

## SECRET CODERS

BY GENE LUEN YANG & MIKE HOLMES

### EDUCATION RESOURCE GUIDE: DISCUSSION QUESTIONS AND ACTIVITIES

Secret Coders is a graphic novel series by Gene Luen Yang and Mike Holmes that combines logic puzzles and basic programming instruction with a page-turning mystery plot. The series is recommended for readers in grades 3 through 8 and includes four books:

- *Secret Coders*
- *Secret Coders: Paths & Portals*
- *Secret Coders: Secrets & Sequences*
- *Secret Coders: Robots & Repeats*

If you are uncertain whether the Secret Coders series is right for the young people in your life, take a moment to read “[5 Reasons You Should Be Reading Secret Coders](#)” by Graeme McMillan in WIRED. His five reasons are as follows:

- You’ll Be Learning Coding from a Professional.
- Secret Coders Might Be Educational, But It’s Not Boring.
- Code: It’s Not Just for Computers Anymore.
- Comics’ Hidden Superpower, Pedagogy!
- You’ll Enjoy It—But It Might Change Your Kid’s Life.

Read the entire article at this link:

<https://www.wired.com/2016/05/secret-coders-essentials/>

## DISCUSSION QUESTIONS

Pose the following questions to young people:

- *Secret Coders* opens with protagonist Hopper being dropped off at her new school, Stately Academy, for the first time. Hopper says she “downright dreaded transferring to Stately Academy.” Have you ever moved and needed to transfer to a new school? Did you dread the experience or were you excited about it? Even if you have never needed to change schools, write a list of what might worry you and what might excite you about making such a transition. Think about other transitions you might have made in your life, such as starting on a new sports team or joining a new club in which all the other kids already know each other.
- Hopper describes her new school as looking like a “haunted house.” How does that description affect the story? Does the accompanying illustration of her school match that description? If not, how would you describe the school? Is there anything about your own school that makes you think of a haunted house? Consider not only what your school looks like but your experiences at school.
- The setting for each of the *Secret Coders* books is primarily Stately Academy. Can you think of other stories in which the action takes place in a school? (Examples: *Ivan the Terrible*, Harry Potter series, *The Magic School Bus* series, *Big Nate* series, *Princess Academy*) Is a school typically a setting in which good or bad things happen or both? Cite examples from stories you know.
- The *Secret Coders* books are **graphic novels**. A graphic novel is a story presented in the format of a comic book. Graphic novels can include fiction and nonfiction. Make a list of how comic books and graphic novels are similar and how they are different. What other graphic novels have you read? Do you prefer reading a graphic novel to a standard book with no or with limited illustrations? Why or why not?
- *Secret Coders* includes bird robots and a robot turtle! The robot birds attack when they are shown the number 15. What other purpose do the robot birds serve? What tasks do they perform? The robot turtle can run a program to clear the sidewalk. What other tasks can it perform? How is the robot turtle important to the story?
- Have you ever read a book or story that featured a robot? What types of tasks do the robots in other books or cartoons or movies perform? Do the robots in other stories perform jobs that humans could not do because they are too dangerous? Or do they perform jobs that humans prefer not to do?
- If you could have a robot, what types of tasks would you want it to do for you? If you could program a robot, would you want it to recognize binary numbers (like the robot birds) using its “eyes” or to execute a program when you speak the command (such as “Clear Sidewalk” or “Open Sesame”)? What other ways could you communicate with a robot to instruct it to do what you want?

