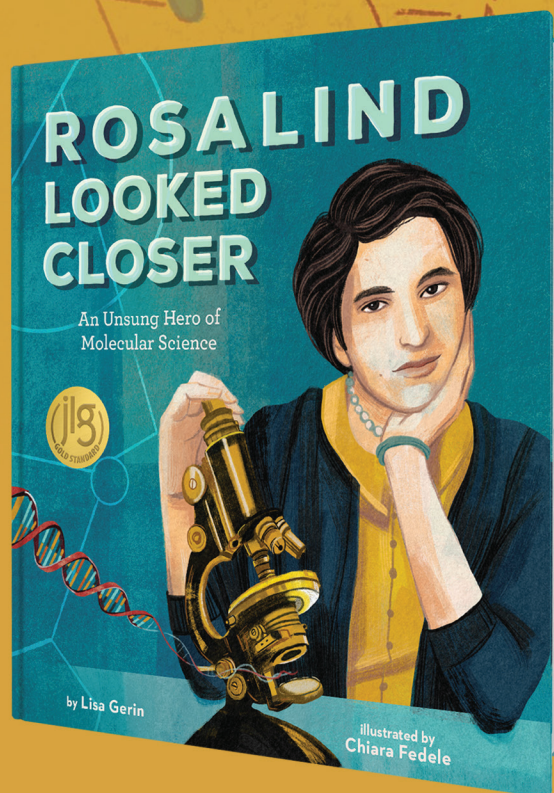


# ROSALIND LOOKED CLOSER

by Lisa Gerin

illustrated by  
Chiara Fedele



## EDUCATOR'S GUIDE

### NOTE TO EDUCATORS

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This classroom guide is designed for students in first through fifth grade. It is assumed that teachers will adapt each activity to fit the needs and abilities of their own students. It offers activities to help teachers integrate *Rosalind Looked Closer: An Unsung Hero of Molecular Science* into English language arts (ELA), science, and social studies curricula. All activities were created in conjunction with relevant content standards in ELA and science.

The book's backmatter includes an author's note with more information about Rosalind, a glossary, and a timeline that will help set the historical backdrop of the time period in which Rosalind lived.

### ABOUT THE BOOK

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As a Jewish girl in England, Rosalind Franklin grew up against the backdrop of World War II. Fascinated with the natural world, as well as the invisible world that she could only see through her microscope, Rosalind developed a passion for science during a time when few women were recognized for their contributions to the field. The themes in the book tie in with International Day of Women and Girls in Science on February 11, Women's History Month in March, and DNA Day on April 25.



## ABOUT THE AUTHOR AND ILLUSTRATOR

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**LISA GERIN** is a former elementary librarian and high school teacher with a master's degree in education. She had a satisfying career working with children, teaching reading, and writing for grades PreK through 12. Lisa now writes nonfiction picture books. She lives in Tucson, Arizona, but was raised in New York City. Lisa loves animals and nature, especially her rescue kittens, Thor and Cleo. ***Rosalind Looked Closer*** is her debut picture book.



**CHIARA FEDELE** is an Italian illustrator, born in Milan and now living in the country. She has a degree in illustration and has worked for publishers around the world since 2004. Her illustrations, a mix of traditional and digital, are characterized by strong gestural features that create an emotional texture completed by a strong chromatic sensitivity. She is also the illustrator of ***A Fall Ball for All***, by Jamie A. Swenson; ***The Brave Cyclist***, by Amalia Hoffman; and ***When Rosa Parks Went Fishing***, by Rachel Ruiz.

