**CIS:** *Food Science (Agriscience, Business Culinary Arts, Health Sciences, Information Technology, Marketing, Manufacturing,)*

**NGOSS Benchmarks:**

**Agriscience** (Any program using Agriscience Foundations 1, Food Science Applications)

* 1. Analyze the impact of agriculture on the local, state, national and global economy.

02.03 Evaluate the food safety responsibilities that occur along the food supply chain.

13.06 Describe the challenges associated with distributing perishable products.

15.01 Analyze the influence of culture on American food preferences

**Business** (Customer Assistance Technology, Introduction to Information Technology)

05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g.,

time management, productivity, total quality management).

**Hospitality and Tourism** (Culinary Arts)

13.02 List physical, psychological, cultural, and environmental influences on food likes and dislikes.

13.03 Compare and analyze reasons for evaluating food products subjectively and objectively.

28.01 Identify the physical and chemical changes in foods that result from the application of heat or cold.

[**Engineering & Technology Education**](http://www.fldoe.org/workforce/dwdframe/eng_tech_frame13.asp) (Engineering Technology)

* 1. Identify systems thinking logic and creativity with appropriate compromises in complex real-life problems.

02.03 Identify resources involving trade-offs between competing values, such as availability, cost, desirability, and waste.

**Health Science** (Biomedical Sciences)

07.03 Describe that food is made of molecules and macromolecules which in turn are made of atoms.

55.01 Critique science data presented in popular media and compare this with data presented in scientific

Journals

**Information Technology** (Any Program using Introduction to Information Technology)

05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g.,

time management, productivity, total quality management).

**Manufacturing** (Automation and Production Technology)

01.02 Discuss and evaluate current technological developments that are/were driven by profit motive and the

market.

01.03 Identify new technologies that create new processes.

04.05 Identify the criteria and constraints of a product or system and determine how they affect the final

design and development.

01.05 Identify and compare resources involving trade-offs between competing values, such as availability, cost,

desirability, and waste

**Marketing** (Marketing)

10.02 Explain importance and techniques of offering the right merchandising blend.

11.05 Discuss importance of meeting specialized sales needs.

18.05 Demonstrate awareness of impact of both current and emerging technology on life-roles, life-styles,

careers, and marketing occupations.

18.06 Explain product and service quality as applicable to grades and industry standards.

21.01 Explain the concepts and strategies needed to communicate information about products, services,

images, and/or ideas to achieve a desired outcome.

**Title of Text/Article: Researchers explain how food packaging that provides visibility can reduce shelf life**

**Teacher Notes:**

* Materials:
  + Text or article (of sufficient complexity to promote high-level thinking)
  + Sticky notes (for opening “hook question, question generation, written responses, etc.)
  + Chart paper
  + Markers, rubrics (for Text-Based Discussion, Student Written Responses, Question Generation, etc.)
  + Student copies of worksheets (for Written Responses, Direct Note-Taking, and Question Generation).
* Preparations:
  + Number paragraphs of selected text/article for ease of locating text evidence during discussions.
  + Develop and display Final/Complex Text-Based Question at the beginning of the lesson to communicate upfront for students the lesson’s final question and learning outcome.
  + Text-marking: Develop and display a code system appropriate for the CIS text to use in text-marking. Select a small text segment and preplan corresponding coding example(s) to model the text-marking process for students.
  + Directed Note-taking: Develop a graphic organizer with headings appropriate for the CIS text. Select a small text segment and preplan corresponding note(s) to model the note-taking process.
  + Question Generation: Select a small text segment and preplan a corresponding question(s) to model the Question Generation process for students.
  + Any audio visuals, specimens, and/or samples to enhance lesson.
* Guidelines:
  + Add additional efferent discussion sessions, as needed.
  + The C.I.S. Model can last 3 days or longer. (Short texts can take less time; long texts, more time)
  + Schedule a C.I.S .lesson periodically (approximately every 3-4 weeks).

## \* \* \* CIS Step 1 \* \* \*

**Tasks:** Teacher asks hook question to launch opening discussion, reads aloud to students while students mark text, students read the text and participate in directed note-taking.

**Purpose:** To bring world relevance to text reading, establish a purpose for reading, model fluent reading, provide opportunities for students to become interactive with the text, and think critically about information in the text.