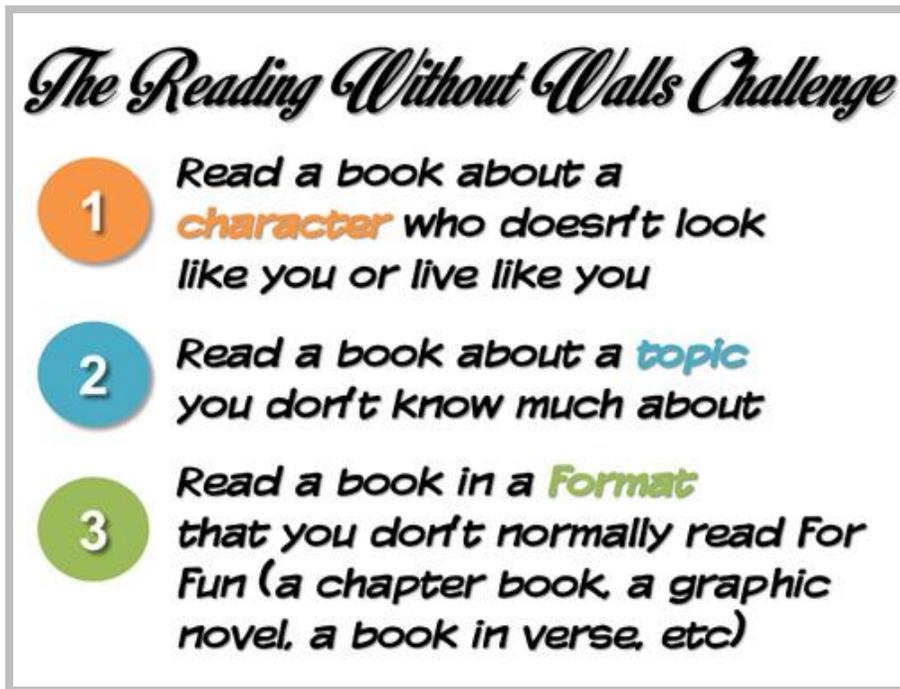
- Gene Luen Yang has said the following about the *Secret Coders* series, “I wanted to combine both narrative and educational goals into a single project. I wanted the readers to connect with the characters, and I wanted the characters to be three-dimensional—with flaws and desires that the readers could identify with, so that could carry them through the educational portion.” Ask students to make a list of the primary and secondary characters in the book and to list characteristics for each. What flaws does each character have? What are the characters’ strengths? Do students recognize any of the weaknesses and strengths in themselves?
- *Secret Coders*, the first book in the series, ends with Hopper, Eni, and Josh being required to solve a puzzle by writing a program so they can learn the secret of Stately Academy. What do you think about the ending? Will you try your hand at writing the Path Portal program? Are you eager to find out what happens in the next book? What do you think the secret of their school is?
- Gene Luen Yang wants kids to learn as much as they can about people and the world through books, “Specifically, I want them to read books about people who don’t necessarily look like or live like them. I want them to read books in a variety of different formats—prose, books in verse, and comic books—and finally, I want people to pick topics that they might find intimidating. I know a lot of kids find the inner working of computers intimidating, and I hope *Secret Coders* will help them with that.” Did you know much about how computers and robots are coded before you read *Secret Coders*? After reading it, do you understand what *binary* means and what it means to write a *computer program*? If you are still unsure about what these concepts mean and how they work, do you feel like you understand them a little bit better after having read *Secret Coders*? Why or why not?

## ACTIVITY: READING WITHOUT WALLS

Gene Luen Yang is serving as the fifth [National Ambassador for Young People’s Literature](#), a position appointed by the [Library of Congress](#), [Children’s Book Council](#), and [Every Child A Reader](#). His two-year term is 2016-2017.

Each National Ambassador chooses a platform. Yang chose “Reading Without Walls.” About this platform, Yang states, “I want every kid—every reader, really—to explore the world through books. Books have played a vital role in getting me outside of my comfort zone. I believe they can do the same for you.”

To implement these words, Gene Luen Yang challenges all readers to read without walls in one of three ways:



Have young people write a list of books they have read that meet one or more of the three criteria. Once they have written their lists, ask each student to share the name of his or her favorite book on the list and explain how it meets one or more of Yang’s criteria. Ask students to write down the titles of books that appeal to them based on their classmates’ recommendations.

Take your students to the library—or encourage them to visit their local library with a family member—to check out one or more of the books recommended. Another excellent resource is the librarian. Encourage students to introduce themselves to the librarian and ask for his or her recommendations for books that meet the “Reading Without Walls” challenge.

Provide students with a timeline of when they should finish their books. At that time, ask each student to write or present an oral report summarizing the book and explaining if and how the book “took them out of the comfort zones.”

