

Longwood Gardens Community Read

Activities for

Women in Science

By Rachel Ignatofsky

Meets the following standards of the
Pennsylvania Department of Education (grades 6-8):

Environment and Ecology

- 4.3 Natural Resources
- 4.5 Humans and The Environment

History

- 8.4 World History

Science

- 3.1.B Genetics

English Language Arts

- CC.1.3 Reading Literature – Students read and respond to works of literature – with emphasis on comprehension, making connections among ideas and between texts with a focus on textual evidence

Reading and Writing in Science and Technical Subjects

- CC.3.5 – Reading Informational Text: Students read, understand, and respond to informational text – with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence



Read about *Rachel Carson* on pages 58-59.
Rachel studied the effects of chemicals on the environment.



Image from flickr.com (public domain)

*Try this experiment to see how everyday household products affect plants.
DO ONLY WITH ADULT SUPERVISION

Materials: 2 cut flowers, 2 glasses/vases, dish liquid or laundry detergent.

1. Place one flower in a container of clean water
2. Put the other flower in a container of water mixed with one of the household products listed above.
3. Observe the 2 flowers after 24 hours

What is the effect of household products on plants?

How might these products affect the environment?

How can we solve this environmental issue?



Environment Word Search Worksheet

Directions: All words are positioned left to right, right to left, and diagonally.

C A A T J Q C E Q J Z L I X Y D V U M J E K U
 R L T C J Z H I X Y D V G N H I O S M D S N Y
 L T N M M Y Y L L T O H O B Y O P P I S L O E
 X W S T O H X H K H I I M J D F C C E T I I M
 R P D S U S P F Q X T N S G L W I R Z T J T O
 E R T E O K P U P U S L C C O T E P Y A B U G
 H L K R G V L H L Q W Y J T C H N I G T A L J
 C R M O M Z J O E I Q X P E P M J B L I S L A
 A G I F I C V U L R F J S S O B M L A B D O P
 O P G N J E X E I T E N O Q U G J N B A F P O
 P I P I Z W N D G M I I U H O R R O N H J J A
 D T N A P J F C J V B M U H I E Z O R J G Y V
 E K W R E N D A N G E R E D S P E C I E S P
 A D M B Y O X C O N S E R V A T I O N D Q F W
 W C N R L D E S U U G I Z S B S J F I L X S B
 J A F J O C O Z O N E M G B K X L L S Y M M U
 W T M U B P R R Q B A W F Z V X A D Q L V G N
 G F K H T V S B Q Y K Q W Q H L G B H L Z W A

BIOSPHERE	INSECTICIDE	POLLUTION	EXTINCT
ENDANGERED SPECIES	RAINFOREST	POACHER	
ATMOSPHERE	SMOG	CONSERVATION	
EVOLUTION	OZONE	HABITAT	

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Community Read
Read. Think. Engage.

Read about *Mary Agnes Chase* on pages 30-31.
Mary was a botanist who experimented with grass.

Try this activity.

Materials: planter, soil, 4 packets of different types of lawn grass seed (recommendations below), pen, labels

- Divide the planter into 4 sections
- Plant one type of grass seed in each section
- Place in a sunny area
- Water regularly
- Observe as the grasses grow and note the characteristics of each type of grass

	Perennial Ryegrass	Hard Fescue	Kentucky Bluegrass	Turf-type Tall Fescue
Day 5 Observations				
Day 10 Observations				
Day 15 Observations				
Day 20 Observations				
Day 25 Observations				
Day 30 Observations				

Which grass grew first?

Why do you think the grasses grew at different rates?



Read about *Marjory Stoneman Douglas* on pages 42-43.

Marjory knew the importance of conservation. When you are conserving something, you are protecting it. She protected the Everglades in Florida.



Image from the National Park Service (public domain)

What can you do to conserve a woodland or stream?

What can you do to conserve your own back yard?

Think about how the things you do inside your house.

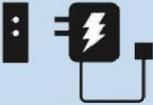
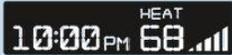
How could they affect the world around you?

