



**Literacy Design
Collaborative**

Does the ban on DDT have scientific merit?

★ TASK ★ LADDER

by Katherine L. Bryant

DDT - a pesticide widely used between 1940 and 1960 - was the focus of great controversy. Rachel Carson's book, *Silent Spring*, published in 1962, describes the detrimental effects of DDT. The publication of the book, in part, led to the creation of the Environmental Protection Agency, which later (1972) banned the pesticide in the United States. Today, over 50 years after the publication of *Silent Spring*, many scientists question whether the ban on DDT had scientific merit in 1972 and in the present.

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GRADES

8 - 12

DISCIPLINE

 **Science**

COURSE

 **Physical
Science,
Environmental
Science,
Biology**

PACING

 **N/A**

Section 1: What Task?

Teaching Task

Task Template 6 - Argumentation

Does the ban on DDT have scientific merit? After reading *Silent Spring* and additional informational texts write a letter to the EPA or another environmental agency of your choice that discusses the reasons for the implementation of the ban on DDT and evaluates whether the ban has scientific merit. Be sure to support your position with evidence from the texts.

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.

RST.11-12.3

Focus

Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

WHST.11-12.1

Focus

Write arguments focused on discipline-specific content.

WHST.11-12.4

Focus

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

WHST.11-12.9

Focus

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

Georgia Performance Standards - Microbiology Curriculum

SMI6.c

Describe the importance of microorganisms in global nutrient cycling within both soil, freshwater, and marine habitats.

Georgia Performance Standards - Zoology Curriculum

SCSh7.e

Testing, revising, and occasionally rejecting new and old theories never ends.

SCSh8.b

Focus

Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretations.

- Relate messages and themes from one subject area to messages and themes in another area.

Next Generation Science Standards (NGSS Comprehensive)

HS-ETS1-3.


Focus


Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.


Texts


- 🔗 **The DDT Story.** This article outlines problems with widespread use of DDT. (student)
- 🔗 **DDT-A Brief History.** The EPA website outlines the history of the ban on DDT. (student)
- 🔗 **PARACHUTING CATS AND CRUSHED EGGS** The Controversy Over the Use of DDT to Control


Malaria. This article details the unintended consequences of the use of DDT, as illustrated by the event in Borneo in the 1950's. (student/teacher)

 Silent Spring. Carsen, R. (1962). Silent spring. Greenwich, CT: Fawcett. (student/teacher)
Carsen, R. (1962). Silent spring. Greenwich, CT: Fawcett

 Facts vs. Fears: A Review of the Greatest Unfounded Health Scares of Recent Times. Published by the American Council on Science and Health, this book includes a chapter on the health concerns that led to the ban on DDT. (student)
Published by the American Council on Science and Health, this book includes a chapter on the health concerns that led to the ban on DDT.

 How Rachel Carson Helped Save The Brown Pelican. Lipske, Michael. Dec 1999/Jan 2000. National Wildlife (World Edition).
(Examines the role of the late biologist and author Rachel Carson in the restoration of brown pelican populations in Louisiana. Publications of the book "Silent Spring" in 1962; Near-disappearance of the bird in Louisiana and other coastal states in the 1960s; Pesticide endrin as the prime suspect in pelican extirpation; Carson's criticism of chemical companies and government agencies for their use of toxic pesticides.) - Student Text

 The Destructive Legacy of Rachel Carlson. Jones, Gordon S. 8/26/2002. Human Events
(eatures Rachel Carson, a woman who was responsible for the deaths of people for her production of dichlorodiphenyltrichloroethane (DDT). Issuance of an order by U.S. Environmental Protection Agency Administrator William Ruckelhaus in June 1972 to ban the domestic production of DDT; Decrease in death rate from malaria due to DDT; Effect of DDT on animals.) - Student Text

