Sycamore Educators Day

A District Focus on the Common Core State Standards

Vigo County School Corporation

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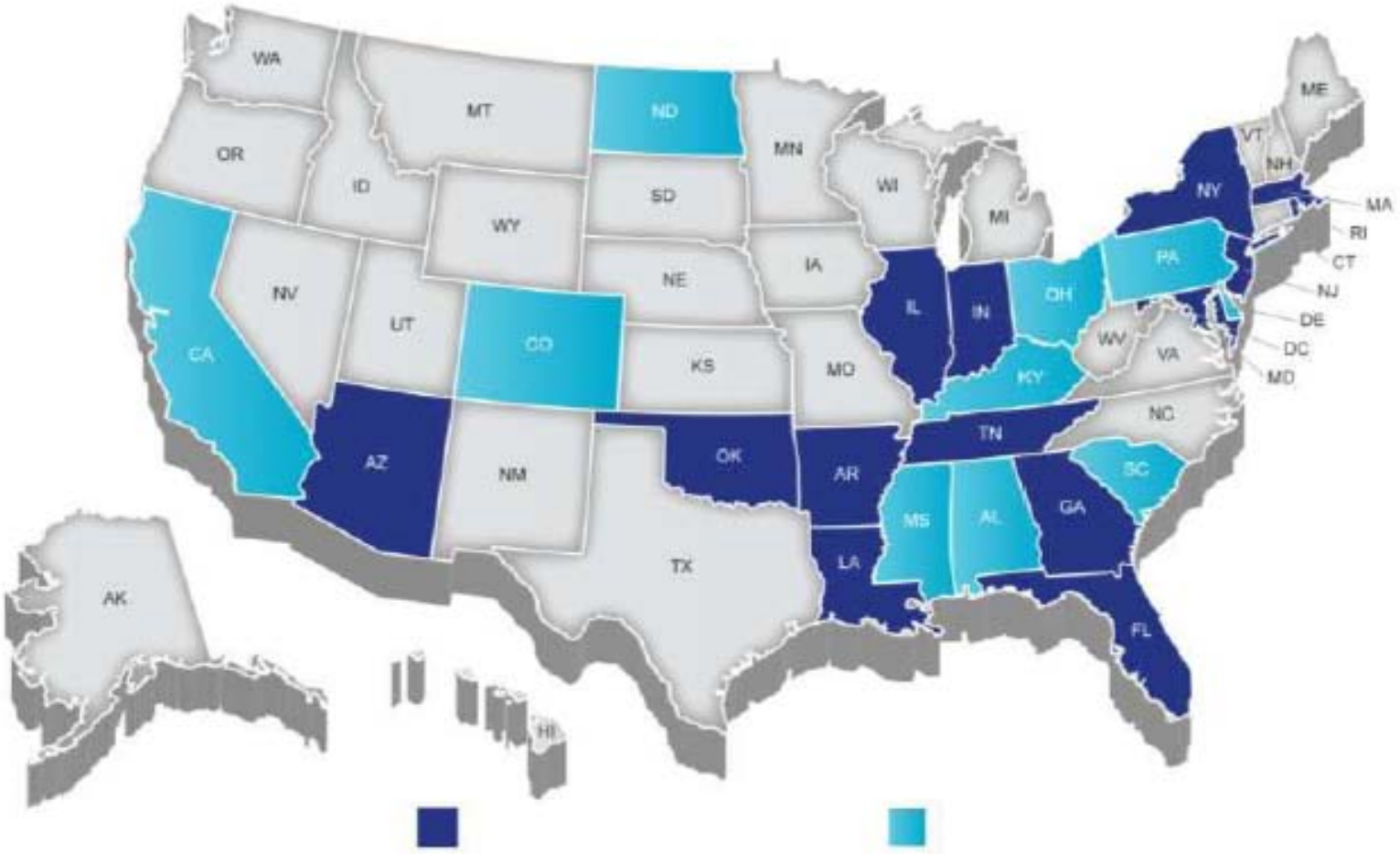
The Common Core State Standards Initiative

Beginning in the spring of 2009, Governors and state commissioners of education from 48 states, 2 territories and the District of Columbia committed to developing a common core of state K-12 English-language arts (ELA) and mathematics standards.

