Rachel Carson: Sounding an Environmental Alarm

Lesson Plan

Produced by Earth Day Network in association with American Experience
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INTRODUCTION

In this lesson, students will discover who Rachel Carson was and why she felt compelled to write Silent Spring by analyzing the fable in the first chapter of the book. They will examine the impact of this fable, discuss these issues, learn about DDT, and better understand Carson’s impact on the environmental movement.

LESSON OVERVIEW

Grade Level & Subject: Grades 5-8: Language Arts and Science

Length: 1-2 class periods

Objectives:
After completing this lesson, students will be able to:

• Learn who Rachel Carson was and what motivated her to write Silent Spring.
• Understand the negative effects of DDT and pesticides.
• Analyze and illustrate a fable to identify the purpose of Carson’s book and the birth of the modern environmental movement.

National Standards Addressed: ¹
This lesson addresses the following National Education Standards from the National Council of Teachers of English:

• Content Standard: NL-ENG.K-12.1 READING FOR PERSPECTIVE
  ▪ Students read a wide range of print and non-print texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.

• Content Standard: NL-ENG.K-12.3 EVALUATION STRATEGIES
  ▪ Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, graphics).

• Content Standard: NL-ENG.K-12.6 LANGUAGE ARTS
  ▪ Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and non-print texts.

¹ http://www.educationworld.com/standards/.

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This lesson addresses the following National Science Education Standards from the National Academies of Science:

• Content Standard: NS.5-8.6 PERSONAL AND SOCIAL PERSPECTIVES
  ▪ As a result of activities in grades 5-8, all students should develop understanding of:
    ▪ Personal health
    ▪ Populations, resources, and environments
    ▪ Natural hazards
    ▪ Risks and benefits
    ▪ Science and technology in society

Materials Needed:

• Reproducible #1 – A Fable for Tomorrow Worksheet
• Reproducible #2 – What is DDT Information Sheet
• Reproducible #3 – Connecting DDT to Rachel Carson’s “A Fable for Tomorrow” Worksheet
• Reproducible #4 – A Fable for Tomorrow Answer Key
• Reproducible #5 – Connecting DDT to Rachel Carson’s “A Fable for Tomorrow” Answer Key
• Paper for drawing
• Colored pencils or markers for drawing (optional)
• Index cards or paper (Extension Activity #1)
• Large paper for illustrations of biological magnification (Extension Activity #2)
• Computers with internet access (Extension Activity #2)
• Graph paper or computers with a graphing program (Extension Activity #3)

Assessment:

• Completion of Reproducible Worksheets
• Participation in classroom discussion or group discussion

LESSON BACKGROUND

Relevant Vocabulary:

• **DDT or dichloro diphenyl trichlo**: a colorless odorless water-insoluble insecticide that was banned in the United States in 1972 and tends to accumulate and persist in ecosystems and has toxic effects on many vertebrates. ²

• **Rachel Carson**: a biologist who turned an assignment on the effects of DDT and pesticides in America into a classic book called *Silent Spring*.

• **Silent Spring**: A book by Rachel Carson published in 1962 by Fawcett World Library outlining the effects of DDT on American society; often claimed to be the kick-off for the environmental movement. ³

• **Pesticide**: a chemical agent used to destroy pests. ⁴

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• **Synthetic:** describing something artificially-crafted.  
• **Malaria:** a harmful disease carried by mosquitoes.
• **Insoluble:** incapable of being dissolved in a liquid and especially water.
• **Fat solubility:** dissolvable in fat.
• **Biological magnification:** also known as biomagnification, refers to the process whereby certain substances such as pesticides or heavy metals move up the food chain, work their way into rivers or lakes, and are eaten by aquatic organisms such as fish, which in turn are eaten by large birds, animals or humans. The substances become concentrated in tissues or internal organs as they move up the chain.

• **“A Fable for Tomorrow” Vocabulary:**
  - Fable: a narration intended to enforce a useful truth.
  - Malady: a disease or disorder of the body.
  - Viburnum: widely distributed shrubs or small trees of the honeysuckle family.
  - Alder: any of a genus (*Alnus*) of toothed-leaved trees or shrubs of the birch family, which become woody and typically grow in cool moist ground.
  - Migrant: a person or animal who moves regularly.
  - Birch: a tree from the genus *Betula* of the family Betulaceae, the birch family
  - Moribund: being in the state of dying; approaching death.
  - Blight: something that impairs or destroys; a deteriorated condition.