Complete the checklist on the next page.



THE EASY ENERGY ACTION PLAN CHECKLIST

10 SIMPLE WAYS TO USE ENERGY WISELY

		CHECK THE BOX
1	 Turn off lights.	<input type="checkbox"/>
2	 Use energy-saving light bulbs.	<input type="checkbox"/>
3	Shut off computers. 	<input type="checkbox"/>
4	 Use "smart" power strips.	<input type="checkbox"/>
5	Turn off entertainment devices when not in use (TV, game systems, etc.). 	<input type="checkbox"/>
6	 Use natural light, heat and cooling.	<input type="checkbox"/>
7	Unplug chargers when not in use. 	<input type="checkbox"/>
8	 Talk to your parents about ENERGY STAR [®] appliances.	<input type="checkbox"/>
9	Talk to your parents about programmable digital thermostats. 	<input type="checkbox"/>
10	 Talk to your parents about home improvements to save energy such as windows, doors, and roofs.	<input type="checkbox"/>



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

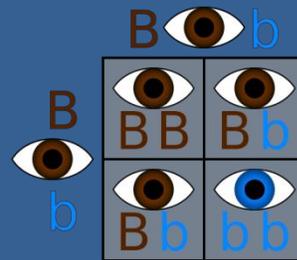
<http://go.usa.gov/DVuQ>

Read about *Barbara McClintock* on pages 52-53

Barbara did experiments with the genetics of corn.

A Punnett Square is a diagram that is used to predict an outcome of a particular cross or breeding experiment. Capital letters are used to show the **dominant**, or stronger trait and lower case letters represent the **recessive**, or weaker trait.

Punnett Square showing probability of two parents with brown eyes having a blue eyed baby (only bb=blue)



https://commons.wikimedia.org/wiki/File:Punnett_hetero_x_hetero.svg

Complete the Punnett squares below to see how genetics plays a part in plant characteristics.

Purple is stronger, or dominant, over white for flowers.

P = purple

w = white

	P	w
P		
w		

What kind of flowers would grow from two purple flowers?



Community Read

Read. Think. Engage.

With beans, yellow is stronger, or dominant, over green.

Y = yellow

g = green

	g	g
Y		
Y		

What are the chances of a green bean and a yellow bean creating a yellow bean?



Scientists use a variety of tools in their work. Some are shown in the Lab Tools section on pages 60-61.

In the book, find a scientist you'd like to know more about. After reading about her, look at the tools she used. Find the names of the tools on pages 60-61 and write them on the chart below.

Name of Scientist _____
<u>Tool #1</u>
<u>Tool #2</u>
<u>Tool #3</u>
<u>Tool #4</u>
<u>Tool #5</u>



Choose one scientist in **Women in Science**. *Before reading the pages*, look carefully at the illustrations on both pages. List what you see. Based on those objects, what do you think her job was? Read to see how she used all these objects.

Pages _____ Scientist's Name _____

Objects observed:

Prediction about her job: _____

Three things you learned about her after reading:

- 1.
- 2.
- 3.





Research Specialist (and former intern) in the Horticulture department at Longwood Gardens.

All of the women in **Women in Science** started out doing something they loved. They asked questions and continued exploring.

What are you passionate about?

Where could your passion lead you?

The next great scientist could be you!!!