## STANDARDS FOR LITERACY AND SCIENCE

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### Aligned for Grades 1–5 Common Core ELA and Next Generation Science Standards

**1st grade:** CCSS: ELA.RL.1.1,2,3,5,7; RI.1.1,2,3,4,6,7,8,9; W.1.2,3; SL.1.1,2; L.1.1,2,4;  
NGSS: 1-PS4-1,4; K-2-ETS1-1,2,3

**2nd grade:** CCSS: ELA.RL.2.1,3,5,6,7; RI.2.1,2,3,4,6,8,9; W.2.1,2,3; SL.2.1,2,5; L.2.1,2,3,4;  
NGSS: 2-PS1-2; K-2-ETS1-1,2,3

**3rd grade:** CCSS: ELA.RL.3.1,3,4,7; RI.3.1,2,3,4,6,7; W.3.1,2,3,4,7,8; SL.3.1,2,3,4,5; L.3.1,2,3,4;  
NGSS: 3-5-ETS1-1,2,3

**4th grade:** CCSS: ELA.RL.4.1,2,3,4,6; RI.4.1,2,3,4; W.4.1,2,3,4,7; SL.4.1,2,5; L.4.1,2,3,4;  
NGSS: 4-PS3-2; 4-PS4-1,3; 3-5-ETS1-1,2,3

**5th grade:** CCSS: ELA.RL.5.1,2,3,4,6; RI.5.1,2,3,4; W.5.1,2,3,4,7; SL.5.1,2,5; L.5.1,2,3,4;  
NGSS: 3-5-ETS1-1,2,3



# PRE-READING ACTIVITIES

## BOOK COVER

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- Describe what you see on the book's cover. Name the author/illustrator.
- What can you tell about Rosalind by looking at her face?
- Name some scientists you know. Can you name any female scientists? Make a class list.
- What do you think Rosalind might be looking closer at?
- Do you think this book will be fiction or nonfiction? Explain why.

## VOCABULARY TO KNOW

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MICROSCOPE

DNA

VIRUS

VACCINE

## DNA WEBSITES/VIDEOS FOR KIDS

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- Biology for Kids: DNA and Genes (ducksters.com)
- Video – National Science Foundation Chalk Talk: What Is DNA? [https://youtu.be/M\\_GOvofggl4](https://youtu.be/M_GOvofggl4)
- Video – What Is DNA for Kids: <https://youtu.be/921XdtoRAoo>
- Home – DNA Day



# POST-READING ACTIVITIES

## DISCUSS

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- Name one of Rosalind's scientific discoveries.
- What did you like about her life story?
- Are female scientists treated the same way today as during Rosalind's lifetime?
- What is your dream job for when you are grown up?
- What were some obstacles Rosalind faced in achieving her dream of becoming a scientist?

## MAKING CONNECTIONS

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### Language Arts/Writing Activities:

**Grades K-1:** See attached worksheet about women scientists.

**Grades 2-5:** Write a mini report about one of the following female inventors/scientists. How were they similar to or different from Rosalind?