**Information:**

“Our aim should be to guide natural processes as cautiously as possible in the desired direction rather than to use brute force... Life is a miracle beyond our comprehension, and we should

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reverence it even when we have to struggle against it . . . Humbleness is in order; there is no excuse for scientific conceit here.” – Rachel Carson in *Silent Spring*

As World War II broke out in 1939, scientists were synthesizing an increasing and dramatic amount of chemicals for use on farms and in industrial processes. The purpose was to “increase food production by eliminating pests;” however, the residue of such actions was leaking untold amounts of chemicals into soil, plants and animals, affecting humans who suffered disease and additional maladies. From 1947 to 1960, the use of pesticides increased from 1.24 to 6.37 million pounds, growing fivefold in a thirteen year span.

Meanwhile Rachel Carson was working as editor-in-chief for the U.S. Fish and Wildlife Service and had been publishing several environmental books of rising popularity, including *Under the Sea-Wind* (1941), *The Edge of the Sea* (1955) and *The Sea around Us* (1951). Of the three, this last publication was successful enough to allow Carson’s temporary retirement and full dedication to writing and research. Recognizing the rampant use of pesticides and their possible consequences, Carson embarked upon her newest book project in 1952. It was only in June 1962, after a decade of rejection, that *Silent Spring* was originally published in *The New Yorker.*

Immediately upon its publication, there was overwhelming backlash towards the book and Carson personally. Yet, all this criticism only made *Silent Spring* more popular; the book has sold more than 500,000 hard copies since first published, was listed on the *New York Times* bestseller list for thirty-one weeks, and was published in twenty-four countries.

Despite the onslaught of criticism, Carson stated that in her research for *Silent Spring,* “what I discovered was that everything which meant most to me as a naturalist was being threatened, and that nothing I could do would be more important.” Today, she is often credited with being one of the environmental heroes of the twentieth century.

**Resources:**
- Cruising Chemistry Site: Pesticides Section on DDT  
- Online Radford University Environmental History Timeline:  
  [http://www.runet.edu/~wkovarik/envhist/](http://www.runet.edu/~wkovarik/envhist/).
- Rachel Carson’s Biography:  
- Smithsonian Institute “Forces of Change: Atmosphere.” Media Library Timeline  
  [http://forces.si.edu/atmosphere/swf/timeline.html](http://forces.si.edu/atmosphere/swf/timeline.html).

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21 Matthiessen, Peter. *The TIME 100: Rachel Carson.* Retrieved December 7, 2009 from  

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[www.earthday.net/education • education@earthday.net](http://www.earthday.net/education • education@earthday.net).
• Stockholm Convention on Persistent Organic Pollutants “DDT Overview”
• The TIME 100: Rachel Carson bibliography:
  http://www.time.com/time/time100/scientist/profile/carson02.html.

LESSON STEPS

Warm Up: What Compels You?
1. Begin this lesson by asking students the following question: What do you feel so strongly about that you would want to fully dedicate yourself to it, producing a groundbreaking work of literature, film, music or other media, even if this risked your professional reputation and how others thought of you? Allow students to briefly share responses.

2. Introduce students to Rachel Carson by showing the video clip of her in Earth Days,22 (film chapter: Rachel Carson and “Silent Spring”) beginning with, “The concept that the planet is very fragile” and ending with “our mastery not of nature, but of ourselves.” (See Appendix for transcript.)

3. Explain that Rachel Carson was a biologist in the 1950s-60s who was compelled to share her concern about pesticides, even at the risk of her professional reputation. This lesson will introduce you to Rachel Carson, her concern, her actions, and the impact on her life and broader society.

Activity One: Reading “A Fable for Tomorrow”
Students read Rachel Carson’s fable from Silent Spring and then complete Reproducible #1 – A Fable for Tomorrow Worksheet. (This can be done in class or as a homework assignment.)

1. Have students read “A Fable for Tomorrow,” the four-page first chapter of Rachel Carson’s book Silent Spring.23 This can be found at your local library or online.

2. Set aside enough time (about 10 minutes) for the students to read the fable or read it together as a class.

3. Once they are finished reading, ask them to fill out the Starter Questions Section on the “A Fable for Tomorrow” Worksheet.

