Seven Golden Rings
written by Rajani Larocca
illustrated by Archana Sreenivasan

SYNOPSIS

In ancient India, a boy named Bhagat travels to the Rajah’s city, hoping to ensure his family’s prosperity by winning a place at court as a singer. Bhagat carries his family’s entire fortune—a single coin and a chain of Seven Golden Rings—to pay for his lodging. But when the innkeeper demands one ring per night, and every link snipped costs one coin, how can Bhagat both break the chain and avoid overpaying? His inventive solution points the way to an unexpected triumph and offers readers a friendly lesson in binary numbers—the root of all computing.


**BACKGROUND**

**Author’s Note from Rajani Larocca**

“When we first learn about numbers and counting, we use a system called base ten, or decimal. Every number is expressed by a series of digits, and the position of each digit within the number is called its place. In base ten, there are ten possible values for each digit – 0 through 9 – and each additional place in the number increases by a power of ten.

Here’s an example:

The digit 9, in the ones place, tells us there are nine ones in the number. The 5 to its left, in the tens place, tells us there are five tens in the number (five times ten times one, or 50). The 0 tells us how many hundreds (zero times ten times ten, or 0), and the 2, thousands (two times ten times ten times ten, or 2000). And of course, 2000 + 0 + 50 + 9 = 2,059. If we wanted to create a bigger number, we could use a ten thousands place (ten times ten times ten times ten), a hundred thousands place (ten times ten times ten times ten times ten), and on and on.

But there are other ways of thinking about numbers, including base two, or binary. In binary, the place farthest to the right is still the ones place, but the place to its left is the twos (two times one), the third from the right is the fours (two times two), the fourth is the eights (two times two times two), and on and on in powers of two. Moreover, binary allows only two possible values for each digit: 0 or 1. A 1 in a certain place indicates that place is added toward the final number. Thus, the decimal number 2 is written as 10 in base two, with a 1 in the twos place and no ones (2 + 0 = 2). Three in base two is written as 11, with a 1 in the twos place and a 1 in the ones place (2 + 1 = 3). Four is 100, with a 1 in the fours place, no twos, and no ones (4 + 0 + 0 = 4); five is 101, with 1 in the fours place, no twos, and 1 in the ones place (4 + 0 + 1 = 5).

By creating additional places – multiplying the value of the previous place by two each time – we can write any decimal number we want in binary, using only the digits 0 and 1. Here’s the number 21:

The sixteens, fours, and ones digits are all 1, so the numbers sixteen, four, and one are counted toward the total (16 + 4 + 1 = 21). Since the eights and twos digits are both 0s, they are not counted. Can you figure out how to write eight in binary? How about ten? How about twenty-seven?

We can think of Bhagat’s sets of rings as each representing a different binary digit – the single ring representing a 1 in the ones place, the chain with two rings representing a 1 in the twos place, and the chain with four rings representing a 1 in the fours place. Bhagat was able to use those three chains to create every number up to seven. If he had a fourth chain with eight rings, he could have
BEFORE READING

Prereading Focus Questions

(Reading Standards, Craft & Structure, Strand 5 and Integration of Knowledge & Ideas, Strand 7)
(Speaking & Listening Standards, Comprehension & Collaboration, Strands 1 and 2)

Before introducing this book to students, you may wish to develop background knowledge and promote anticipation by posing questions such as the following:

- How do you use math in your everyday life? Think about things that you do in your daily routine. How does math factor into those tasks?

- Was there a time when you took a chance on something? What did you do? What was the end result? Was it worth taking a chance? How are taking chances important in your life?

- What does it mean to be persistent? How do you demonstrate persistence even though something may be challenging? Why is it important to be persistent?

- Was there ever a time you solved a problem creatively? What did you do? Why did you have to solve that particular problem? How did you think quickly?

- What does it mean to have a passion? What are your passion(s)? Why do you like to do that particular activity? Has it helped you think about other things in your life?

- What do you know about coding? Have you ever done coding before on the computer? Do you know how it works?

Exploring the Book

(Reading Standards, Key Ideas & Details, Strand 1; Craft & Structure, Strand 5; and Integration of Knowledge & Ideas, Strand 7)
(Speaking & Listening Standards, Comprehension & Collaboration, Strands 1 and 2)

- Book Title Exploration: Talk about the title of the book, Seven Golden Rings: A Tale of Music and Math. Then ask students what they think this book will most likely be about and whom the book might be about. What do they think might happen? What information do they think they might learn? What makes them think that?

- Read Rajani LaRocca’s Biography: Read about Rajani LaRocca on the jacket back flap as well as on her website (http://www.rajanilarocca.com/). How do you think Rajani LaRocca gets inspired for her books?
Seven Golden Rings
Teacher’s Guide  leeandlow.com/books/seven-golden-rings

• Read Archana Sreenivasan’s Biography: Read about Archana Sreenivasan on the jacket back flap as well as on her website (https://archanasreenivasan.com/). How are her illustrations among the books similar? How are they different?

• Encourage students to stop and jot in their reading notebooks during the read-aloud when they: learn new information, see a powerful image, have an emotional reaction or an idea, have a question, or hear new words.

• Have students quickly write a feeling in their notebooks during reading. After reading, ask students why they wrote down that feeling and have them write a journal entry about it.