 DDT Ban Continues to Kill People. Williams, Walter E. 7/19/2004. Human Events.
(Reports on the impact of the dichlorodiphenyltrichloroethane insecticide ban on the health of U.S. citizens. Benefits of the insecticide to humans; Use of the insecticide in preventing malaria; Percentage rate reduction of malaria infections.) - Student Text

Student Work Rubric - Argumentation Task - Grades 9-12

	Emerging	Approaches Expectations	Meets Expectations	Advanced
	1	2	3	4
Controlling Idea	Makes a general claim with an unclear focus.	Establishes a clear claim that addresses the prompt , with an uneven focus .	Establishes and maintains a clear, specific, and credible claim that addresses all aspects of the prompt.	Establishes and maintains a precise, substantive claim that addresses all aspects of the prompt. Acknowledges limitations and/or the complexity of the issue or topic .
Selection & Citation of Evidence	Includes minimal details from sources. Sources are used without citation.	Includes details, examples, and/or quotations from sources that are relevant to the claim . Inconsistently cites sources.	Includes details, examples, and/or quotations from sources that support the claim and supporting ideas . Consistently cites sources with minor formatting errors .	Includes well-chosen details, examples, and/or quotations from sources that fully support the claim and supporting ideas. Consistently cites sources using appropriate format .
Development / Explanation of Sources	Explanation of ideas and source material is irrelevant, incomplete, or inaccurate.	Explains ideas and source material to support the argument , with some incomplete reasoning or explanations .	Accurately explains ideas and source material and how they support the argument.	Thoroughly and accurately explains ideas and source material, using logical reasoning to support and develop the argument.
Organization	Lacks an evident structure. Makes unclear connections among claims, reasons, and/or evidence.	Groups ideas and uses transitions to develop the argument, with some lapses in coherence or organization .	Groups and sequences ideas to develop a cohesive argument . Uses transitions to clarify the relationships among claim(s), reasons, and evidence .	Groups and sequences ideas in a logical progression in which ideas build to create a unified whole . Uses varied transitions to clarify the precise relationships among claim(s), reasons, and evidence.
Conventions	Major errors in standard English conventions interfere with the clarity of the writing. Language or tone is inappropriate.	Errors in standard English conventions sometimes interfere with the clarity of the writing. Uses language and tone that are sometimes inappropriate for the audience and purpose.	Consistently applies standard English conventions; minor errors , while noticeable, do not interfere with the clarity of the writing. Uses language and tone appropriate to the audience and purpose .	Consistently applies standard English conventions, with few errors . Demonstrates varied syntax and precise word choice . Consistently uses language and tone appropriate to the audience and purpose.
Content Understanding (Generic)	Attempts to include disciplinary content in explanation or 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.

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Background for Students

This module would work well with gifted learners at the middle school level. All students at the high school level should be able to successfully complete this module.

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

PRE-READING: Ability to research background information to connect to the task and new content

TASK ANALYSIS: Ability to understand and explain the task's prompt and rubric.

Reading Process

PRE-READING: Ability to identify strategies which are helpful in understanding text.

ACTIVE READING/NOTE-TAKING: Ability to identify the central point and main supporting elements of a text. Ability to read purposefully and select relevant information; to summarize and/or paraphrase.

ACTIVE READING AND NOTE-TAKING: Ability to identify the central point and main supporting elements of a text. Ability to read purposefully and select relevant information; to summarize and/or paraphrase.

Transition to Writing

BRIDGING: Ability to begin linking reading results to writing task.

Writing Process

PLANNING: Ability to develop a line of thought and text structure appropriate to an information/explanation task.

CONTROLLING IDEA: Ability to establish a controlling idea and consolidate information relevant to task.

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


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

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

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

COMPLETION: Ability to submit final piece that meets expectations.

Section 3: What Instruction?