4. Once this section is completed, go over the questions together, using Reproducible #4 – “A Fable for Tomorrow” Answer Key.
   a. Make sure students understand that there are two very different descriptions of the town, and that the change in language began around the mention of the “strange blight.”

5. After going over the Starter Questions, move on to the next section. Read the directions to
the students, and then have them fill in the table individually or as a class.

6. Once their tables are filled in, ask for student volunteers to share the descriptions they
chose to describe the town before the “strange blight.”

7. Now go over the second column, asking for student volunteers to share the descriptions
they chose to describe the town after the “strange blight.”

Activity Two: Drawing Two Towns
Students will use descriptions from Rachel Carson’s fable to visually illustrate how the town changed.

1. Read the directions from the third section of Reproducible #1 – “A Fable for Tomorrow”
   Worksheet, explaining to them that they will be drawing two pictures, and that the pictures
   should correspond to the phrases and words they wrote down in the table.
   a. For example, their “Town” picture might include drawings of different birds nesting
      in trees, while their “Silent Spring Town” picture might depict fewer birds and other
      animals.

2. Allow enough time for students to complete their drawings.

3. Ask them to share their pictures, either with the whole class or in groups.

4. Encourage students to discuss why they selected certain descriptions, if the mood changed in
   their picture, and their thoughts for both pictures.

Activity Three: Learning about DDT
Students will discover why the town changed, learn about DDT, and connect descriptions in the
fable to information on DDT.

1. After their drawings, ask students to look at the heading on top of the picture “Silent Spring
   Town: After Blight.” Note that the blight was of utmost concern for Rachel Carson and one
   of the main reasons she wrote her book.

2. Ask students if they know what the “blight” might have been.
   a. Ask if anyone knows what pesticides are. It is a chemical agent used to destroy pests, such as
      insects, that ruin crop or plant growth or spread disease.24
   b. Where are they? Practically everywhere. According to Duke University’s Chemical Studies
      website, they are in places such as pools, food, wool clothing, wood, and other areas.25

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webster.com/dictionary/pesticide.
c. Why are they used? For food, they can increase harvest and productivity. For wood and wool, they can prevent the breakdown of these materials from insects (moths leaving holes in wool clothing or termites chewing up wood in houses).

d. Why is Carson focusing on the negative aspects of pesticide use? At the time, she witnessed the largest increase in pesticide use in U.S. history. She saw firsthand the dangerous ramifications of such wide usage, and she was compelled to share her findings.

3. Introduce the word “DDT” to students and hand out Reproducible #2 – What is DDT Information Sheet. Let them know that around the time Carson wrote her book, DDT was a hot topic in the news. Then allot enough time for students to read the information on DDT. Go over questions they may have.

3. Handout Reproducible #3 – Connecting DDT to Rachel Carson’s “A Fable for Tomorrow” Worksheet. Have students answer the questions while connecting phrases and sentences in “A Fable for Tomorrow” to what they have learned about DDT.

Wrap Up:
Go over the answers to the critical thinking questions in Reproducible #3 – Connecting DDT to Rachel Carson’s “A Fable for Tomorrow” Worksheet. Then, use this time to discuss Rachel Carson and her book. Remind students that Carson’s book was controversial at the time, and her professional and personal integrity were questioned. Silent Spring, however, became so popular that Rachel Carson and the publication of her book are now identified as the beginning of the modern environmental movement.

Extension:

1. Connecting Rachel Carson to Literary and Historic Figures
Explain to your students that Rachel Carson risked her professional reputation to communicate her findings in Silent Spring to the public. She was motivated to bring light to a topic she believed was important, no matter the outcome. Take a few minutes to discuss with students what qualities Rachel Carson must have had in order to write this book. Examples might include courage, vision, dedication to the health of future generations, etc. Then give each student a large index card or piece of paper. Ask students to take one or two minutes to respond in writing to the following questions:
   - What literary, movie or other characters remind you of Rachel Carson and why?
   - What historical figures remind you of Rachel Carson and why?
   - Who have you personally known who reminds you of Rachel Carson and why?

Read aloud the first question and then give students a minute or two to write their answers before reading the second question. Continue this for each question. Have students volunteer to share their responses to the first question. On large poster-size paper, record the main ideas shared. (Prepare this paper ahead of time by writing the question across the top. You will need one large sheet for each question.) After a minute or two, move onto the next question. Once students have shared their responses to the third question, ask them to individually respond in writing to the following question: Which of Rachel Carson’s attributes would you like to exhibit in your life and why? Again, have students volunteer to
share their reflections with one another, and record the main ideas. Post the sheets of paper with ideas for all to see.