- Marie Curie
- Patricia Bath
- Madame C. J. Walker
- Ada Lovelace

**Grades 3-5:** Write a play with dialog (script) based on the book. Act it out with students playing the characters.

**Science Activity:** Build Your Own DNA Model (see instructions below)



# WORKSHEET FOR KINDERGARTEN AND FIRST GRADE WOMEN IN SCIENCE

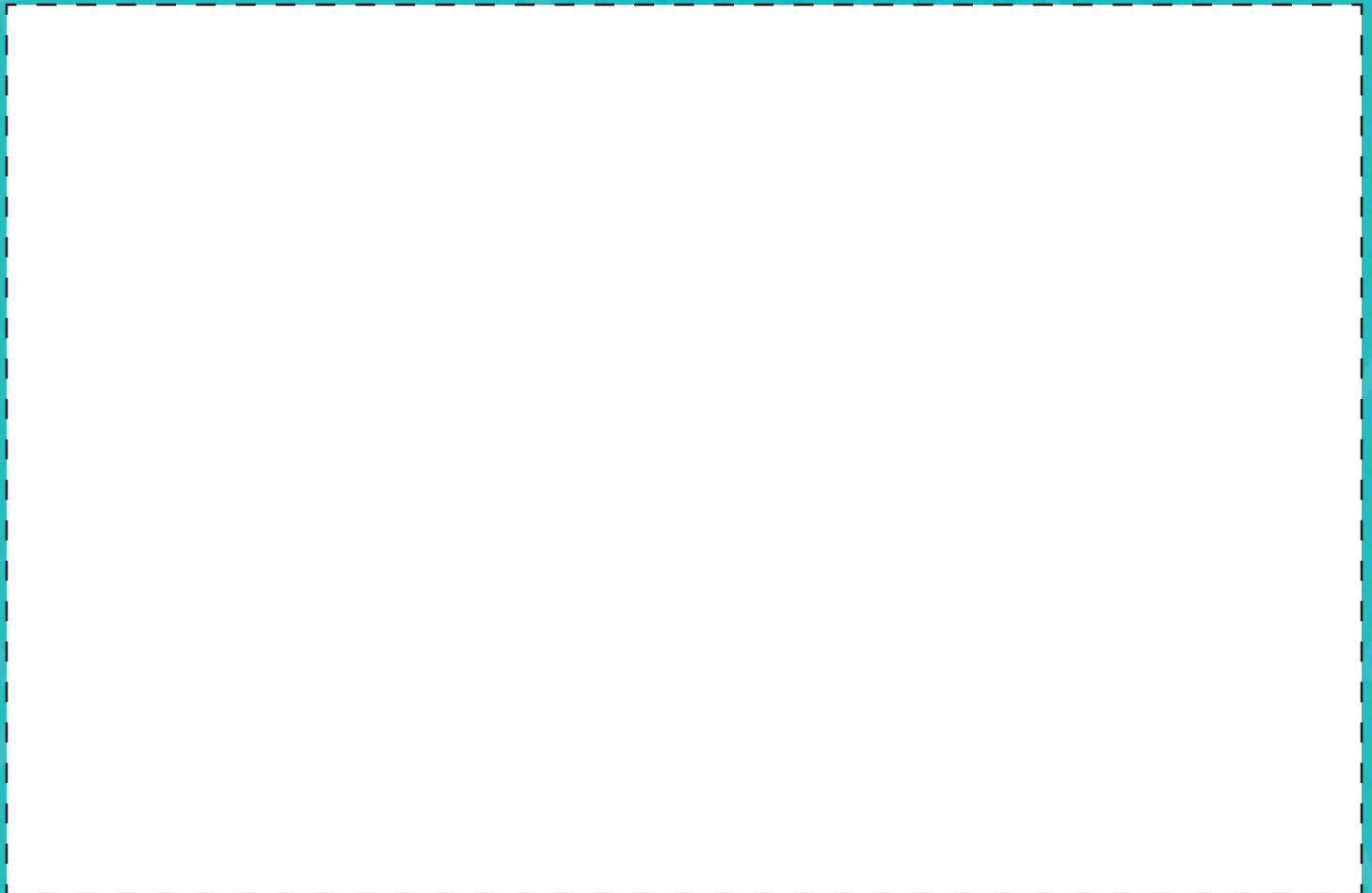
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Your Name: \_\_\_\_\_

Class: \_\_\_\_\_

Date: \_\_\_\_\_

Draw a picture of what you think a woman scientist looks like below. Include some details from the story *Rosalind Looked Closer* in your drawing.





# BUILD A DNA MODEL WITH PIPE CLEANERS

## MATERIALS

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- Pipe cleaners – two each of at least five different colors
- Ruler to measure 2-inch segments of pipe cleaner
- Scissors to cut the pipe cleaners
- Pen and paper to make labels

