



**Literacy Design  
Collaborative**

# Cryobiology

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Students have just finished units on States and Properties of Matter. They will take the concepts learned and expound upon them by examining the field of cryobiology. Cryobiology is the study of living things at very low temperatures. This science is filled with many technological advances. Students will examine the pros and cons of the techniques used and formulate an argument based on scientific facts.

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GRADES

**7 - 12**

DISCIPLINE

 **Science**

COURSE

**Any**

# *Section 1: What Task?*

## ***Teaching Task***

### ***Task Template 2 - Argumentation***

Should cryobiology techniques be used to preserve living matter for future use? After reading texts on cryobiology, write an essay in which you address the question and argue if this technique should be used to preserve living matter for future use. Support your position with evidence from the text(s).

## ***Standards***

***Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects***

**CCR.R.1**

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

**CCR.R.2**

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

**CCR.R.4**

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

**CCR.R.10**

Read and comprehend complex literary and informational texts independently and proficiently.

**CCR.W.1**

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

**CCR.W.4**

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

**CCR.W.5**

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

**CCR.W.9**

Draw evidence from literary or informational texts to support analysis, reflection, and research.

**CCR.W.10**

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

***Texts***



Immortality on Ice

Immortality on Ice. Discovery Channel Video, 1996. Videocassette.



Cryobiology

“Cryobiology.” World of Invention. Thomson, Gale, 2005-2006. BookRags. Web.



The World of Absolute Zero

The World of Absolute Zero: Films for the Humanities & Sciences, Inc. Videocassette.



**Resources**

🔗 **Cryobiology 1350 Lexile**

🔗 **Cryobiology Lexile 1250**

🔗 **Freezing for the Future Life Saving Cryobiology**

## LDC Student Work Rubric - Argumentation

	Not Yet	Approaches Expectations	Meets Expectations	Advanced
	1	2	3	4
<b>Focus</b>	Attempts to address prompt, but lacks focus or is off-task.	Addresses prompt appropriately and establishes a position, but focus is uneven. D: Addresses additional demands superficially.	Addresses prompt appropriately and maintains a clear, steady focus. Provides a generally convincing position. D: Addresses additional demands sufficiently	Addresses all aspects of prompt appropriately with a consistently strong focus and convincing position. D: Addresses additional demands with thoroughness and makes a connection to claim.
<b>Controlling Idea</b>	Attempts to establish a claim, but lacks a clear purpose.	Establishes a claim.	Establishes a credible claim.	Establishes and maintains a substantive and credible claim or proposal.
<b>Reading/Research</b>	Attempts to reference reading materials to develop response, but lacks connections or relevance to the purpose of the prompt.	Presents information from reading materials relevant to the purpose of the prompt with minor lapses in accuracy or completeness.	Accurately presents details from reading materials relevant to the purpose of the prompt to develop argument or claim.	Accurately and effectively presents important details from reading materials to develop argument or claim.
<b>Development</b>	Attempts to provide details in response to the prompt, but lacks sufficient development or relevance to the purpose of the prompt.	Presents appropriate details to support and develop the focus, controlling idea, or claim, with minor lapses in the reasoning, examples, or explanations.	Presents appropriate and sufficient details to support and develop the focus, controlling idea, or claim.	Presents thorough and detailed information to effectively support and develop the focus, controlling idea, or claim.
<b>Organization</b>	Attempts to organize ideas, but lacks control of structure.	Uses an appropriate organizational structure for development of reasoning and logic, with minor lapses in structure and/or coherence.	Maintains an appropriate organizational structure to address specific requirements of the prompt. Structure reveals the reasoning and logic of the argument.	Maintains an organizational structure that intentionally and effectively enhances the presentation of information as required by the specific prompt. Structure enhances development of the reasoning and logic of the argument.
<b>Conventions</b>	Attempts to demonstrate standard English conventions, but lacks cohesion and control of grammar, usage, and mechanics. Sources are used without citation.	Demonstrates an uneven command of standard English conventions and cohesion. Uses language and tone with some inaccurate, inappropriate, or uneven features. Inconsistently cites sources.	Demonstrates a command of standard English conventions and cohesion, with few errors. Response includes language and tone appropriate to the audience, purpose, and specific requirements of the prompt. Cites sources using appropriate format with only minor errors.	Demonstrates and maintains a well-developed command of standard English conventions and cohesion, with few errors. Response includes language and tone consistently appropriate to the audience, purpose, and specific requirements of the prompt. Consistently cites sources using appropriate format.
<b>Content Understanding</b>	Attempts to include disciplinary content in argument, but understanding of content is weak; content is irrelevant, inappropriate, or inaccurate.	Briefly notes disciplinary content relevant to the prompt; shows basic or uneven understanding of content; minor errors in explanation.	Accurately presents disciplinary content relevant to the prompt with sufficient explanations that demonstrate understanding.	Integrates relevant and accurate disciplinary content with thorough explanations that demonstrate in-depth understanding.