2. **Biological Magnification**

*Silent Spring* was based on Carson’s understanding of biology and how natural systems work. Her observations of the disappearance of birds and other living organisms were related to the concept of biological magnification. Explain and illustrate this concept to your students. Biological magnification is the process whereby certain substances such as pesticides or heavy metals move up the food chain, work their way into rivers or lakes, and are eaten by aquatic organisms such as fish, which in turn are eaten by large birds, animals or humans. The substances become concentrated in tissues or internal organs as they move up the food chain. Individually or in small groups, have students research and illustrate other examples of biological magnification and then present their findings to the class through brief oral presentations in class or online. Ask each presenting group to make an illustration that depicts the concentration of their substance through a food chain and its consequences. The visual should be made so it can be viewed by the class (a poster or illustration that can be projected). Each group could also prepare a worksheet with questions for other members of the class. By completing the sheet at the conclusion of the presentation or as homework, students will test their understanding of the material presented. The presenting group can correct the worksheets completed by fellow classmates.

Possible research topics: mercury poisoning of humans and pets in Minimata, Japan in the 1950s; DDD poisoning of grebes (fish-eating birds) at Clear Lake, CA in 1949; PCB concentrations in fish in the Potomac River; and possible biological magnification in smallmouth bass in the Potomac River causing intersex fish (fish with male and female sex organs).

3. **Birds of Prey Make a Comeback: Graph the Data**

Since the use of DDT was banned in the United States in 1972, the populations of the birds of prey (eagles and osprey) most seriously affected have made a significant comeback. For example, each state tracked the number of pairs of nesting bald eagles from 1990 to 2006. To see the results of this research, go to the [U.S. Fish and Wildlife Service website](http://www.fws.gov/midwest/Eagle/population/nos_state_tbl.html) 27

Ask students to graph the data by using your preferred graphing program or by hand. (Line graphs would be particularly useful for this data set.) You can select data to graph in a variety of ways. For example, one could analyze the results for states in your region of the country; results for a variety of states representing various regions of the country; the 10 with the highest eagle populations, or graph all of the results! Questions for students:

- What was the overall trend of bald eagle populations during this time period? Were there any exceptions?
- In 2000, what three states had the highest number of nesting pairs? How many?

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• What was the average increase in population for the states you reviewed? What percentage increase does this represent?
• Was the change in population steady, or were there particular years in which it changed more dramatically?
• Why do you think the bald eagle population numbers have changed?

CONCLUSION

The lesson provided students with an introduction to Rachel Carson’s most popular work, *Silent Spring*, a summary of DDT, as well as exercises to help students analyze the first chapter of the book and its lasting purpose. They read and analyzed the fable, discussed relevant issues, learned about DDT, and gained better understanding of Carson’s impact on the growth of the environmental movement.

LESSON PLAN CREDITS

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Rachel Carson’s “A Fable for Tomorrow” Worksheet  Name:  
Date:

Vocabulary Matching Section: Draw a line from the word to its correct definition.28

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fable</td>
<td>tree from <em>Betula</em> genus</td>
</tr>
<tr>
<td>Alder</td>
<td>being in the state of dying: approaching death</td>
</tr>
<tr>
<td>Malady</td>
<td>something that impairs or destroys</td>
</tr>
<tr>
<td>Migrant</td>
<td>shrubs or trees from honeysuckle family</td>
</tr>
<tr>
<td>Viburnum</td>
<td>a narration intended to enforce a useful truth.</td>
</tr>
<tr>
<td>Blight</td>
<td>a person or animal that moves regularly</td>
</tr>
<tr>
<td>Birch</td>
<td>a disease or disorder of the body</td>
</tr>
<tr>
<td>Moribund</td>
<td>temperate shrub or tree related to the birch</td>
</tr>
</tbody>
</table>

Starter Questions

Is this a real town?

When does the story shift? Think of how the author’s description changes.

What caused the destruction of nature and outbreak of sickness?

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**Directions:** In the table below, please write down key phrases or words from “A Fable for Tomorrow” that you think show the difference between the description of the town at the beginning of the story and how it changed by the end of the story. Place the first set of descriptions under the title “Town” and the second set under “Silent Spring Town.”