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
Preparing for the Task				
30 mins	TASK ENGAGEMENT: Ability to connect the task and new content to existing knowledge, skills, experiences, interests, and concerns	SHORT CONSTRUCTED RESPONSE In a quick write response, discuss specific examples of political policies influencing scientific research/development and/or scientific research/development influencing political policy. List examples of when it is desirable for science and policy to influence one another.	Student meets expectations if he/she does the following: Student work meets expectation if students are able to identify at least one example of the inter-relationship that exists between political policies and science. Examples could include policies on stem cell research or banned medicines such as Thalidomide.	Discuss student examples. Notes: If possible ask social science teacher to discuss such examples with class, or perhaps go more in depth with the discussion during class.
55 mins	PRE-READING: Ability to research background information to connect to the task and new content	LIST What are the basic facts and background information about DDT? Who developed and used DDT, what is DDT, where was DDT used, when was DDT used, and why was DDT used?	Student meets expectations if he/she does the following: students are able to answer the who, what, where, when and why in regard to the background of DDT.	Students will complete a teacher-developed worksheet to guide their research into background information. Students will record their sources on the teacher developed worksheet. Notes: If desired, have students create a class list of the most important elements of the prompt to post on the wall for the duration of the project.
Additional Attachments:  DDT Information				
Not provided	TASK ANALYSIS: Ability to understand and explain the task's prompt and rubric.	SHORT CONSTRUCTED RESPONSE With your group, read the prompt and rewrite the prompt in your own words. In your version of the prompt, underline or highlight the elements of the prompt that tell you what must be in your letter.	Student meets expectations if he/she does the following: students are able to work collaboratively to discuss and rewrite the prompt in their own words.	In groups of 4-5 students will read the prompt and rewrite the prompt in their own words. Then the class will discuss elements of the prompt identified by each group. Pacing: 30 minutes
Reading Process				
30 mins	PRE-READING: Ability to identify strategies which are helpful in understanding text.	SHORT CONSTRUCTED RESPONSE What strategies do you use to help you understand what you	Student meets expectations if he/she does the following: students are able to identify two strategies	Students will record their individual ideas. Students will then share their ideas with their group. Students will then share their ideas with the class.

		read?	which are helpful in understanding text.	<p>A list of student-recommended strategies will be created and posted in the classroom. Teacher will synthesize the list and give it to students as a handout or bookmark.</p> <p>Notes:</p> <p>As students become more adept at reading the book and finding relevant evidence, chapters may be assigned for homework. If students are reading at home, teachers can use class time to teach other material, but they should regularly check notes in each students' Writer's Notebook and occasionally engage in class discussion of the reading.</p> <p>Accommodations and Interventions:</p> <p>To encourage all students to engage in classroom discussion, teachers can highlight notes in students' notebooks and ask student to share what has been selected. Teachers can draw attention to important ideas from the text while engaging students who may not always volunteer.</p>
Not provided	<p>ACTIVE READING/NOTE-TAKING: Ability to identify the central point and main supporting elements of a text. Ability to read purposefully and select relevant information; to summarize and/or paraphrase.</p>	<p>LIST</p> <p>As you read Silent Spring, record evidence that Carson presents to prove DDT is harmful to the environment and living organisms including people.</p>	<p>Student meets expectations if he/she does the following:</p> <ul style="list-style-type: none"> students include 1-5 specific examples of evidence for each chapter in their writers notebook. 	<p>Instruction for the first chapter ("A Tale for Tomorrow") should be very explicit and include group/partner work and teacher modeling.</p> <ul style="list-style-type: none"> o Teacher reads first chapter, modeling active reading and strategies. o Students finish reading the next chapter using a "think aloud" process with a partner. o Teacher asks for a list of vocabulary that students struggled with and class discusses strategies for understanding words in context. Students record new vocabulary in the Vocabulary Notes section of their Writer's Notebook. <p>•Students actively read the remainder of Silent Spring independently recording evidence of the impact of DDT on the environment and living organisms.</p> <p>Notes:</p> <p>As students become more adept at reading the book and finding relevant evidence, chapters may be assigned for homework. If students are reading at home, teachers can use class time to teach other material, but they should regularly chaco notes in each students' Writer's Notebook and occasionally engage in class discussions on the reading.</p> <p>Accommodations and Interventions:</p> <p>To encourage all students to engage in classroom discussion, teachers can highlight notes in students' notebooks and ask students to share what has been selected. Teachers can draw attention to important ideas from the text while engaging students who may not always volunteer.</p>