## ***Background for Students***

You have just finished units on States and Properties of Matter. You will now take the concepts learned and expound upon them by examining the field of cryobiology. This science is filled with many technological advances. You will examine the pros and cons of the techniques used and formulate an argument based on scientific facts.

## ***Extension***

Not provided

## *Section 2: What Skills?*

### ***Preparing for the Task***

**TASK ENGAGEMENT:** Ability to connect the task and new content to existing knowledge, skills, experiences, interests, and concerns

**TASK AND RUBRIC ANALYSIS > TASK ANALYSIS:** Ability to understand and explain the task's prompt and rubric.

### ***Reading Process***

**PRE-READING > TEXT SELECTION:** Ability to identify appropriate texts.

**ACTIVE READING:** Ability to identify the central point and main supporting elements of a text.

**ACTIVE READING > ESSENTIAL VOCABULARY:** Ability to identify and master terms essential to understanding a text.

**POST-READING > ACADEMIC INTEGRITY:** Ability to use and credit sources appropriately.

**ACTIVE READING > NOTE-TAKING:** Ability to select important facts and passages for use in one's own writing.

### ***Transition to Writing***

**BRIDGING CONVERSATION > PREPARING FOR WRITING:** Ability to begin linking reading results to writing task.

### ***Writing Process***

**INITIATION OF TASK > ESTABLISHING THE CONTROLLING IDEA:** Ability to establish a claim and consolidate information relevant to task.

**PLANNING > PLANNING THE WRITING:** Ability to develop a line of thought and text structure appropriate to an argumentation task.

**DEVELOPMENT > BODY PARAGRAPHS:** Ability to construct an initial draft with an emerging line of thought and structure.

**REVISION, EDITING, AND COMPLETION > REVISION:** Ability to refine text, including line of thought, language usage, and tone as appropriate to audience and purpose.

**REVISION:** Ability to proofread and format a piece to make it more effective.

**REVISION, EDITING, AND COMPLETION > FINAL DRAFT:** Ability to submit final piece that meets expectations.

## Section 3: What Instruction?

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
<b>Preparing for the Task</b>				
Not provided	<b>TASK ENGAGEMENT:</b> Ability to connect the task and new content to existing knowledge, skills, experiences, interests, and concerns	<b>SHORT CONSTRUCTED RESPONSE</b> In a quick write, write your first reaction to the task prompt. Prompt: Mr. Kimmel is considering cryonic preservation when he passes away. Write a letter to him that advises him what to do. Be sure to explain why you think he should or should not be cryonically preserved.	No scoring	* Teach or review content required for the task depending on when in the sequence they teach the content - before or during the production of the task.
Not provided	<b>TASK AND RUBRIC ANALYSIS &gt; TASK ANALYSIS:</b> Ability to understand and explain the task's prompt and rubric.	<b>LIST</b> In your own words, write a brief explanation of what you need to carry out the task.	No scoring	* Share examples of type of text students will produce (either from past students or from professional writers). * Identify or invite students to identify key features of examples. * Pair students to share and improve their individual bullets. * Create a classroom list: Choose one student to share a few ideas on the board, and ask other to add to it.
<b>Reading Process</b>				
Not provided	<b>PRE-READING &gt; TEXT SELECTION:</b> Ability to identify appropriate texts.	<b>NOTES</b> *Use "Talking to the Text" strategy to understand the texts. *Identify text structure of the articles.	Demonstrated active reading using annotation.	*Teacher will guide reading for first reading selection. *Students will use a variety of active reading strategies with appropriate support for the remaining selections. *Teacher uses group discussion to extend thinking. *Teacher reinforces active reading techniques throughout student readings by having students demonstrate processes using the interactive white board. *See handout "Directions for Reading and Taking Notes on the Articles".
Not provided	<b>PRE-READING &gt; TEXT SELECTION:</b> Ability to identify appropriate texts.	<b>NOTES</b> For each text, list the needed bibliographic information. Add bullets on why you think the work is credible and/or worthy of study.	* Identifies author, title, publisher, date, and any other needed information (for example, the volume for a periodical or the editor for an anthology). * Includes reasonable evidence that work is credible and/or worthy of study.	* Provide citation guide and discuss why each element of citation is needed. * Ask students to brainstorm what makes an author credible and/or worthy of study. * Provide access to research sources for students to assess the texts. * Note: for an "after researching" task, add teaching and time for students to select the texts they will use.



PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
Not provided	<b>ACTIVE READING:</b> Ability to identify the central point and main supporting elements of a text.	<b>SHORT CONSTRUCTED RESPONSE</b> What is the author trying to accomplish? Which parts of the text show you that? * L2 What competing arguments have you encountered or can you think of? * L3 What historical or current examples can you note that relate to the task prompt?	<ul style="list-style-type: none"> <li>Answers questions with credible response.</li> </ul>	<ul style="list-style-type: none"> <li>Invite students to brainstorm ways to figure out any author's intent.</li> <li>Invite students to share and discuss their answers for each text.</li> <li>After the discussion, allow them to add to their entries.</li> </ul>
Not provided	<b>ACTIVE READING &gt; ESSENTIAL VOCABULARY:</b> Ability to identify and master terms essential to understanding a text.	<b>LIST</b> <ul style="list-style-type: none"> <li>Compare and contrast the terms cryobiology, cryonics, and cryogenics.</li> <li>Using the vocabulary page in the Writer's Notebook, define words in context as you read.</li> </ul>	<ul style="list-style-type: none"> <li>Explain similarities and differences of the terms cryobiology, cryonics, and cryogenics.</li> <li>Identifies vocabulary, phrases and notes their meaning in context of the passage(s).</li> <li>Writes in readable prose.</li> </ul>	<ul style="list-style-type: none"> <li>Use of dictionary and other sources to acquire understanding.</li> <li>Teach strategies for understanding words in context.</li> <li>Introduce language of reading and writing relevant to task.</li> <li>Introduce or review relevant terms used in the discipline (e.g. cryonics, cryobiology, cryogenics).</li> </ul>
Not provided	<b>POST-READING &gt; ACADEMIC INTEGRITY:</b> Ability to use and credit sources appropriately.	<b>SHORT CONSTRUCTED RESPONSE</b> Define "plagiarism" and list ways to avoid it.	<ul style="list-style-type: none"> <li>Provides accurate definition * Lists several appropriate strategies</li> </ul>	<ul style="list-style-type: none"> <li>Discuss respect for others' work to assemble evidence and create texts.</li> <li>Discuss academic penalties for stealing others thoughts and words.</li> </ul>
Not provided	<b>ACTIVE READING &gt; NOTE-TAKING:</b> Ability to select important facts and passages for use in one's own writing.	<b>NOTES</b> <ul style="list-style-type: none"> <li>Using a note taking method, select information (passages, facts, data) relevant to the task.</li> <li>List (bullet) each source and note relevant information. Refer to Writer's Notebook - "Cryobiology - Argumentative Module Notes".</li> <li>List pros and cons of cryobiology techniques.</li> <li>What does "plagiarism" mean and what strategies can you use to avoid it?</li> <li>Complete samples of paraphrasing.</li> </ul>	<ul style="list-style-type: none"> <li>Accomplishes task by defining cryobiology, and listing reasons showing pros and cons for using cryobiology techniques.</li> <li>Answers question about plagiarism correctly and provides appropriate strategies for avoiding it.</li> <li>Paraphrasing of sample information. Writes in readable prose.</li> </ul>	<ul style="list-style-type: none"> <li>Review policy for plagiarism and develop students' understanding of it.</li> <li>Provide students with a note taking method(s) and template. (See "Cryobiology-Argumentative Module Notes" sheet.)</li> <li>Discuss the term "relevant" and what it means to stay on task--two demands embedded in the rubric.</li> <li>Identify any gaps or unanswered questions as you read about your topic.</li> <li>Teach strategies for summarizing or paraphrasing.</li> </ul>