**Example:**

<table>
<thead>
<tr>
<th>Town</th>
<th>Silent Spring Town: After the Blight</th>
</tr>
</thead>
<tbody>
<tr>
<td>• white clouds of bloom</td>
<td>• a strange blight</td>
</tr>
<tr>
<td>• great ferns and wildflowers delighted the traveler’s eye</td>
<td>• browned and withered vegetation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Town</th>
<th>Silent Spring Town: After the Blight</th>
</tr>
</thead>
</table>
Directions Continued: Using the adjectives, nouns, and key phrases you have written in your table, draw and color two separate pictures reflecting how the town changed. The pictures don’t necessarily have to be of towns, but they should reflect Carson’s prose.

<table>
<thead>
<tr>
<th>Town</th>
<th>Silent Spring Town: After the Blight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What is DDT?

Name:

Date:

DDT (dichloro diphenyl trichlo) is a synthetic pesticide. 29 Synthetics are artificially-crafted, meaning that they are produced by humans and not found in nature. A pesticide is a chemical used to kill pests, such as insects. At first, DDT was widely used to eliminate mosquitoes that carry the harmful disease, malaria, but later it was used on farms and in industrial processes to control agricultural pests, such as various potato beetles, codling moth, corn earworm, cotton bollworm, and tobacco budworms. 30 Its purpose was to increase the amount of food produced on farms by killing the pests that were destroying crops. Yet, as Rachel Carson demonstrates in her book, Silent Spring, there were dangerous and adverse effects to DDT.

DDT is insoluble in water. This means it cannot be dissolved in water, so it is difficult to remove from the environment or the tissues of living organisms. One group of animals most vulnerable to DDT is aquatic invertebrates. These include small insects and other creatures without backbones that live in water, such as clams and worms, which constitute a substantial portion of the food chain.

While DDT is insoluble in water, it is readily dissolvable in fats, including the fat tissues found in animals (and people). Because of DDT’s fat solubility, fats in animals can become storehouses for DDT accumulation. Therefore, DDT cannot be removed from water but is soaked up by fat. Its solubility and insolubility make DDT a persistent pollutant: a toxin that just won’t go away!

“One of the reasons why we worry about DDT is because it doesn't break down in the environment or in organisms.” - University of San Diego, Creators of Cruising Chemistry

How much DDT is bad for you? The answer to this depends on the amount of DDT that you are exposed to, how much DDT you carry in your body, and your weight. Nevertheless, even a small amount as low as six to ten milligrams of DDT per kilogram, can cause nausea, diarrhea, irritation, and excitability. One of the more severe symptoms is losing control of your muscles, either through erratic movements or paralysis. 32 DDT also affects other animals. For example, it can disturb the reproductive processes of certain birds, such as the thinning of eggshells, or lead to imbalance of ions in cells that affects the nervous systems in some fish. 33

DDT started being more widely used on farms for pest control in the 1940s. From 1947 to 1960, the use of pesticides went from 1.24 to 6.37 million pounds, growing fivefold over a 13 year span. 34 The dangerous effects of pesticides were not well known until Rachel Carson’s book Silent Spring, in

which “A Fable for Tomorrow” illustrated DDT’s adverse effects. While DDT helped farmers to reduce crop damage and loss, Rachel Carson is known for conducting research and bringing attention to the damage it causes to other living systems. The book shocked and concerned so many Americans that then U.S. President John F. Kennedy ordered a scientific investigation on DDT. Later, the U.S. Environmental Protection Agency (EPA) decided that a process to remove its use in agriculture should begin immediately and a ban took place in the U.S. in 1972. Consequently, a worldwide ban was instituted in 2004 under the Stockholm Convention.35 The Convention, however, was limited and still allowed for developing countries to use DDT to counteract malaria; a full ban is now being sought, as well as the broader implementation of safer alternatives.36

“Our aim should be to guide natural processes as cautiously as possible in the desired direction rather than to use brute force... Life is a miracle beyond our comprehension, and we should reverence it even when we have to struggle against it... Humbleness is in order; there is no excuse for scientific conceit here.” – Rachel Carson in Silent Spring37

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Connecting DDT to Rachel Carson’s “A Fable for Tomorrow”

Name:
Date:

Directions: After reading the information about DDT, answer the following questions. You will be relating what you read in Rachel Carson’s “A Fable for Tomorrow” to what you have just learned about DDT.