## 1. PREPARE YOUR MATERIALS

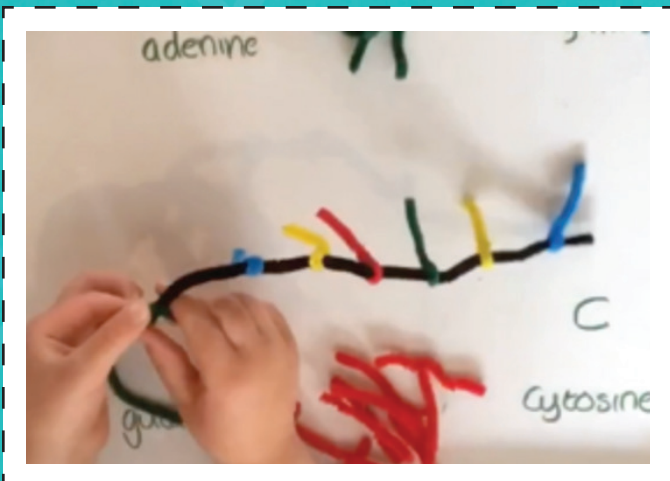
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- Choose a color for your DNA backbone (we chose black)
- Choose four colors for your DNA bases (we chose blue, green, red, and yellow)
- Set aside the pipe cleaners for the backbone
- Cut the pipe cleaners for your bases into segments around 2 inches long
- Make four piles of bases and add a label to each: adenine, guanine, cytosine, thymine (or you can use A, G, C, T)

## 2. BUILD THE FIRST STRAND OF DNA

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- Give one of the DNA backbone pipe cleaners to the child and show them how to twist bases onto it at regular intervals.
- Let them complete this first strand. They can choose any bases in any order. If they want a longer molecule, twist additional backbone strands together and continue twisting bases onto the backbone.



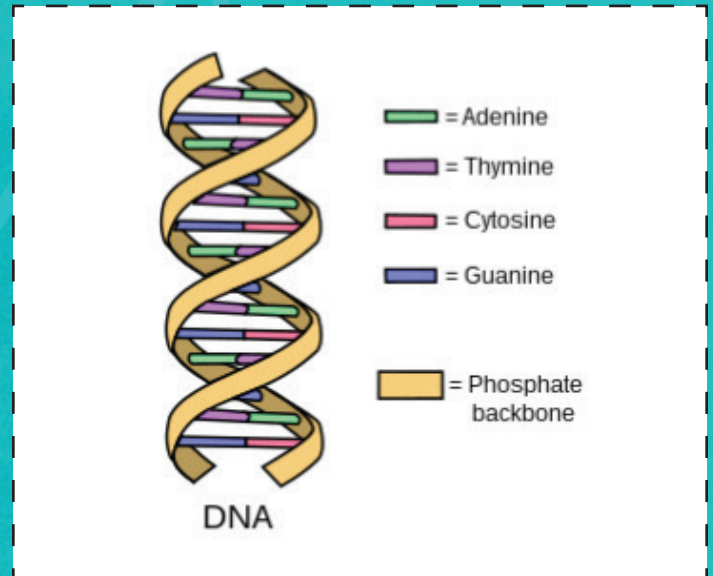
(<https://www.palebluemarbles.com/build-a-dna-model-with-pipe-cleaners/>)



# BUILD A DNA MODEL WITH PIPE CLEANERS CONT.

## 3. BUILD THE SECOND DNA STRAND

- Now take the child through the DNA base-pairing rules:
  - A always pairs with T (and vice versa)
  - G always pairs with C (and vice versa)
- Now give the child another backbone pipe cleaner.
- Let them twist bases onto the second strand, **using the first strand as a guide and following the base-pairing rules.**
  - For example, if they made the first strand with A-C-G-T-T-A, they would need the second strand to have T-G-C-A-A-T.



(Credit: Forluvoft, Public domain, via Wikimedia Commons)

## 4. MAKE A DOUBLE HELIX

- Once the child has completed the second strand, they can zip up the DNA by twisting the base pairs together.
- Show them how to make a right-handed double helix by twisting the backbone: Holding the top with your left hand and the bottom with your right, twist your right hand to the right and your left hand to the left.
- Your DNA model is complete!



(<https://www.palebluemarbles.com/build-a-dna-model-with-pipe-cleaners/>)