement these lessons and strategies?

Resources

- Common Core Website
 - <http://www.corestandards.org/>
- Next Generation Science Website
 - <http://www.nextgenscience.org/>
- Hillsborough County Educator Resources Page (Assortment of Resources)
 - <http://ccss.mysdhc.org/EducatorResources>
- Resources for Understanding the Common Core State Standards
 - <http://www.edutopia.org/common-core-state-standards-resources#graphi>
- Resources for Implementing the Common Core State Standards
 - <http://www.pinterest.com/edutopia/common-core/>
- Smithsonian article, "What to Make of the Debate over Common Core"
 - <http://www.smithsonianmag.com/innovation/what-to-make-of-the-debate-over-common-core-3000201/>
- Common Core State Standards, "Myths and Facts"
 - http://www.ascd.org/ASCD/pdf/siteASCD/publications/policypoints/PolicyPoints_Common_Core_State_Standards.pdf



Questions???

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