1. What is Carson warning us about?

2. Why do you think Carson titles it “A Fable for Tomorrow”? Think about the choice of words in the title.

3. A question is asked in the fable: “What has already silenced the voices of spring in countless towns in America?” What is the answer?

Critical Thinking Questions:
1. After reading the short information on DDT, what side effect do you think Carson is describing when she says “They [the birds] trembled violently?”

2. “On the farms the hens brooded, but no chicks hatched” refers to what category of DDT’s effects?

3. (Open-ended Question) Rachel Carson states that “humbleness” is required when we begin to work with nature. What do you think she means? How can we have humbleness toward nature?
Rachel Carson’s “Fable for Tomorrow” Worksheet - Answer Key

Name: ___________________________  Date: _____________

Vocabulary:
Fable: a narration intended to enforce a useful truth.
Malady: a disease or disorder of the body.
Viburnum: shrubs or trees from honeysuckle family
Alder: temperate shrub or tree related to the birch
Migrant: a person or animal that moves regularly
Birch: tree from Betula genus
Moribund: being in the state of dying; approaching death
Blight: something that impairs or destroys.38

Starter Questions
Is this a real town?
A: No, in paragraph nine, Carson states that the town does not exist, but she also writes many of the things that happened in this story happened to real people.

When does the story shift? Think of how the author’s description changes.
A: In paragraph three, Carson mentions “a strange blight,” and from that point on, the description of the town dramatically changes.

What caused the destruction of nature and outbreak of sickness?
A: In paragraph eight, Carson clarifies that the blight was happening because of people, not because of some unordinary or unfamiliar phenomenon.

Selections of Carson’s Descriptions:

<table>
<thead>
<tr>
<th>Town</th>
<th>Silent Spring Town</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life in harmony with its surroundings</td>
<td>Mysterious maladies</td>
</tr>
<tr>
<td>Checkerboard of prosperous farms</td>
<td>Shadow of death</td>
</tr>
<tr>
<td>Fields of grain Hillsides of orchards</td>
<td>Doctors had become more puzzled</td>
</tr>
<tr>
<td>Oak Maple Birch set up a blaze of color that flamed and flickered across a backdrop of pines</td>
<td>Strange stillness</td>
</tr>
<tr>
<td>Countless birds came to feed on berries</td>
<td>Feed stations were deserted</td>
</tr>
<tr>
<td>And on seed heads of dried weeds rising above the snow</td>
<td>Birds were moribund; they trembled violently</td>
</tr>
<tr>
<td>Streams flowed clear and cold out of the hills</td>
<td>Hens brooded, but no chicks hatched</td>
</tr>
<tr>
<td>Shady pools where trout lay</td>
<td>A white granular powder had fallen upon the roofs, lawns, etc.</td>
</tr>
</tbody>
</table>

Connecting DDT to Rachel Carson’s “A Fable for Tomorrow”

Name:
Date:

Directions: After reading the information about DDT, answer the following questions. You will be relating Rachel Carson’s “A Fable for Tomorrow” to what you have just learned about DDT.

1. What is Carson warning us about? *The negative consequences all American cities could face if the widespread use of DDT is not curbed.*

2. Why do you think Carson titles it “A Fable for Tomorrow”? Think about the choice of words in the title.
   *A fable is a story usually told to teach a moral lesson. Here the word “tomorrow” might not only refer to the next day, but to the future in general. She wants to send a message concerning the future of our environment.*

3. A question is asked in the fable: “What has already silenced the voices of spring in countless towns in America?” What is the answer?
   *A: Specifically, the pesticide DDT.*

Critical Thinking Questions:

4. After reading the short information on DDT, what side effect do you think Carson is describing when she says “They [the birds] trembled violently?”
   *If one has a significant amount of DDT in the body, it could result in muscle convulsions.*

5. “On the farms the hens brooded, but no chicks hatched” refers to what category of DDT effects? *DDT’s interference with bird’s reproduction and the thinning of eggshells.*