**Hook Question: What kind of food “catches your eye”? Are graphic designers responsible for food safety?**

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| **Predictive Written Response to Complex Text-Based Question**  Predict how packaging affects food quality. |
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**Vocabulary Instruction**

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| --- | --- | --- | --- | --- | --- |
| **Para-graph #** | **Academic or Discipline Specific Vocabulary** | **Word Part or Context** | **Para-graph #** | **Academic or Discipline Specific Vocabulary** | **Word Part or Context** |
| 1 | Packaging - a container, as a box or case, in [which](http://dictionary.reference.com/browse/which) something is or may be [packed](http://dictionary.reference.com/browse/packed).  to design and manufacture a package for | Word Part | 3 | Riboflavin | Word Part |
| 1 | Remedy New ideas for plastics may help remedy that problem | Context | 5 | Sedimentation  Sed – to settle  Ment - A result, object, or agent of an action | Word Part |
| 2 | wavelengths |  | 6 | Iridescent | Con-text |
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* Direct students to locate words introduced in the text by paragraph number.
* Model for students how to derive word meaning(s) from word parts (prefix, root, suffix) and/or context. Record meanings of word parts and words on chart paper.
* Variations for Vocabulary Instruction:
  + record meanings of word parts and words in word study guide, journal writing, graphic organizers, etc.
  + post word parts, words, and their meanings on a vocabulary word wall; refer to word wall during reading, discussions, and writing throughout CIS lesson and subsequent lessons.

## Reading #1

**Text-marking**

P – this section of text shows a Problem (loss of food quality)

S – this section of text shows a Solution (Better packaging/food quality)

N – Neutral – neither a problem or a solution

* Model for students by reading the text aloud and coding a portion of the text. Students follow along and mark their copy. Students proceed to code the rest of the text independently. Students share text markings with table group or partner.

## Reading #2

**Directed Note-Taking** - Record notes containing the most important information relevant to the guiding question

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| --- | --- | --- | --- | --- |
| **Directed Note Taking: Researchers explain how food packaging that provides visibility can reduce shelf life** | | | | |
| **Guiding Question:** How does packaging designs effect the quality of food? | | | | |
| **Para-**  **graph #** | **NOTES** | **Check relevant categories below** | | |
| **Factors negatively affecting food quality** | **Factors positively**  **affecting food quality** | **Strictly Informational** |
| **1** | As a consumer you may like clear packaging, but it is bad for food. |  |  | **x** |
| **3** | UV light that damages light can also damage food | x |  |  |
| **5** | UV absorbers helped but weren’t as effective as opaque packaging however, consumers like to see the product | x | x |  |
| **6** | Researchers have tested many new materials, translucent sleeves were an improvement, but still not as good as opaque |  | x |  |
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* Present a guiding question to direct students thinking while taking notes. Teacher models note-taking using an example statement from the text, then selecting the category or categories that support the statement. Students complete note-taking collaboratively or independently.
* Conduct small- and whole-group efferent discussion. Ask groups to come to consensus on which category is the most impactful according to the support from the text.

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| **First Draft Written Response to Essential Question**  According to the text, what are the **primary factors that can cause a** reduction of shelf life? |
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* Ask students to complete the second Written Response.
* Variations for this Written Response: Sticky notes quick writes, collaborative partners, written conversations

## \* \* \* CIS Step 2 \* \* \*

**Tasks:** Teacher models the generation of a complex question based on a section of text, relating to a broad perspective or issue. Students record the questions, and then students re-read the text to generate their own questions.

**Purpose:** To provide students with a demonstration of question generation and the opportunity for them to interact with the text by generating questions to further deepen their comprehension.

## Reading #3

**Question Generation**

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| **Question Generation:** Researchers explain how food packaging that provides visibility can reduce shelf life | | | | |
| **Para-**  **graph #** | **Questions** | **Check relevant categories below** | | |
| **Factors negatively affecting food quality** | **Factors positively**  **affecting food quality** | **Strictly Informational** |
| **1** | Does it cost more to use “solid” packaging? | x | x |  |
| **6** | Has someone done research to know consumer preference? |  | x |  |
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* Teacher models re-reading a portion of the text and generates one or two questions.
* Students continue to review/scan the text and use their recorded notes to generate questions about information in the text collaboratively or independently.
* To conclude question generation, the teacher has students:
  + share their questions with the related category whole class and discuss which questions they have in common, and which questions are most relevant or significant to their learning.
  + record/post common and relevant/significant questions to encourage:
* extended efferent text discussion
* students to seek/locate answers in text-reading throughout the remainder of the chapter/unit focusing on unanswered questions in collaborative inquiry.

## \* \* \* CIS Step 3 \* \* \*

**Task:** Teacher posts a Complex Text-Based question, students discuss answers, and review/revise answers to the final/Complex Text-Based question based on discussion.

**Purpose:** To provide opportunities for students to interact with the text and with their peers to:

* Identify text information most significant to the final/essential question.
* Facilitate complex thinking and deep comprehension of text.

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| **Final Written Response to Complex Text-Based Question** How can designers create attractive and effective food packaging that preserves the food quality?  According to the text… |
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* The Final Written Response can be used as an assessment for student learning, aligning to FCAT Item Specifications.