The **Common Core State Standards Initiative (CCSSI)** is a state-led effort coordinated by the National Governors Association (NGA) and the Council of Chief State School Officers (CCSSO).

www.corestandards.org

STATES IN THE PARTNERSHIP FOR ASSESSMENT OF READINESS FOR COLLEGE AND CAREERS



Indiana Department of Education
SUPPORTING STUDENT SUCCESS

Why Common Core State Standards?

- **Preparation:** The standards are college- and career-ready. They will help prepare students with the knowledge and skills they need to succeed in education and training after high school.
- **Competition:** The standards are internationally benchmarked. Common standards will help ensure our students are globally competitive.
- **Equity:** Expectations are consistent for all – and not dependent on a student's zip code.
- **Clarity:** The standards are focused, coherent, and clear. Clearer standards help students (and parents and teachers) understand what is expected of them.
- **Collaboration:** The standards create a foundation to work collaboratively across states and districts, pooling resources and expertise, to create curricular tools, professional development, common assessments and other materials.

Math

Design and Organization

- Standards for Mathematical Practice
  - Carry across all grade levels
  - Describe habits of mind of a mathematically expert student
- Standards for Mathematical Content
  - K-8 standards presented by grade level
  - High School standards presented by conceptual theme
- Appendix
  - Designing High School Mathematics courses based on CCSS

Math

Key Math Advances

Focus and coherence

- Focus on key topics at each grade level.
- Coherent progressions across grade levels.

Balance of concepts and skills

- Content standards require both conceptual understanding and procedural fluency.

Mathematical practices

- Foster reasoning and sense-making in mathematics.

College and career readiness

- Level is ambitious but achievable.

Math

Habits of Mind fostered by CCSS

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Mathematics K CCSS Alignment: Step I

- State Curriculum Mapping
- http://media.doe.in.gov/curriculum/CurriculumMapping.html
  - Link to the IDOE Curriculum Maps

separating situations with sets of objects, or eventually with equations such as 5 + 2 = 7 and 7 - 2 = 5. (Kindergarten students should see addition and subtraction equations, and student writing of equations in Kindergarten is encouraged, but it is not required.) Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

2. Students describe their physical world using geometric ideas (e.g., shape, orientation, spatial relations) and vocabulary. They identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of ways (e.g., with different sizes and orientations), as well as three-dimensional shapes such as cubes, cones, cylinders, and spheres. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.

Connecting the Standards for Mathematical Practice to the Standards for Mathematical Content

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. Designers of curricula, assessments, and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.

The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word "understand" are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging in the mathematical practices.

In this respect, those content standards which set an expectation of understanding are potential "points of intersection" between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit the time, resources, innovative energies, and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development, and student achievement in mathematics.

Scope and Sequence

Timeframe	Unit	Instructional Topics
45 Day(s)	Quarter 1	1. Mathematical Practices 2. Counting and Cardinality 3. Number and Operations Base Ten 4. Measurement and Data 5. Geometry
45 Day(s)	Quarter 2	1. Mathematical Practices 2. Counting and Cardinality 3. Operations and Algebraic Thinking 4. Geometry 5. Number and Operations in Base Ten 6. Measurement and Data
45 Day(s)	Quarter 3	1. Mathematical Practices 2. Counting and Cardinality 3. Operations and Algebraic Thinking 4. Number and Operations in Base Ten 5. Measurement and Data 6. Geometry
45 Day(s)	Quarter 4	1. Mathematical Practices 2. Counting and Cardinality 3. Operations and Algebraic Thinking 4. Number and Operations in Base Ten 5. Measurement and Data 6. Geometry

Course Details

UNIT: Quarter 1 -- 45 Day(s)

Sample Big Ideas

2011-12 KINDERGARTEN COMMON CORE MATHEMATICS

TOPIC: Counting and Cardinality

Instructional Strategies

Children view counting as a mechanism used to land on a number. Young children mimic counting often with initial lack of purpose or meaning. Coordinating the saying, touching or moving objects in a one-to-one correspondence may be little more than a matching activity showing little or no conservation of quantity.

