



Recommended for GRADES 3-5 (you may modify for other ages)

## *Destination: Earth* – Curriculum Guide (Item 1 of 3)

Adapted from the book: *Her Story: A Timeline of the Women Who Changed America* by Charlotte S. Waisman and Jill S. Tietjen, New York: HarperCollins, 2008.

Dear Educator,

We are pleased that you are receiving this slide presentation (See Item 2 of 3) to use in your classes. This document provides comments, directions, and options for your use in preparing curricula for your class. In a separate document are flash cards featuring the accomplishments of 20 women (See Item 3 of 3). Only nine of the 20 are in the slide presentation but you can feel free to add more, should you have more time in your class. We present a whole set of flash cards which can be used to enhance the participation of your students; use as many or as few as suits your needs.

We welcome you to read our book and to connect with us. (See [www.herstoryatimeline.com](http://www.herstoryatimeline.com)) To develop these teaching materials, we have chosen to follow one theme from our book. For classroom and curriculum use, there are many other ways to use the information in the book by concentrating on different thematic issues. For example, one can follow the important women in politics and public service. Another thread is to follow the women who played a significant role in major social movements. You will come to know the book as a whole; it contains brief profiles of over 850 key and influential women in the history of the United States, in a timeline format that also clarifies important moments in our country's history. The overwhelming majority of the women who are identified are excellent role models for both girls and boys.

The focus for this particular curriculum is on a series of slides that accompany this document. They highlight some of the women who made noteworthy contributions in earth sciences and in advocating for a cleaner environment. We have chosen to name this module *Destination: Earth*.

This teaching module is meant to identify a number of different types of contributions made by women who worked in the sciences to better our planet. We touch on women who worked in chemistry, limnology, botany, physics, primatology, biology, oceanography, geology, and in the environmental movement. Any of these topics could be expanded in further detail in a series of lessons that you create to aid in that exploration.



Use our ideas “as is” or incorporate changes that are appropriate for your learning environment. Most of all, enjoy reading and teaching about these exemplary women “on whose shoulders we all stand.”

## Curricular Standards

This curriculum has been developed to conform to the Texas Essential Knowledge and Skills standards for Grades 3-5. Specifically, the presentation, flash cards, and optional assignments provide the following:

### Third Grade

#### English Language Arts and Reading

§110.5 English Language Arts and Reading, Grade 3.

(b) Knowledge and Skills.

(8) Reading/vocabulary development. The student develops an extensive vocabulary. The student is expected to: (C) use resources and references such as beginners’ dictionaries, glossaries, available technology, and context to build word meanings and to confirm pronunciations of words (2-3);

#### Science

§112.5 Science, Grade 3.

(b) Knowledge and skills.

(3) Scientific processes. The student knows that information, critical thinking, and scientific problem solving are used in making decisions. The student is expected to: (E) connect Grade 3 science concepts with the history of science and contributions of scientists.

#### Social Studies

§113.5 Social Studies, Grade 3.

(a) Introduction

(1) In Grade 3, students learn how individuals have changed their communities and world. Students study the effects inspiring heroes have had on communities, past and present. Students learn about the lives of heroic men and women who made important choices, overcame obstacles, sacrificed for the betterment of others, and embarked on journeys that resulted in new ideas, new inventions, and new communities.

Students expand their knowledge through the identification and study of people who made a difference, influenced public policy and decision making, and participated in resolving issues that are important to all people. Throughout Grade 3, students develop an understanding of the economic, cultural, and scientific contributions made by individuals.

(b) Knowledge and skills.

(3) History. The student understands the concepts of time and chronology. The student is expected to: (B) create and interpret timelines.

(13) Culture. The student understands the role of real and mythical heroes in shaping the culture of communities, the state, and the nation. The student is expected to: (A) identify the heroic deeds of state and national heroes such as Daniel Boone and Davy Crockett.



(15) Science, technology and society. The student understands how individuals have created or invented new technology and affected life in communities around the world, past and present. The student is expected to:

(A) identify scientists and inventors such as Louis Daguerre, Cyrus McCormick, Louis Pasteur, and Jonas Salk who have created or invented new technology; and

(B) identify the impact of new technology in photography, farm equipment, pasteurization, and medical vaccines on communities around the world.

#### **Fourth Grade**

##### **Science**

§112.6 Science, Grade 4.

(b) Knowledge and skills.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to: (E) connect Grade 4 science concepts with the history of science and contributions of scientists.

##### **Social Studies**

§113.6 Social Studies, Grade 4.

(a) Introduction.

(1) . . . Students identify the contributions of people of various racial, ethnic, and religious groups to Texas and describe the impact of science and technology on life in the state.

(b) Knowledge and skills.

(21) Science, technology and society. The student understands the impact of science and technology on life in Texas. The student is expected to: (A) identify famous inventors and scientists such as Gail Borden, Joseph Glidden, and Patillo Higgins and their contributions.

#### **Fifth Grade**

##### **English Language Arts and Reading**

§110.7 English Language Arts and Reading, Grade 5.