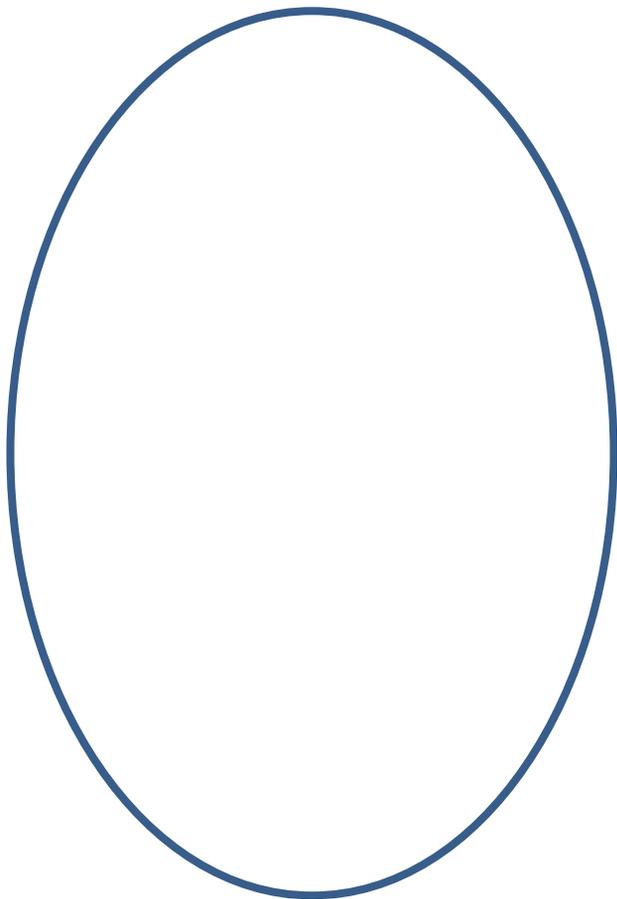
Complete the next page about yourself. Envision that this is your page in the book! Use the same illustration style as in Women in Science.



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[Draw a picture of yourself]

[don't forget to illustrate the sides]



[write your quotation (something you really believe) here]

[explain your passion, exploration, inspiration, and dreams]



Women in Science – Scavenger Hunt



Longwood Gardens Student in Plant Research area

1. Use the Table of Contents to find how many of these scientists are still alive.
What is the name of one of these women?
What is her area of science?
2. Use the Timeline on pages 32-33.
Who was the first woman to win a Nobel Prize?
What year did she receive the prize?
What was the Nobel Prize awarded for?
(Read about this woman – use the index to find the page number!)
3. Use the graphs on pages 84-85.
What percentage of the STEM (Science, Technology, Engineering, Math) work force in 2011 were women?
4. Use the graphs on pages 84-85.
What STEM area saw the largest growth for women from 1970-2011?
5. Use the Glossary on pages 118-121 to find the meaning of ergonomics
Who is the woman who studied ergonomics? (use the Index)
6. What type of scientist is Joan Beauchamp Proctor? Where did she live?



7. Using the illustrations and captions on page 93, find out what honor Sylvia Earle was given in 1998.
8. Which of the Websites listed on page 123 would give you information on outer space?
9. Find 2 facts about the author, Rachel Ignatofsky (page 125).
10. What is Rachel Ignatofsky telling you to **do** in her Conclusion on page 117?



Women in Science: Suggested Reading List

Primary Books: Kindergarten–Third Grade

Marie Curie: Prize-Winning Scientist (Biographies)

By Lori Mortensen, illustrated by Susan Jaekel
Picture Window Books (2008)

Life in the Ocean: The Story of Oceanographer Sylvia Earle

By Claire A. Nivola
Farrar, Straus and Giroux (BYR) (2012)

Maria Mitchell (Great Women in History)

By Anna Butzer
Pebble Books (2014)

Intermediate Books: Fourth–Sixth Grade

The sky's the limit: stories of discovery by women and girls

By Catherine Thimmesh, illustrated by Melissa Sweet
Houghton Mifflin (2002)
Reading level: intermediate

Untamed: The Wild Life of Jane Goodall

By Anita Silvey, foreword by Jane Goodall
National Geographic Children's Books (2015)

Dive! my adventures in the deep frontier

By Sylvia A. Earle
National Geographic Society (1999)



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Middle Level Books: Middle School

Mae Jemison

By LeeAnne Gelletly
Chelsea House Publishers (2002)

My life with the chimpanzees

By Jane Goodall
Pocket Books (1996)

Almost astronauts: the true story of the “Mercury 13” women

By Tanya Lee Stone
Candlewick Press (2009)

Hidden from history: the lives of eight American women scientists

By Kim K. Zach
Avisson Press (2002)



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