One of the first big concepts in a child's mathematical development is cardinality. Cardinality, knowing that the number said tells the quantity you have, and, that the number you end on when counting represents the entire amount counted. The big idea is that number means amount and no matter how you arrange and rearrange the items, the amount is the same. Until this concept is developed, counting is merely a routine ditty done when a number is needed.

Children develop the understanding of counting and cardinality from experience. Almost any activity or game that engages children in counting and comparing quantities, such as board games, will encourage the development of cardinality. Frequent opportunities to use and discuss counting as a means of solving problems relevant to kindergarteners is more beneficial than repeating the same routine day after day. For example, here is today's snack, is there enough for everyone to have a snack?

Like counting to 100 by either ones or tens, writing numerals from 0-20 is a rote process. Initially, children mimic the actual formation of the numeral while also assigning it a name. Over time, children create the understanding that numerals signify the meaning of counting. Numerals are used to communicate across cultures and through time a certain meaning. When children can see mental images of the numerals and use those images with which to think, then numerals have meaning. Practice naming and writing numerals paired with models that represent the meaning of the numerals within the context of life experiences for kindergarteners will bring mathematics to life. For example, dot cards, dominoes and dice all create different mental images for relating numerals, names and quantity meanings. Children will see mathematics as something that is alive and that they are involved.

Counting on or counting from a given number conflicts with the learned strategy of counting from the beginning. In order to be successful in counting on, children must understand cardinality. Children often merge or separate two groups of objects and then re-count from the beginning to determine the final number of objects represented. For these children, counting is still a rote skill or the benefits of counting on have not been realized. "Games" that require children to add on to a previous count to reach a goal number encourage developing this concept. Frequent and brief opportunities utilizing counting on and counting back are recommended. Once again, this is a concept that emerges over time and cannot be forced.

Instructional Resources

Board games: Candy Land, Chutes and Ladders, Hi Ho Cherry-O

Common Misconceptions

Students may believe: Counting is often a rote and non-meaningful task. Connecting situations to the need for counting will help develop the understanding of the meaning of cardinality.

Learning Targets	Monthly Calendar Routine – Daily Routine
K.CC.1.a. Count orally by ones to at least 30. Note: Goal of 100. New	Number of the Day / Monthly Calendar 1-3, 1-12, 2-6
K.CC.1.b. Count orally by tens to 30. Note: Goal of 100. New	(1-3) 1-12
K.CC.3.a. Recognize numbers from 0 to 10.	1-5, 1-16, 2-7, 2-8
K.CC.3.b. Print numbers from 0-9 when prompted. (Number formation)	1-3, 1-5, (1-14), 1-16, 2-6, 2-8, 2-9
K.CC.4.a. Count objects by touching them singularly while saying the number name.	Num Days Attended 1-3, 1-5, 1-14, 1-16, 2-6, 2-3, 2-9 2-11 2-12
K.CC.4.b-1. Recognize that the last number named tells the number of objects counted.	1-3, 1-5, 1-14, 1-16, 2-4, 2-8 2-4
K.CC.4.c. Recognize that each successive number name refers to a quantity that is one larger. New	1-3, 1-5, 1-14, 1-16, 2-6, 2-8, 2-9, 2-12

2011-12 KINDERGARTEN COMMON CORE MATHEMATICS

TOPIC: Number and Operations Base Ten

Instructional Strategies

Students need to construct their own base-ten ideas about quantities and their symbols by connecting to counting by ones. They should use a variety of manipulatives to model and connect these equivalent representations for the numbers 11-19. To represent 13, students can count by ones and show 13 beans. They can also represent 13 with a group and singles and show one group of 5 and 7 singles. They can count using a ten and ones to represent 13 and show one group of ten singles and 3 singles.