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				Pacing: 2 weeks
Not provided	ACTIVE READING AND NOTE-TAKING: Ability to identify the central point and main supporting elements of a text. Ability to read purposefully and select relevant information; to summarize and/or paraphrase.	NOTES What evidence do you see that supports, or does not support the merit for the ban on DDT?	Student meets expectations if he/she does the following: students are able to select and record evidence which supports or does not support the merit for the ban on DDT.	Students read three articles in addition to Silent Spring. These articles include the transcripts from the 1972 hearings on if DDT should be banned, an article written by the World Health Organization regarding benefits of the use of DDT, and lastly an article which is critical of Carson's portrayal of DDT in her book, Silent Spring. Each of these articles has a writer's notebook to go with it. In this writer's notebook students record the evidence from the text regarding the harm/benefit of DDT. Pacing: 2 days
Additional Attachments: <div> DDT BAN CONTINUES TO KILL PEOPLE FACT VS FEARS WRITERS' NOTEBOOK EPA WRITERS' NOTEBOOK Sweeneys Opinion Statement of the Case Findings of Fact 1972 EPA DDT Hearings </div>				
Transition to Writing				
55 mins	BRIDGING: Ability to begin linking reading results to writing task.	SHORT CONSTRUCTED RESPONSE You have been assigned a role to play for a group discussion about the ban on DDT. First, determine the position on DDT that your character would most likely hold. Then examine your notes and list the relevant information and evidence your character would use to argue that position. In a group debate, support your position based on evidence from your research.	Student meets expectations if he/she does the following: students use appropriate evidence from their research to effectively portray the point of view they have been assigned.	Students will be placed in groups of 4-5. Each student will be assigned a point of view (WHO official, Farmer, Environmentalist, or Politician) for a group discussion of the ban on DDT. Pacing: 55 minutes
Writing Process				
30 mins	PLANNING: Ability to develop a line of thought and text structure appropriate to an information/explanation task.	LIST What are the elements of a letter to be submitted to a newspaper or representative?	Student meets expectations if he/she does the following: students are able to create a list of the elements of an informational/persuasive letter.	Provide students with several examples of letters and provide guidance as necessary to facilitate the creation of a list. Students should be able to recognize and describe the information that goes into each paragraph of the letter. Pacing: 30 minutes

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30 mins	CONTROLLING IDEA: Ability to establish a controlling idea and consolidate information relevant to task.	SHORT CONSTRUCTED RESPONSE Write an opening paragraph that states the position you will take in your letter and sequences the key points you plan to make to support that position.	Student meets expectations if he/she does the following: <ul style="list-style-type: none"> Writes a concise summary statement or draft opening. Provides direct answer to main prompt requirements. Establishes a claim. Identifies key points that support development of argument. 	<ul style="list-style-type: none"> Offer several examples of opening paragraphs. Ask class to discuss what makes them strong or weak. Review the list that students created earlier to identify needed elements (from Cluster 1, skill 2).
55 mins	DEVELOPMENT: Ability to construct an initial draft with an emerging line of thought and structure.	LONG CONSTRUCTED RESPONSE Write an initial draft complete with opening, development, and closing; insert and cite textual evidence.	Student meets expectations if he/she does the following: <ul style="list-style-type: none"> Provides complete draft with all identified as parts of a letter. Supports the writer's position in the later sections with evidence and citations from notes. 	<ul style="list-style-type: none"> Encourage students to re-read prompt partway through writing, to check that they are on track. <p>Pacing: 55 minutes</p>
30 mins	EDITING: Ability to proofread and format a piece to make it more effective.	NOTES Using the class list we have created for what needs to be in a good response to the prompt and the list of features of a good letter, read the drafts of your group members, noting problems that need to be addressed to improve the letter.	Student meets expectations if he/she does the following: <ul style="list-style-type: none"> Provides peers with appropriate suggestions for revision of the draft. 	<ul style="list-style-type: none"> Briefly review selected skills that many students need to improve. Teach a short list of proofreading marks. Assign students to groups of 3-4 to proofread each other's drafts. <p>Pacing: 30 minutes</p>
30 mins	REVISION: Ability to refine text, including line of thought, language usage, and tone as appropriate to audience and purpose.	LONG CONSTRUCTED RESPONSE Using the notes from your group members and what you learned from reading your peers' letters, develop a second draft of your letter. Use textual evidence carefully, with accurate citations. Decide what to include and what not to include.	Student meets expectations if he/she does the following: <ul style="list-style-type: none"> Provides complete draft with all parts. Supports the opening in the later sections with evidence and citations. Improves earlier edition. 	<ul style="list-style-type: none"> Students who complete their second drafts early may want to peer edit again.
15 mins	EDITING: Ability to	LONG CONSTRUCTED	Student meets	<ul style="list-style-type: none"> Briefly review selected writing conventions that