## ACTIVITY: CARTOONING

A *cartoon* is an illustration drawn in a non-realistic or semi-realistic artistic style. Cartoons are often simple drawings that show the features of their subjects—such as people or animals—in a humorously exaggerated way. *Cartooning* as a drawing style is often used in creating comic strips and graphic novels. Anyone can try their hand at drawing a cartoon using pens, pencils, markers, or even a graphic design program.

### What's the Difference?

- A **cartoon** is a single panel image usually used to convey an idea. Cartoons are published in newspapers, magazines, and websites.
- A **comic book** is “a book of cartoons collected in strips or panels and telling unified stories about characters or groups of characters. Originally designed as humorous, comic books became increasingly serious after 1935, eventually reaching the stage of the graphic novel.” A comic book is a periodical, often published monthly.
- A **graphic novel** “is a story, most often Fantasy or Science Fiction, presented in the format of a comic book. After 1975 graphic novels became increasingly serious and subtle, and some were as well-produced as standard books and magazines.” Graphic novels are published and read as books.

### Discussion Questions

Pose the following questions to young people:

- Read the definitions of *cartoon*, *comic book*, and *graphic novel*. Ask students to list examples of each. Compare the lists with the class. Do some works seem to fit into more than one category? If so, why?
- Ask young people to look closely at the cartoon illustrations in *Secret Coders*:
  - Look at the illustrations of Hopper, Eni, and Josh. Are these realistic drawings or not? Are any of their features exaggerated? Which features? Are any facial features amplified more when the characters are laughing or screaming? How does that inform the story?
  - Some of the cartoon panels include illustrations with no words. Ask students to find examples. How does the illustration show what is happening without words?
  - How do the robot birds look like real birds...or not?
  - In what ways does the robot turtle look like a real turtle? Even though it is a robot, would you have easily recognized it as being modeled after a turtle? What features look more human than turtle-like?



## Create a Cartoon Animal and Feature It in a Comic Strip

Follow these steps to encourage young people to develop their own concept for a cartoon animal and then feature it in a comic strip.

1. Ask young people to think about an animal they would like to draw as a cartoon. The animal could be a pet at home, a wild animal that lives in their yard or neighborhood, or a wild animal that lives in a completely different habitat on another continent.
2. Whichever animal they choose, ask them to start by drawing a simple sketch—this could be a realistic portrayal or not. Guide your students to choose their own method for drawing the animal. For example, if they want to draw a mouse, ask them to draw the mouse so that it does not look like Mickey Mouse.
3. Ask young people to collect animal photographs from old magazines and create a large photo reference scrap book as a drawing resource. Include as many photographs of animals in action as they can. They can start making drawings based on the photographs. At first, encourage them to make quick sketches using loose circles and ovals to delineate heads, appendages, and body parts. They should not worry about details or if these first sketches look anything at all like the animals.
4. Students also need to watch their selected animal in motion—at home, in the backyard, at the local park, at the zoo, or on TV or YouTube videos. Encourage them to take a sketchbook or a small pad of paper so they can sketch the animal in different poses, thinking about what features they might like to highlight in their finished cartoon.
5. Ask students to write a list of characteristics that describe their animal and its behavior. Is their animal happy, active, sleepy, loud, awkward, athletic? Does their animal talk? Does it convey thoughts and emotions through facial expressions and/or actions? If their animal is a four-legged creature, will it walk on two legs or all four?
6. Having watched the animal in motion and studied photographs, ask students to begin sketching their **cartoon version** of the animal. Are there features of the animal they might want to exaggerate? Consider enlarging the animal's eyes or ears or tail—or some other feature. Encourage students to draw several versions and choose the one they like best to become their final cartoon concept.
7. Once students have finalized their cartoon concept of their chosen animal, ask them to experiment with drawing the cartoon animal in action—sleeping, running, screaming, jumping—whatever actions are appropriate. The action sequences do not have to be limited to the animal's natural habitat because this is a cartoon. Encourage your students to let their imaginations soar—their cartoon moose may find its way to the city, their cartoon kangaroo might have jumped onto the back of a plane and landed in Florida, or their cartoon penguin may simply enjoy its adventures in Antarctica.
8. Using the action sequences as inspiration, ask the students to create a complete story of comic strips or panels featuring their cartoon animal. Young people may decide how many pages to create, but remember every story has a beginning, middle, and end. Student can choose to include dialog or captions...or to let their cartoon illustrations tell the story! You may want to use the "[Make a Comic](#)" instructions as a resource.
9. If possible, copy each student's comic strip and publish as a book. Or, consider posting comic strips on the bulletin board or scanning and publishing on a class website.

