Fall Semester Overview

Weeks 1-3

Content focus: What is biology?
READI practice focus: Building classroom routines to support science literacy and meaning-making

Students begin to see text as a part of scientific practice, and that scientific knowledge is built both through close reading of text and through class-wide, knowledge-building discourse. Students begin to see themselves as readers of science, increasingly interact with texts, and view the classroom as a place where their knowledge is valued. To do this, teachers and students:

- Establish norms for sense-making in science through reading, writing and talking (small group and whole class).
- Begin using talk stems as scaffolds for talking, responding, and following up on one another's ideas in ways that support science knowledge-building.
- Introduce and practice routines for metacognitive conversation about science reading. Discussions support sense-making and meta-comprehension of texts.
- Build practices of posing questions about texts, surfacing prior knowledge, noticing and handling roadblocks, and modeling construction while reading.
- Develop dispositions about scientific knowledge as being conjectural and revisable, as one gains more information through text and investigations.
- Utilize texts with multiple levels of difficulty, supporting a variety of learning goals.
- Students engage in ongoing reflection on their science reader identity: preferences, accomplishments, challenges, goals, etc.
- READI provides seven recommended texts.

Weeks 4-7

Content focus: Cell biology
READI practice focus: Building a repertoire of literacy and discourse practices

Text is increasingly used as a way to deepen students' understanding of scientific phenomena. Attention is given to the kinds of evidence that are embedded in various text types (written, visual/representations), the kinds of interpretations one can make given this evidence, and how this helps students construct explanations for scientific phenomena. Students utilize a READI science module to build knowledge of the conventions of scientific models; the criterion for evaluating scientific models is the curricular foundation of these weeks. Students' awareness, confidence, and ownership of science reading and reasoning practices grows. To accomplish this, teachers and students:

- Build the practice of previewing texts to set purpose and strategize ways to tackle challenges.
- Investigate how to handle roadblocks in science reading, practice handling roadblocks, establish that confusion is cool.
- Engage students in questioning while reading science text. Model and practice to extend the range of questioning (pushing beyond *"I wonder about"* or *"What is…?"* to *"How do they know?"*, *"How does it work?"* and *"Why does that happen?"*) and digging in to answer one's own questions.
- Use evidence and interpretation (E/I) charts to help make sense of text, to differentiate evidence and interpretation, and to build knowledge.
- Look at a variety of visual representations in science, including both examples and non-examples of scientific models, to establish purposes/processes for reading models and criteria for evaluating models.
- Develop dispositions towards scientific models as critical texts used to engage in scientific practice — to raise questions, to make sense of one's own understanding, and to provide an explanatory account.
- Utilize texts with multiple levels of difficulty, supporting a single learning goal (in cell biology) including models.
- READI provides six recommended texts and the READI Reading Science Models module.

Weeks 8-11

Content focus: Homeostasis
READI practice focus: Deepening scientific literacy and discourse practices for reasoned sense-making

Students dig into a READI science module to continue building the practices of close reading and multiple-text synthesis for the purpose of developing a causal explanatory account for scientific phenomena. Students take an active role in building explanations of scientific phenomena in the world and increasingly view models as representations that facilitate their own sense-making activities: to clarify, refine, and modify or revise their own science thinking. To do this, teachers and students:

- Build the practice of self-assessment of text comprehension based on the criterion "Have I understood it well enough to inform my understanding of the phenomenon?"
- Build the practice of evaluating quality and coherence of one's own understanding of science phenomena given the best available evidence and based on criteria for science explanation.
- Utilize students' annotations of or responses to science texts to co-construct inquiry questions that drive further reading and reasoning about a science phenomena.
- Engage in cycles of constructing, revising, and coming to consensus on explanations of scientific phenomena, given the available texts and drawing on criteria for scientific models developed in prior weeks.
- Using Evidence-Interpretation Notetakers, investigate how to read to identify evidence, looking specifically for fit between "important ideas" and addressing the driving question.
- Investigate ways of representing models and explanations of science phenomena, exploring affordances of particular visuals and word choices.
- Investigate how to synthesize evidence from multiple texts to explain a science phenomenon.
- Utilize peer review of student-constructed models to make explicit the criteria for science explanations and scientific argumentation.
- READI provides the Homeostasis Module in Weeks 8-11 which includes student Interactive Notebook, student text set (reader), supporting teacher materials.