After the students are familiar with counting up to 19 objects by ones, have them explore different ways to group the objects that will make counting easier. Have them estimate before they count and group. Discuss their groupings and lead students to conclude that grouping by ten is desirable.

Kindergarteners should use proportional base-ten models, where a group of ten is physically ten times larger than the model for a one. Nonproprtional models such as an abacus and money should not be used at this grade level.

Students should impose their base-ten concepts on a model made from groupable and pregroupable materials (see Instructional Resources). Students can transition from groupable to pregroupable materials by leaving a group of ten intact to be reused as a pregrouped item. When using pregrouped materials, students should reflect on the ten-to-one relationships in the materials, such as the "tenness" of the rod in base-ten blocks. After many experiences with pregrouped materials, students can use dots and a stick (one tally mark) to record singles and a ten.

Encourage students to use base-ten language to describe quantities between 11 and 19. At the beginning, students do not need use ones for the singles. Some of the base-ten language that is acceptable for describing quantities such as18 includes one ten and eight, a bundle and eight, and a rod and 8 singles. Connect this language to the equation 18 = 10 + 8.

Instructional Resources

Groupable models

Beans and a small cup for 10 beans
Linking cubes
Plastic chain links

Pregrouped materials

Strips (ten connected squares) and squares
Base-ten blocks
Beans and beans sticks (10 beans glued on a craft stick)
Ten-frame

Common Misconceptions

Students have difficulty with ten as a singular word that means ten things. Ten ones make one ten makes students wonder how something that means a lot of things can be one thing. Some students identify the number of tens and ones without understanding. They do not see that there are ten objects represented on the item for ten in pregrouped materials, such as the rod in base-ten blocks. Students then attach words to materials and groups without knowing what they represent. Students need to first use groupable materials to model numbers 11 to 19 because a group of ten such as a bundle or cup makes more sense than a ten in pregrouped materials.

Learning Targets

K.NBT.1.a. Compose numbers from 11-19 from a group of ten ones and additional ones using objects. New 2-12 Number Day

TOPIC: Measurement and Data

Learning Targets

K.MD.3.a. Classify objects into given categories such as size, shape, color, thickness. 1-6, 1-8, 1-11, 2-1, 2-10, 2-15, 2-16

K.MD.3.b. Count the number of objects (10 or less) in each category. New

2011-12 KINDERGARTEN COMMON CORE MATHEMATICS

TOPIC: Geometry

Instructional Strategies

Develop spatial sense by connecting geometric shapes to students' everyday lives and environments. Collect two-and three-dimensional common items to display in the classroom. Students sort items into categories by name or type based on the attributes of the shapes.

Use a shape in different orientations and sizes along with non-examples of the shape so students can learn to focus on defining attributes of the shape.

Identify locations of shapes in the classroom and school using words that describe their position relative to another object. Teacher can use a digital camera to record students' observations.
Example - Hide shapes around the room. In a sentence, describe where you found it (I found a triangle under the chair)
Example - Draw a window ON the door. Draw an apple UNDER the tree. Higher level students could follow 2-3 step directions.

Instructional Resources

From the International Reading Association and the National Council of Teachers of English: Going on a Shape Hunt: Integrating Math and Literacy
http://www.readwritethink.org/classroom-resources/lesson-plans/going-shape-hunt-integrating-776.html?tab=4#session1
In this unit, students are introduced to the idea of shapes through a read-aloud session with an appropriate book. They then use models to learn the names of shapes, work together and individually to locate shapes in their real-world environment.

From the National Council of Teachers of Mathematics: Investigating Shapes (Triangles)
http://illuminations.nctm.org/LessonDetail.aspx?ID=L84
Students will identify and construct triangles using multiple representations in this unit.

From the National Council of Teachers of Mathematics: I've Seen That Shape Before
http://illuminations.nctm.org/LessonDetail.aspx?ID=L237
Students will learn the names of solid geometric shapes and explore their properties at various centers or during multiple lessons.