## Lesson Plans

You may want to expand upon the Cartooning exercise, or create and customize your own, using information from the following sources:

- “Make a Comic” by the Center for Cartoon Studies and Scholastic Art Magazine provides step-by-step instructions that include illustrations to help explain the process. [http://art.scholastic.com/resource/uploads\\_art/Issues/1111/ART-1111-pp14-15.pdf](http://art.scholastic.com/resource/uploads_art/Issues/1111/ART-1111-pp14-15.pdf)
- “Creating Comics and Cartoons” on ReadWriteThink.org <http://www.readwritethink.org/parent-afterschool-resources/activities-projects/creating-comics-cartoons-30291.html>
- “Comics and Graphic Novels” on ReadWriteThink.org for Grades 6-8 <http://www.readwritethink.org/parent-afterschool-resources/activities-projects/comics-graphic-novels-30296.html>
- “Comic Book Show and Tell” on ReadWriteThink.org for Grades 9-12 <http://www.readwritethink.org/parent-afterschool-resources/activities-projects/comic-book-show-tell-a-30312.html>
- “Comic Creator” software tool on ReadWriteThink.org invites children and teens to design their own comic strips. Their creations can be just for fun or as part of more structural learning activities: planning writing activities, before- and after-reading activities, and responding to books. <http://www.readwritethink.org/parent-afterschool-resources/games-tools/comic-creator-a-30237.html>
- “Learn to Draw a Cartoon Character” on Instructables.com <http://www.instructables.com/id/Learn-to-Draw-a-Cartoon-Character/>

## Sources

- *A Handbook to Literature* by William Harmon and Hugh Holman. Pearson/Prentice Hall: New Jersey, 2006.
- “Talk Art! James Ransome’s Illustration for Episode Six of *The Exquisite Corpse Adventure*” by Mary Brigid Barret. [http://www.thencbla.org/Exquisite\\_Corpse/exquisite\\_ep6.html](http://www.thencbla.org/Exquisite_Corpse/exquisite_ep6.html)
- <http://www.differencebetween.com/difference-between-cartoon-and-vs-comic/>
- <https://en.oxforddictionaries.com/definition/cartoon>

## **ACTIVITY: GET WITH THE PROGRAM!**

You can expand the educational potential of the Secret Coders books using the complementary and kid-friendly website [Secret-Coders.com](http://Secret-Coders.com), which includes more information about the creators and the books' characters, an art gallery, "Fun with Coding" activities, as well as video instructions that teach young people how to code.

For students who are interested in trying to understand binary code and computer programming, be sure to check out the videos on the [LEARN TO CODE](#) page.

On the [ACTIVITIES](#) page, you can download and print the binary numbers game (as played by Hopper and Eni in the book and shown below), as well as a coding puzzle.

# SECRET CODERS

Learn how binary numbers work by playing the same game Hopper and Eni play in *Secret Coders Book 1!*

1. Start with seven pennies.
2. Fit all seven pennies into the boxes, but there's a catch! Every column of boxes has to be either completely full or completely empty. No half-filled columns.
3. When you're done, write a zero on the line beneath each empty column. Write a one on the line beneath each empty column.
4. The result is seven as a binary number! (Turn this page upside down to see the answer.)
5. Try it with other numbers too! This game will work with any number that's fifteen or smaller.

If you want to use numbers bigger than fifteen, you'll need to add more columns to the left. (And you'll need bigger paper!) The next column will have 16 boxes, the one after that 32, and so on. Each column will have twice as many boxes as the column to its right.

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For more coding-related fun, visit [secret-coders.com](http://secret-coders.com)!