Weeks 12-16

Content focus: Natural selection and evolution
READI practice focus: Utilizing scientific literacy and discourse practices for disciplinary knowledge-building

Students utilize a READI science module to deepen close reading and multiple text synthesis for the purpose of constructing, justifying, and critiquing causal explanatory accounts for scientific phenomena. Students work more independently in building explanations of scientific phenomena in the world, as well as taking an active role in justification and critique of scientific explanations. To do this, teachers and students:

- Engage in close reading practices, including annotations and multiple text synthesis with a particular eye towards how these texts help students develop causal explanations for scientific phenomena and courses of action.
- Utilize the inquiry practice of documenting in-text evidence and interpretations, attending to what counts as evidence and how that evidence helps address the driving question for the module.
- Engage in cycles of constructing, critiquing, justifying, and revising explanations of scientific phenomena, given the available texts and drawing on criteria for scientific models.
- Utilize evidence and explanatory texts as ways to argue for or against alternative explanations or courses of action.
- Build the practice of using models as testable tools to make predictions about "what will happen next" and what further evidence is needed to verify or add increasing specificity to the model.
- Develop dispositions of science as a problem-solving endeavor, one in which decisions and models are based on best available evidence from a variety of text sources.
- READI provides the Evolution Science Module in Weeks 12-16 which includes: student Interactive Notebook, student text set (reader), supporting teacher materials.

Common Core State Standards	Weeks 1-3	Weeks 4-7	Weeks 8-12	Weeks 13-17
Reading Standards for Literacy in Science and Technical Subjects (Grades 9-10 students)				
Key Ideas and Details				
1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.	✓	✓	✓	✓
2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.	✓	✓	✓	✓
3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		✓	✓	✓
Craft and Structure				
4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9-10 texts and topics.*	✓	✓	✓	✓
5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*).		✓	✓	✓
6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.		✓	✓	✓
Integration of Knowledge and Ideas				
7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.		✓	✓	✓
8. Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.			✓	✓
9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.		✓	✓	✓
Range of Reading and Level of Text Complexity				
10. By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.				✓

Common Core State Standards	Weeks 1-3	Weeks 4-7	Weeks 8-12	Weeks 13-17
Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects (Grades 9-10 students)				
Text Types and Purposes				
1. Write arguments focused on *discipline-specific content.* (sub-points omitted)			✓	✓
2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. (sub-points omitted)			✓	✓
3. Not applicable as a separate requirement				
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.			✓	✓
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant.				
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.				
Research to Build and Present Knowledge				
7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.			✓	✓
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches electively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.		✓	✓	✓
9. Draw evidence from informational texts to support analysis, reflection, and research.		✓	✓	✓
Range of Writing				
10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	✓	✓	✓	✓

Common Core State Standards	Weeks 1-3	Weeks 4-7	Weeks 8-12	Weeks 13-17
College and Career Readiness Anchor Standards for Speaking and Listening (Grades 9-10 students)				
Comprehension and Collaboration				
1. Initiate and participate electively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9-10 topics, texts, and issues,* building on others' ideas and expressing their own clearly and persuasively. (sub-points omitted)	✓	✓	✓	✓
2. Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.	✓	✓	✓	✓
3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence.	✓	✓	✓	✓
Presentation of Knowledge and Ideas				
4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.			✓	✓
5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.			✓	✓
6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grades 9-10 Language standards 1 and 3 on pages 54 for specific expectations.)	✓	✓	✓	✓

PROJECT READi **SCIENCE FALL SEMESTER STANDARDS ANALYSIS**

Next Generation Science Standards	Weeks 1-3	Weeks 4-7	Weeks 8-12	Weeks 13-17
Science and Engineering Practices				
1. Asking questions and defining problems	✓	✓	✓	✓
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 and designing solutions			✓	✓
7. Engaging in argument from evidence		✓	✓	✓
8. Obtaining, evaluating and communicating information	✓	✓	✓	✓
Cross-Cutting Concepts				
1. Patterns	✓			
2. Causes & 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	✓	✓	✓	✓
Disciplinary Core Ideas				
HS-LS 1A: Structure and function	✓	✓	✓	
HS LS 1B: Growth and development of organisms	✓			
HS-LS 1C: Organization for matter and energy flow in organism		✓		
HS-LS 1D: Information processing			✓	
HS LS 2C: Ecosystem dynamics, functioning and resilience	✓			
HS-LS 2B: Cycles of matter and energy transfer in ecosystems		✓		
HS LS 3A: Inheritance of traits	✓			
HS LS 4A: Evidence of common ancestry and diversity	✓			
HS-LS 4B: Natural Selection				✓
HS-LS 4C: Adaptation				✓
HS-LS 4D: Biodiversity and humans				✓
HS-ETS 1A: Defining and delimiting engineering problems			✓	✓
HS-ETS 1B: Developing possible solutions				✓