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
Not provided	<b>ACTIVE READING &gt; NOTE-TAKING:</b> Ability to select important facts and passages for use in one's own writing.	<b>NOTES</b> Prioritize relevant information in your notes on which to build your sequence or process.	<ul style="list-style-type: none"> <li>•Provides a prioritized set of notes that connect points for logic structure or line of thought.</li> <li>•Suggests implications drawn from information about the issue or topic.</li> <li>•Writes in readable prose.</li> </ul>	<ul style="list-style-type: none"> <li>•Students organize notes using the "Directions for Reading and Taking Notes on the Articles sheet and teacher feedback.</li> </ul>
<b>Transition to Writing</b>				
Not provided	<b>BRIDGING CONVERSATION &gt; PREPARING FOR WRITING:</b> Ability to begin linking reading results to writing task.	<b>NOTES</b> Following Socratic Seminar guidelines, students explore both sides of the issue.	No scoring	<ul style="list-style-type: none"> <li>•Conduct a value-line exercise to ensure students understand a range of issues or options.</li> <li>•Review guidelines for the Socratic Seminar. (See the Paideia Seminar Manual: "Active Thinking Through Dialogue" for background on how to conduct a seminar.)</li> <li>•Teachers conducts a fishbowl modeling of a mini-Socratic seminar using a common science topic and student volunteers.</li> <li>•Conduct a Socratic Seminar on the prompt's question or key issue or topic. Organize students in small groups to ensure both sides of the issue are represented.</li> <li>•Following the seminar, students evaluate the effectiveness of details and examples to support their claim. Reread and adjust notes as necessary.</li> <li>•Review professional or other samples of writing type and structure.</li> <li>•Deconstruct professional samples of the type of writing students will engage in:               <ul style="list-style-type: none"> <li>-Demonstrates patterns of development (e.g. from most important to least important)</li> <li>-Note the difference between a claim and a controlling idea or thesis</li> <li>-Note the difference between an "explanation" and an "argument"</li> <li>-Analyze purpose and audience</li> <li>-Analyze tones and language choices</li> <li>-Evaluate effectiveness- Do you get the information and explanation you expect? Why?</li> </ul> </li> <li>•Discuss the prompt and what students need to do to complete the writing portion.</li> <li>•Refer to rubric - point out demands and qualities of performance.</li> </ul>
<b>Writing Process</b>				

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
Not provided	<b>INITIATION OF TASK &gt; ESTABLISHING THE CONTROLLING IDEA:</b> Ability to establish a claim and consolidate information relevant to task.	<b>SHORT CONSTRUCTED RESPONSE</b> Write an opening paragraph that includes a controlling idea and sequences the key points you plan to make in your composition	<ul style="list-style-type: none"> <li>Writes a concise summary statement or draft opening. *</li> <li>Provides direct answer to main prompt requirements. *</li> <li>Establishes a controlling idea. *</li> <li>Identifies key points that support development of argument.</li> </ul>	<ul style="list-style-type: none"> <li>Offer several examples of opening paragraphs/thesis statements.</li> <li>Ask class to discuss what makes them strong or weak.</li> <li>Demonstrate how to write an opening paragraph using the template provided on "Brainstorming Article Organizer" sheet found in the "Writer's Notebook".</li> </ul>
Not provided	<b>PLANNING &gt; PLANNING THE WRITING:</b> Ability to develop a line of thought and text structure appropriate to an argumentation task.	<b>OUTLINE</b> Create an outline based on your notes and reading in which you state your claim, sequence your points, and note your supporting evidence.	<ul style="list-style-type: none"> <li>Creates an outline or organizer. *</li> <li>Supports controlling idea. Uses evidence from texts read earlier.</li> <li>Provides citations and references with elements for correct form</li> <li>Draws credible implication from information about an issue or topic</li> <li>Writes in readable prose</li> </ul>	<ul style="list-style-type: none"> <li>Provide and teach one or more examples of outlines or organizers.</li> <li>Invite students to generate questions in pairs about how the format works, and then take and answer questions.</li> </ul>
Not provided	<b>DEVELOPMENT &gt; BODY PARAGRAPHS:</b> Ability to construct an initial draft with an emerging line of thought and structure.	<b>LONG CONSTRUCTED RESPONSE</b> Write an initial draft complete with opening, development, and closing; insert and cite textual evidence.	<ul style="list-style-type: none"> <li>Provides complete draft with all parts. *</li> <li>Supports the opening in the later sections with evidence and citations.</li> </ul>	<ul style="list-style-type: none"> <li>Encourage students to re-read prompt partway through writing, to check that they are on track.</li> <li>Show how to open and end an argumentation composition.</li> <li>Use of template for all levels to guide students through first draft. (Brainstorming Article Organizer)</li> <li>Student-led revision session using "Revising the Rough Draft" in Writer's Notebook</li> </ul>