In binary, seven is 0111

## ONLINE EDUCATIONAL RESOURCES

The following online resources provide information related to graphic novels and comics:

### Comics in Education by Gene Luen Yang

Created by high school teacher, cartoonist, and National Ambassador for Young People’s Literature Gene Luen Yang, the [HumbleComics.com](http://HumbleComics.com) website presents a history of how comics can be used in the classroom, the positive outcomes, and an extensive bibliography. According to Yang, “The educational potential of comics has yet to be fully realized. While other media such as film, theater, and music have found their place within the American educational establishment, comics has not.”

### Articles and Interviews by Brigid Alverson

Brigid Alverson writes about comics and graphic novels for *School Library Journal*. She is the editor of the *Good Comics for Kids* blog and has been reading comics since she was four. She has an MFA in printmaking and has worked as a book editor and a newspaper reporter; now she is assistant to the mayor of Melrose, Massachusetts. In addition to editing GC4K, she writes about comics and graphic novels at MangaBlog, SLJTeen, Publishers Weekly Comics World, Comic Book Resources, MTV Geek, and Good E-Reader.com.

- “Teaching With Graphic Novels”  
<http://www.slj.com/2014/09/books-media/the-graphic-advantage-teaching-with-graphic-novels/>
- “Good Comics for Kids”  
<http://talkingwithtim.com/wordpress/2008/07/16/brigid-alverson-on-good-comics-for-kids/>
- “Just Another Day in an LGBTQ Comic”  
<http://www.slj.com/2017/05/diversity/just-another-day-in-an-lgbtq-comic/>
- “The People’s Comics: Using the Graphic Format to Teach About Current Events”  
<http://www.slj.com/2017/08/books-media/the-peoples-comics-using-the-graphic-format-to-teach-about-current-events/>
- “Teaching with Science Comics”  
<http://www.slj.com/2017/06/resources/teaching-with-science-comics/>
- “A nonfiction roundup of Graphic Novels”  
<http://www.slj.com/2017/01/teens-ya/nonfiction-graphic-novels-give-these-to-fans-of-march/>
- “The immigrant experience in graphic novels”  
<http://www.slj.com/2016/08/diversity/graphic-novels-portray-bicultural-america/>
- “Graphic novels that tie in with video games”  
<http://www.slj.com/2016/10/books-media/game-changers-books-based-on-video-games/>
- Brigid Alverson Talk on “Graphic Novels for Kids”  
<http://blogs.slj.com/goodcomicsforkids/2017/05/08/an-introduction-to-graphic-novels-for-children/>
- “Interview: Eric Kallenborn on Graphic Novels in the Classroom”  
<http://blogs.slj.com/goodcomicsforkids/2017/08/16/interview-eric-kallenborn-on-graphic-novels-in-the-classroom/>

## GRAPHIC NOVEL BOOKLISTS

The following online booklists from authoritative sources recommend graphic novels for different age levels:

- “Graphic Novels: Read the Pictures”  
<http://www.readingrockets.org/booklists/graphic-novels-read-pictures>
- “Graphic Novels for Kids: Classroom Ideas, Booklists, and More”  
<http://www.readingrockets.org/article/graphic-novels-kids-classroom-ideas-booklists-and-more>
- “19 Graphic Novels That Engage Students and Keep Them Reading”  
<http://www.readingrockets.org/blogs/aiming-access/19-graphic-novels-engage-students-and-keep-them-reading>
- “Graphic Novels: Selected Titles for Children and Teens”  
<https://ccbc.education.wisc.edu/books/detailListBooks.asp?idBookLists=192>
- “Graphic Novels”  
<https://www.common sense media.org/lists/graphic-novels#>
- “The Best Comics for Your Classroom: A List for All Grade Levels”  
<http://www.graphicclassroom.org/2008/01/best-comics-for-your-classroom-list-for.html>
- “Graphic Novels Reading Lists: 2016 Update”  
<http://www.ala.org/alsc/publications-resources/book-lists/graphicnovels2016>
- “Great Graphic Novels for Middle School”  
<https://www.kirkusreviews.com/lists/great-graphic-novels-middle-school/>
- “Powerful Graphic Novels for Middle School”  
<https://www.edutopia.org/article/powerful-graphic-novels-middle-school>
- “Top 10 Graphic Novels 2015”  
<http://www.slj.com/2015/11/reviews/best-of/top-10-graphic-novels-2015/>
- “Top 10 Graphic Novels 2016”  
<http://www.slj.com/2016/11/reviews/best-of/top-10-graphic-novels-2016/>
- “Comic Relief: Thirty-Nine Graphic Novels that Kids Can’t Resist”  
<http://www.slj.com/2011/07/collection-development/comic-relief-thirty-nine-graphic-novels-that-kids-cant-resist/>
- “Graphic Novels for (Really) Young Readers”  
<http://www.slj.com/2006/03/collection-development/graphic-novels-for-really-young-readers/>