Common two- and three-dimensional items Digital camera
Two-dimensional shapes (pattern blocks, die cuts, tangrams)
Three-dimensional shapes (models)

Common Misconceptions

A square is separate from a rectangle
If the size or the orientation of a shape changes, then the shape itself changes
Two-dimensional shapes that appear to be part of a three-dimensional shape are used for the name of the three-dimensional shape
Example - a cube is called a square - sphere is called a circle

Connections

K.MD.3; K.G.4; K.G.5; K.G.6

Learning Targets

K.G.1.a. Identify and name the following shapes: squares, circles, triangles, rectangles, hexagons.
K.G.1.b. Describe objects in the environment using names of shapes (two-dimensional).
K.G.1.c. Describe the relative position of objects using appropriate vocabulary, including above, below, beside, in front of, behind, next to.
K.G.2. Name shapes regardless of their orientation or overall size. New
K.G.4.a. Describe two-dimensional shapes to identify their various attributes, including vertices, sides, corners, and length of sides. New
K.G.5.a. Draw shapes to represent objects in the world. New

UNIT: Quarter 2 -- 45 Day(s)

Sample Big Ideas

Students will understand that we use numbers in a variety of ways to make sense of our world.
Students will understand that we use tens to organize and represent bigger numbers.
Students will understand that we can describe some attributes of objects using numbers.

Mathematics K CCSS Alignment Step II

- Common Core State Standards
- http://dc.doe.in.gov/Standards/AcademicStandards/index.shtml
  - Link to the IDOE Academic Standards
  - Standards Print Library
- http://www.doe.in.gov/commoncore/
  - Link to the IDOE Common Core Standards Information

Mathematics K CCSS Alignment Step III

- Modifying VCSC Math Pacing Guide
- Developing VCSC Math Pacing Guide Detail

- www.vigoschools.org/math
  - Math resources for teachers, students, and parents
  - EM resources
  - Pacing Guide resources

ELA

Design and Organization

- Four strands
  - Reading
  - Writing
  - Speaking and Listening
  - Language

An integrated model of literacy – focused on thinking and meaning making

Media requirements and 21st Century Skills are blended throughout

ELA

ELA key advances

- Reading
  - Balance of literature and informational texts
  - Text complexity
- Writing
  - Emphasis on argument and information/explanatory writing
  - Writing about sources
- Standards for reading and writing in history/social studies, science and technical subjects
  - Complement rather than replace content standards in those subjects
  - Responsibility of teachers in those subjects

ELA

"Habits of Mind" fostered by the CCSS

- Demonstrate independence
- Build strong content knowledge
- Respond to the varying demands of audience, task, purpose and discipline
- Comprehend as well as critique
- Value evidence
- Use technology and digital media strategically and capably
- Come to understand other perspectives and cultures

Reading Standards for History/Social Studies, Science, and Technical Subjects

- Knowledge of domain-specific vocabulary
  - **All content areas currently utilize content/domain specific vocabulary in order to aid students in comprehension**
- Analyze, evaluate, and differentiate primary and secondary sources
- Synthesize quantitative and technical information, including facts presented in maps, timelines, flowcharts, or diagrams
  - All content areas ask students to engage in learning through these avenues
- Intentional and explicit instruction for students as they interact with discipline-specific text
  - No longer "Reading Across the Curriculum" but reading within each discipline.