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	proofread and format a piece to make it more effective.	RESPONSE Revise draft to have sound spelling, capitalization, punctuation, and grammar. Adjust formatting as needed to provide clear, appealing text.	expectations if he/she does the following: <ul style="list-style-type: none">• Provides draft free from distracting surface errors.• Uses format that supports purpose.	many students need to improve. <ul style="list-style-type: none">• Teach a short list of proofreading marks.• Assign students to proofread each other's texts a second time if desired.
20 mins	COMPLETION: Ability to submit final piece that meets expectations.	LONG CONSTRUCTED RESPONSE Turn in your complete set of drafts, plus the final version of your piece	Student meets expectations if he/she does the following: <ul style="list-style-type: none">• Fits the "Meets Expectations" category in the rubric for the teaching task.	Not Provided

Instructional Resources

No resources specified

Section 4: What Results?

Student Work Samples

Advanced

 **Student Example**

 **Student Example 2**

Meets Expectations

 **Student Example 3**

 **Student Example 4**

Approaches Expectations

 **Student Example 5**

Not Yet

 **Student Example 6**

Teacher Reflection

This is a module I used with my 8th grade Physical Science gifted students. This module gives students the background knowledge as they move on into Environmental Science, Biology, and Chemistry in High School.

This is a rich module, one that allows for conversations about how political decisions are made, how science is used and manipulated to sway public opinion.

All Attachments

🔗 The DDT Story. This article outlines problems with widespread use of DDT. (student) :

<https://s ldc.org/u/4lhwg5t986muyor560ua1p4vm>

🔗 DDT-A Brief History. The EPA website outlines the history of the ban on DDT. (student) :

<https://s ldc.org/u/6qwnp2bf7nuspwk9endcctpsc>

🔗 PARACHUTING CATS AND CRUSHED EGGS The Controversy Over the Use of DDT to Control Malaria. This article details the unintended consequences of the use of DDT, as illustrated by the event in Borneo in the 1950's. (student/teacher) : <https://s ldc.org/u/9thzne85fkb8lhvuz5i26ivr4>

📄 Student Example : <https://s ldc.org/u/dzwalaaxn3ibapdgrvcjx4rhp>

📄 Student Example 2 : <https://s ldc.org/u/24qeppjlhnofi8zo97xpvp98q>

📄 Student Example 3 : <https://s ldc.org/u/a1rwqassxx2etqayb98gp17sr>

📄 Student Example 4 : <https://s ldc.org/u/4oenht39empalqbqbij8vwcy1>

📄 Student Example 5 : <https://s ldc.org/u/17k3ioml1plyt9ftmohg77maq>

📄 Student Example 6 : <https://s ldc.org/u/dus81werxkkl4bougawavm5d>