## ARTICLES: USING GRAPHIC NOVELS IN THE CLASSROOM

The following online articles provide information about using comics and graphic novels in the classrooms:

- “Graphic Novels for Young Kids” by Reading Rockets  
<http://www.readingrockets.org/article/graphic-novels-young-kids>
- “Graphic Novel Conversation with ESL Teacher Colleen Dykema”  
<http://www.readingrockets.org/blogs/book-life/graphic-novel-conversion>
- “Using Comics and Graphic Novels in the Classroom” by NCTE  
<http://www.ncte.org/magazine/archives/122031>
- “Eek! Comics in the Classroom” by Linda Starr  
[http://www.educationworld.com/a\\_curr/profdev/profdev105.shtml](http://www.educationworld.com/a_curr/profdev/profdev105.shtml)
- “Comic Book Science in the Classroom” NPR Broadcast with Sarah Hughes  
<http://www.npr.org/templates/story/story.php?storyId=4581832>
- “Hamlet' too hard? Try a comic book” by Teresa Mendez  
<https://www.csmonitor.com/2004/1012/p11s01-legn.html>
- “Graphic Novels in the Classroom: A Teacher Roundtable”  
<https://www.cultofpedagogy.com/teaching-graphic-novels/>
- “Graphic Novels: The Bridge Between Visual and Print Media” by Stan Steiner  
<https://www.literacyworldwide.org/blog/literacy-daily/2017/05/08/graphic-novels-the-bridge-between-visual-and-print-media>

## ONLINE RESOURCES FOR COMIC STRIPS

The following online websites and articles provide lesson plans for creating comic strips.

### Websites

- Comics in the Classroom  
<http://comicsintheclassroom.net/>
- Teaching Comics  
<http://www.teachingcomics.org/>

### Articles and Lesson Plans

- “Comic Strip Creations Lesson Plan”  
<https://www.scholastic.com/teachers/lesson-plans/teaching-content/comic-strip-creations/>
- “Comic Creator”  
<http://www.readwritethink.org/classroom-resources/student-interactives/comic-creator-30021.html?tab=4>
- “Comics in the Classroom as an Introduction to Genre Study”  
<http://www.readwritethink.org/classroom-resources/lesson-plans/comics-classroom-introduction-genre-188.html>
- “Comics in the Classroom as an Introduction to Narrative Structure”  
<http://www.readwritethink.org/classroom-resources/lesson-plans/comics-classroom-introduction-narrative-223.html>
- “Book Report Alternative: Comic Strips and Cartoon Squares”  
<http://www.readwritethink.org/classroom-resources/lesson-plans/book-report-alternative-comic-195.html>
- “Using Cartoons and Comic Strips”  
<http://www.teachingenglish.org.uk/article/using-cartoons-comic-strips>
- “Creating Comic Strips”  
[http://artsedge.kennedy-center.org/educators/lessons/grade-3-4/creating\\_comic\\_strips.aspx](http://artsedge.kennedy-center.org/educators/lessons/grade-3-4/creating_comic_strips.aspx)
- “The Secret in the Cellar: A Written in Bone Forensic Mystery from Colonial America”  
<http://anthropology.si.edu/writteninbone/comic/index.html>
- “Creative Writing Using Comics Lesson Plan”  
<https://eduref.org/lessons/language-arts/wcp0013>

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