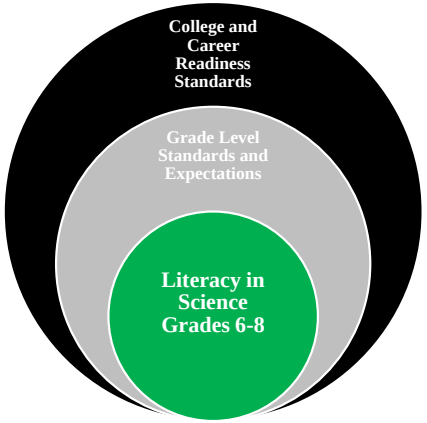
Writing Standards for History/Social Studies, Science, and Technical Subjects

- Write arguments on discipline-specific content and informative/explanatory texts
  - No longer "Writing Across the Curriculum" - teaching writing tasks specific to each discipline.
- Make arguments or claims and support those with the use of data, evidence, and reason
- Apply domain-specific vocabulary through writing exercises unique to each discipline

Middle and High School Literacy Standards

- www.vigoschools.org/science
  - Science resources for teachers, students, and parents
  - Pacing Guide resources
    - Literacy Standards are Included into the Course Syllabus

Reading and Writing Standards for Literacy in Science: Grades 6-8



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Date	Chapter.Section	Standard	Standard - Bold word emphasized in this lesson
First Trimester			
Biology I-1 - Chapter 1 - Biology in the 21st Century			
	1.1 The Study of Life	NOS.9	Recognize that new **scientific discoveries** often lead to a re-evaluation of previously accepted **scientific knowledge** and of **commonly held ideas**. ****
	1.2 Unifying Themes of Biology	NOS.8	Explain that the body of scientific knowledge is **organized into major theories**, which are derived from and supported by the results of many experiments and allow us to make testable predictions. *****
	1.3 Scientific Thinking and Processes	NOS.8	Explain that the body of scientific knowledge is organized into major theories, which are derived from and supported by the results of many experiments and allow us to make testable predictions. *****
		NOS.9	Recognize that new scientific discoveries often lead to a **re-evaluation** of previously accepted scientific knowledge and of commonly held ideas. *****
	1.4 Biologists' Tools and Technology	NOS.10	Describe how scientific discoveries lead to the **development of new technologies** and conversely how **technological advances** can lead to scientific discoveries through new experimental methods and equipment. ****
	1.5 Biology and Your Future	NOS.11	Explain how scientific knowledge can be used to **guide decisions on environmental and social issues**. *****
	Literacy Standards Covered		
	Lesson_____		
	Lesson_____		
	Lesson_____		
	Suggested Supplemental Activities		
Date	Chapter.Section	Standard	Standard - Bold word emphasized in this lesson
First Trimester			
Biology I-1 - Chapter 2 - Chemistry of Life			
	2.1 Atoms, Ions, and Molecules	B.1.1	Describe the structure of the major categories of organic compounds that make up living organisms in terms of their building blocks and the small number of chemical elements (i.e., carbon, hydrogen, nitrogen, oxygen, phosphorous and sulfur) from which they are composed. ***

Date	Chapter.Section	Standard	Standard - Bold word emphasized in this lesson

First Trimester

Biology I-1 - Chapter 2 - Chemistry of Life			
	2.3 Carbon-Based Molecules	B.1.1	Describe the structure of the major categories of organic compounds that make up living organisms in terms of their building blocks and the small number of **chemical elements (i.e., carbon, hydrogen, nitrogen, oxygen, phosphorous and sulfur)** from which they are composed. ****
	2.4 Chemical Reactions	B.3.3	Recognize and describe that **metabolism consists of all of the biochemical reactions** that occur inside cells, which include the production, modification, transport, and exchange of materials that are required for the maintenance of life. ****
	2.5 Enzymes	B.1.2	Understand that the shape of a molecule determines **its role in the many different types of cellular processes** (e.g., metabolism, homeostasis, growth and development, and heredity) and understand that the majority of these processes involve **proteins that act as enzymes**. *****
		B.5.4	Explain how the **unique shape and activity of each protein** is determined by the sequence of its amino acids. *****

Literacy Standards Covered		
Lesson__2.3_____	**9-10.RS.1**	Cite specific textual evidence to support analysis of science texts, attending to the precise details of explanations or descriptions.
Lesson___2.5____	**9-10.RS.4**	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific context relevant to *grades 9-10 texts and topics*.
Lesson_____		
Suggested Supplemental Activities		