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
Not provided	<b>REVISION, EDITING, AND COMPLETION &gt;</b> <b>REVISION:</b> Ability to refine text, including line of thought, language usage, and tone as appropriate to audience and purpose.	<b>LONG CONSTRUCTED RESPONSE</b> Refine composition's analysis, logic, and organization of ideas/points. Use textual evidence carefully, with accurate citations. Decide what to include and what not to include.	<ul style="list-style-type: none"> <li>Provides complete draft with all parts. *</li> <li>Supports the opening in the later sections with evidence and citations.</li> <li>Improves earlier edition.</li> <li>Apply a text structure to organize reading material content and to explain key points related to the prompt.</li> <li>Organize a bibliography.</li> </ul>	<ul style="list-style-type: none"> <li>Sample useful feedback that balances support for strengths and clarity about weaknesses.</li> <li>Assign students to provide each other with feedback on those issues.</li> <li>Student-led revision session using "Revising the Rough Draft" in "Writer's Notebook"</li> <li>Peer feedback on clarity of thinking and development of claim/argument</li> <li>Read-aloud for peer and adult feedback</li> <li>Strategies for embedding information - citation methods, quoting, paraphrasing (minimum - one citation per paragraph)</li> </ul>
Not provided	<b>REVISION:</b> Ability to proofread and format a piece to make it more effective.	<b>LONG CONSTRUCTED RESPONSE</b> Revise draft to have sound spelling, capitalization, punctuation, and grammar. Adjust formatting as needed to provide clear, appealing text.	<ul style="list-style-type: none"> <li>Provides draft free from distracting surface errors. * Uses format that supports purpose.</li> </ul>	<ul style="list-style-type: none"> <li>Briefly review selected skills that many students need to improve.</li> <li>Teach a short list of proofreading marks.</li> <li>Assign students to proofread each other's texts a second time.</li> </ul>
Not provided	<b>REVISION, EDITING, AND COMPLETION &gt;</b> <b>FINAL DRAFT:</b> Ability to submit final piece that meets expectations.	<b>LONG CONSTRUCTED RESPONSE</b> Turn in your complete set of drafts, plus the final version of your piece	<ul style="list-style-type: none"> <li>Fits the "Meets Expectations" category in the rubric for the teaching task.</li> </ul>	Not Provided

## Instructional Resources

No resources specified

## *Section 4: What Results?*

### ***Student Work Samples***

#### ***Advanced***



 **Cryobiology Student Work Sample**

#### ***Approaches Expectations***



 **Cryobiology Student Work Sample**

#### ***Not Yet***



 **Cryobiology Student Work Sample**

#### ***Meets Expectations***



 **Cryobiology Student Work Sample**

### ***Teacher Reflection***

Not provided

## ***All Attachments***

-  **Resources : <https://s ldc.org/u/5j0uoanhi0wcpy5jhk65rgrlr>**
-  **Cryobiology 1350 Lexile : <https://s ldc.org/u/1hm7kaapd37r9fgbc7zju0y9i>**
-  **Cryobiology Lexile 1250 : <https://s ldc.org/u/dvtbuwy5k9r4m8cxzb8hq6a51>**
-  **Freezing for the Future Life Saving Cryobiology : <https://s ldc.org/u/2lz3cwvhbky49bm0zt1oist6p>**
-  **Cryobiology Student Work Sample : <https://s ldc.org/u/dmdn080ifg37t304zih7h3qnr>**
-  **Cryobiology Student Work Sample : <https://s ldc.org/u/8hjt59yr77i2e0eev4i82ct3a>**
-  **Cryobiology Student Work Sample : <https://s ldc.org/u/54om0vfihtzkz8hxe4e9hjvv>**
-  **Cryobiology Student Work Sample : <https://s ldc.org/u/7p1e3adh9o9496w1i3omr6mj3>**