(b) Knowledge and Skills

(13) Reading/inquiry/research. The student inquires and conducts research using a variety of sources. The student is expected to: (D) interpret and use graphic sources of information such as maps, graphs, time lines, tables, or diagrams to address research questions (4-5).

(23) Viewing/representing/interpretation. The student understands and interprets visual images, messages, and meanings. The student is expected to: (B) interpret important events and ideas gleaned from maps, charts, graphics, video segments or technology presentations (4-8).

##### **Science**

§112.7 Science, Grade 5.

(b) Knowledge and skills.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to: (E) connect Grade 5 science concepts with the history of science and contributions of scientists.



## Social Studies

§113.7 Social Studies, Grade 5.

(a) Introduction.

(1) . . . In Grade 5, students learn about the history of the United States from its early beginnings to the present with a focus on colonial times through the 20<sup>th</sup> century. Historical content includes the colonial and revolutionary periods, the establishment of the United States, and issues that led to the Civil War. An overview of major events and significant individuals of the late-19<sup>th</sup> century and the 20<sup>th</sup> century is provided. . . Students examine the importance of effective leadership in a democratic society and identify important leaders in the national government. . . Students describe customs and celebrations of various racial, ethnic, and religious groups in the nation and identify the contributions of famous inventors and scientists.

(b) Knowledge and skills.

(5) History. The student understands important issues, events, and individuals of the 20<sup>th</sup> century in the United States. The student is expected to: (B) identify the accomplishments of notable individuals such as Carrie Chapman Catt, Dwight Eisenhower, Martin Luther King, Jr., Rosa Parks, Colin Powell, and Franklin D. Roosevelt who have made contributions to society in the areas of civil rights, women's rights, military actions, and politics.

(24) Science, technology and society. The student understands the impact of science and technology on life in the United States. The student is expected to: (A) describe the contributions of famous inventors and scientists such as Neil Armstrong, John J. Audubon, Benjamin Banneker, Clarence Birdseye, George Washington Carver, Thomas Edison, and Carl Sagan.

## Experiential Learning Activity

So, you can see how the module meets/exceeds the Texas Standards.

Now—to the IDEAS!

A specific, practical module to incorporate into your overall teaching plans is developed below.

- Activity Summary. Show a PowerPoint presentation (provided) that makes the students aware of the women who have made contributions to science and to making the Earth a better place.
- Age of Students. The *Destination: Earth* curriculum has been developed for third to fifth grade students. (You could also change this specific focus to meet the needs of your students' ages.) The book, *Her Story: A Timeline of the Women Who Changed America*, while clearly written for an adult audience, is useful as a reference since it is so highly visual.



You may wish to have at least one copy of the book available in your classroom and/or in your school library.

- Classroom make-up. It is anticipated that the class will be both boys and girls.
- Goals (Outcomes):
  1. To identify a number of important, historical female figures who have contributed to various fields of science and to improving the environment.
  2. To understand the interrelationship of the different areas of plant and animal science necessary to protect our environment.
  3. To interest students in a project or assignment, based on this teaching module, that takes their learning deeper.
- Group Size. There is no minimum or maximum number of students who would be the best audience for this module. The “typical” classroom size would work well. There is no need to divide into smaller groups, or subgroups although this can be a useful variation, should your class benefit from small group discussions.
- Time Required. From your introduction through showing the slides, through processing (or discussion or small group activity), the module itself may take one or more than one typical class period. Projects undertaken outside of class will require additional time and efforts on the part of the students. We have been deliberately flexible here, so as to encourage you to use this material as part of your overall curricular strategy in the ways it works best for you.
- Materials and AV Requirements.
  1. A computer to show the PowerPoint slides
  2. An LCD projector
  3. A screen
  4. A white board (or flip chart) and chalk or markers
  5. Blank paper and pencil/pen for notes or questions (each student will need to have these)
  6. Assignment Sheet (teacher-generated from ideas below)
  7. Copies of the quick quiz (provided) to distribute to all students



- Physical Setting. A typical classroom where the lights can be dimmed for projection purposes will work. There are no special seating or table requirements.
- Facilitating risk. The risk to the teacher is low, as all information is supplied in a step-by-step manner.
- Other. This curriculum module on *Destination: Earth* would, generally speaking, be introduced in a history or science class.
- **Process: (step by step)**
  1. To stimulate interest, ask the students to share out loud “how they would use science to help improve the environment”.
  2. Post their ideas/suggestions.
  3. Ask if they know any national or local women throughout U.S. history who are or who have been engaged in saving the environment (and post their answers, if any) – alternatively, have students answer the quick quiz provided later in this document.
  4. Show the PowerPoint presentation that identifies (listed by historical year) both the women and their contributions.
  5. Use the note pages that are below the slides to help provide the narrative you will say. (Or, print out the notes in a script format for yourself.)
  6. Stop at any time during the slides to take questions or to pose issues to your class.
  7. After the slides, conclude the module by returning to the ideas they had offered before the discussion and determine any new elements that have arisen as a result of what the students have seen.
  8. Create an assignment list from the choices noted below, that you wish to pursue.
  9. Give out your “add-on” assignments with due dates you assign, length you choose, and the like.
- Assignment Topics [Note to Teacher: The optional assignments vary in their difficulty and complexity. You may wish to determine the length of reports to be provided—a page—a paragraph, for example, or reduce the number of bullet points that students explore in preparing the assignment. The description below is a summary of each of the assignments. They are described in more detail on the notes section of each slide.]