6. (Open-ended Question) Rachel Carson states that “humbleness” is required when we begin to work with nature. What do you think she means? How can we have humbleness toward nature?
<table>
<thead>
<tr>
<th>Source</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stewart Udall (archival footage) SUBTITLE (see lower thirds)</td>
<td>The concept that the planet is very fragile really came out Rachel Carson’s book. Silent Spring sounded the alarm…</td>
</tr>
<tr>
<td>Stewart Udall Interview</td>
<td>That we were destroying the life support system of the planet.</td>
</tr>
<tr>
<td>Stewart Udall (book cover graphic, archival footage)</td>
<td>The book was a sensation; it was printed in over 30 languages.</td>
</tr>
<tr>
<td>Stewart Udall (book cover graphic, archival footage)</td>
<td>The book was a sensation; it was printed in over 30 languages.</td>
</tr>
<tr>
<td>Paul Ehrlich (archival photos, archival footage)</td>
<td>Rachel Carson has to get the main credit for modern environmental movement because she was the first one to point out one of the serious environmental problems that was the over use of pesticides.</td>
</tr>
<tr>
<td>Paul Ehrlich Interview CARD (see lower thirds)</td>
<td>It was the right moment, the right book, and the right personality. Although the pesticide industry tried to demonize her, Rachel Carson didn’t demonize easily.</td>
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<tr>
<td>Rachel Carson, on camera in archival footage</td>
<td>Unless we do bring these chemicals under better control we are certainly headed for disaster.</td>
</tr>
<tr>
<td>Rachel Carson speaks (archival footage of DDT spraying)</td>
<td>The balance of nature is built of a series of interrelationships between living things, and between living things and their environment. You can’t just step in with some brute force and change one thing without changing many others. Now this doesn’t mean of course that we must never interfere, that we must not attempt to tilt that balance of nature in our favor but when we do make this attempt we must know what we are doing. We must know the consequences.</td>
</tr>
<tr>
<td>Stewart Udall (newspaper graphics)</td>
<td>There was an ugly backlash after the book came out. The chemically industries were calling her a hysterical woman that didn’t know what she was talking about.</td>
</tr>
<tr>
<td>Dr. White (?) on camera in archival footage</td>
<td>The major claims in Ms. Carson’s book Silent Spring are gross distortions of the actual facts. Completely unsupported by scientific experimental evidence, and general practical experience in the field.</td>
</tr>
<tr>
<td>Dr. White (?) speaks, archival footage of chemists in lab</td>
<td>Ms Carson maintains that the balance of nature is a major force in the survival of man, whereas the modern chemist, modern chemist, the modern biologist believes that man is steadily controlling nature.</td>
</tr>
<tr>
<td>Denis Hayes (archival footage)</td>
<td>Something that we all thought of prior to her as…</td>
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<tr>
<td>Denis Hayes Interview</td>
<td>Better living thru chemistry in a sense. You are pouring this stuff on your crops…</td>
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</tbody>
</table>

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www.earthday.net/education • education@earthday.net
| Denis Hayes (archival footage) | And you are producing more crops it really wasn’t something where you thought, my goodness people are intentionally poisoning the environment and that those poisons might not be as selective as they are telling us. |
| Denis Hayes (archival footage) | And you are producing more crops it really wasn’t something where you thought, my goodness people are intentionally poisoning the environment and that those poisons might not be as selective as they are telling us. |
| Stephanie Mills (archival footage) | Rachel Carson was incredibly scrupulous in the creation of Silent Spring. She understood that… |
| Stephanie Mills Interview | We are organisms as much as the birds whose songs were being silenced. |
| Stephanie Mills (archival footage) | She wrote not only a tremendously informative book, but uh an incredibly moving book, and she did it while she was suffering from cancer. |
| Stewart Udall (archival footage) | There was a controversy that raged… |
| Stewart Udall Interview CARD (see lower thirds) | Really until her death it was still going on and that was kind of sad because uh she was a shy person. She was not a crusader. She was a scientist. |
| Reporter at JFK press conference | There appears to be growing concern amongst scientists at the possibility of dangerous long-range side effects from the widespread use of DDT and other pesticides. |
| Stewart Udall (newspaper graphic, archival footage) | President Kennedy’s science advisory group reported that Rachel Carson’s method of research |
| Stewart Udall Interview | was sound and her findings and conclusions were generally correct. |
| Stewart Udall (archival footage) | President Kennedy backed Rachel Carson… |
| President Kennedy speaks at press conference | I think, particularly, of course uh, with Ms Carson’s book… |
| Stewart Udall (archival footage of JFK press conference) | And that put the chemical industry on the defensive. |
| Rachel Carson archival VO over archival footage | I truly believe that we in this generation must come to terms with nature. And I think we are challenged as mankind has never been challenged before to prove our maturity and our mastery not of nature, but of ourselves. |