1. Ellen Swallow Richards. Assignment about water pollution.
2. Florence Bascom. Assignment to learn more about where and how oil is produced.
3. Catherine Furbish. Assignment to learn more about biomass.
4. Ruth Patrick. Assignment to learn more about wetlands..
5. Marjory Stoneman Douglas. Assignment to learn more about an Everglades ecosystem.
6. Rachel Carson. Assignment to learn more about air pollution.
7. Maria Goeppert-Mayer. Assignment to learn more about certain elements of the periodic table.
8. Dian Fossey. Assignment to learn about an extinct animal.
9. Sylvia Alice Earle. Assignment to learn more about coral reefs. Assignment for student to think about his/her relationship with nature.
10. Conclusion slide. Student to think about how environmental problems will have been solved fifty years into the future and how that student will have helped.

Be sure to connect with us if you have any questions or issues. Also, let us know how your module goes!

Most Sincerely,

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## Glossary:

- Algae (AL·g): plants living in water that have no roots
- Biologist (bi·OWL·ă·jest): a scientist who studies plants and animals
- Biomass (bye·O·mass): material generated from plants and animals
- Bog (BAWG): wet, spongy ground
- Botanist (BOTT·ă·nist): a person who studies plants
- Bottomland (BOT·tom·land): low land through which a river flows
- Cypress (SIGH·press): evergreen tree
- Diatoms (DIE·ă·toms): one-celled algae that contain silica
- Ecology (ee·CALL·ă·g): a science that looks at relationships between organisms and their environment
- Ecosystem (ee·CO·sis·tom): the plants and animals in an area
- Everglades (EV·ēr·glayeds): a large swamp in Florida
- Extinct (x·STINKT): no longer alive
- Geology (g·OWL·ă·g): a science that looks at the Earth's crust
- Hammock (HAM·muck): land with hardwood trees growing on it
- Limnology (limb·NALL·ă·g): the study of fresh waters
- Mangrove (MAN·grove): a type of tropical tree that grows in swamps
- Marine (mă·REEN): related to the sea or ocean
- Marsh (MARSH): low, soft, wet land
- Oceanographer (o·shin·NOG·raw·fir): a scientist who studies the oceans
- Pesticide (PESS·tă·side): a chemical used to kill insects or weeds
- Petrology (pett·TRAWL·ă·g): the study of rocks
- Physicist (FIZZ·ă·cist): a scientist who studies matter and energy
- Primatologist (pry·mă·TALL·ă·jest): a person who studies primates – man, monkeys, apes, etc.
- Refinery (ree·FINE·ēr·ee): a plant that purifies materials such as oil
- Renewable (re·NOO·ă·bull): capable of being replaced
- Rwanda (row·WAN·duh): a country in east central Africa
- Slough (SLEW): a place full of soft, deep mud
- Swamp (SWAMP): wet, spongy land
- Wetlands (WET·lands): land areas wet at least some of the year



## Quick Quiz – Match the Woman With Her Accomplishment

Many women have contributed to various fields of science and to improving the environment. Place the letter of the woman in the space in front of her numbered accomplishment.

- A. Rachel Carson
- B. Ellen Swallow Richards
- C. Sylvia Alice Earle
- D. Ruth Patrick
- E. Catherine Furbish
- F. Dian Fossey
- G. Marjory Stoneman Douglas
- H. Florence Bascom
- I. Maria Goeppert-Mayer

- \_\_\_\_\_ 1. She was a geologist. She studied how rocks are formed.
- \_\_\_\_\_ 2. She helped save the Everglades. The Everglades are in Florida.
- \_\_\_\_\_ 3. She was a botanist. She started studying plants when she was 12 years old. She studied plants in Maine for 35 years.
- \_\_\_\_\_ 4. She was a physicist. She studied atoms. In 1963, she won the Nobel Prize.
- \_\_\_\_\_ 5. She was a biologist. In 1962, she wrote a book titled *Silent Spring*.
- \_\_\_\_\_ 6. She was a primatologist. She studied gorillas. She lived in Rwanda.
- \_\_\_\_\_ 7. She was concerned about water. She studied inland water. She linked the types of plants in water to water pollution.
- \_\_\_\_\_ 8. She is a marine biologist and oceanographer. She has even lived underwater.
- \_\_\_\_\_ 9. She was a chemist. She looked at many water samples. She made the first water purity tables. She made the first state water quality standards in the U.S. She is called the “Mother of Ecology.”



ANSWERS:

Additional information on all of these women is contained within the book *Her Story: A Timeline of the Women Who Changed America* (HarperCollins, 2008) by Charlotte S. Waisman and Jill S. Tietjen.

Let's see how you did.

1. H
2. G
3. E
4. I
5. A
6. F
7. D
8. C
9. B