Setting a Purpose for Reading
(Reading Standards, Key Ideas & Details; Strands 1–3)
Have students read to find out:
• how does the title fit the theme of the story?
• why Bhagat had to audition for the rajah’s royal troupe
• how Bhagat used creative problem solving to pay for his stay at the inn
• why Bhagat used specific mathematical strategies to come up with his solution for his stay at the inn
• why persistence and dedication are critical to problem solving
• how math is critical in everyday life

Encourage students to consider why the author, Rajani LaRocca, would want to share this story with young people.
VOCABULARY

The story contains several content-specific and academic words and phrases that may be unfamiliar to students. Based on students’ prior knowledge, review some or all of the vocabulary below. Encourage a variety of strategies to support students’ vocabulary acquisition: look up and record word definitions from a dictionary, write the meaning of the word or phrase in their own words, draw a picture of the meaning of the word, create a specific action for each word, list synonyms and antonyms, and write a meaningful sentence that demonstrates the definition of the word.

Content Specific
- raja, kingdom, Amma, rupee, sari, goldsmith, estates

Academic
- vast, calculating, suffered, toil, meager, relented, glimmered, parched, quenched, abundance, prospered
AFTER READING

Discussion Questions
After students have read the book, use these or similar questions to generate discussion, enhance comprehension, and develop appreciation for the content. Encourage students to refer to passages and/or illustrations in the book to support their responses. To build skills in close reading of a text, students should cite textual evidence with their answers.

Literal Comprehension
(Reading Standards, Key Ideas & Details, Strands 1–3)
(Speaking & Listening Standards, Comprehension & Collaboration, Strands 1–3 and Presentation of Knowledge & Ideas, Strand 4)

1. What happens in the rajah’s kingdom? Why do his people suffer?
2. Where do Bhagat and his mother live at the beginning of the story? What is their life like?
3. What does Bhagat love to do?
4. What does Bhagat see that gave him hope for his future?
5. Why does Bhagat tell Amma that he had to go audition?
6. What does Amma give Bhagat before he left for his journey? What does she advise him to do?
7. What does Bhagat do on his journey to the audition?
8. What does the innkeeper tell Bhagat upon his arrival?
9. How does Bhagat convince the innkeeper to let him stay? What does the innkeeper suggest he do?
10. How does Bhagat think about the rings at the goldsmith? What does he decide to do?
11. How does Bhagat explain to the goldsmith what he wanted to do? What does the Seven Golden Rings become?
12. What does Bhagat give the innkeeper each night?
13. What happens on the last day?
14. Who speaks up after Bhagat stopped singing? What does she say?
15. How is Amma right in the end?
16. How do Amma and Bhagat live the rest of their days?

Extension/Higher Level Thinking
(Reading Standards, Key Ideas & Details, Strands 2 and 3 and Craft & Structure, Strands 4 and 6)
(Speaking & Listening Standards, Comprehension & Collaboration, Strands 1–3 and Presentation of Knowledge & Ideas, Strand 4)

1. What does the title Seven Golden Rings: A Tale of Music and Math mean to you after reading the book? Why do you think the author chose this particular title?
2. How does music help Bhagat throughout the book? Why is music such an important part of
his life? How did music help him to solve the problem of his stay at the inn? How does music make him feel? How did music inspire him in the story?

3. Why does Bhagat decide to audition for the rajah’s musical troupe? What did you think of his decision? Why was this a difficult but necessary choice for him to make?

4. How does the rajah’s poor budgeting and financial decisions affect the rest of the people? Can you think of another example of how poor financial planning can affect people? Why is it important to learn about finances and budgets?

5. How does Bhagat save the rajah and his kingdom in the end? Who is instrumental in the rajah recognizing Bhagat? Why was this an important acknowledgment?

6. How does Amma inspire Bhagat? What does she say that rings true in the end? How was Amma’s advice critical to Bhagat’s success? What kinds of advice have other people given you that were helpful? Why?

7. Explore the structure of this text. Does the story describe events chronologically, as comparison, cause and effect, or problems and solutions? Why do you think the author structured the text the way she did? How does this story compare to other texts you have read?

Reader’s Response

(Writing Standards, Text Types & Purposes, Strands 1–3 and Production & Distribution of Writing, Strands 4–6)

Use the following questions and writing activities to help students practice active reading and personalize their responses to the book. **Suggest that students respond in reader’s response journals, essays, or oral discussion.** You may also want to set aside time for students to share and discuss their written work.

1. What is one big thought you have after reading this book? Think about Bhagat’s dedication to using the rings to stay at the inn in order to audition for the musical troupe. What is your takeaway from this book? What would you tell a friend about this book?

2. What do you think is Rajani LaRocca’s message to the reader? Think about possible motivations behind Rajani LaRocca’s intentions for writing the book. What do you think she wanted to tell her readers?

3. Have students make a text-to-self connection. What kinds of connections did you make from this book to your own life? What do Bhagat’s experiences, thoughts, and feelings mean to you?

4. Have students make a text-to-text connection. Did you think of any other books while you read *Seven Golden Rings: A Tale of Music and Math*? Why did you make those connections?

5. Have students make a text-to-world connection. What kind of connections did you make between this book and what you have seen in the world, such as online, on television, or in a newspaper? Why did this book make you think of that?

6. What does using everyday math mean to students after reading? After reading *Seven Golden Rings: A Tale of Music and Math*, how did students’ perspectives change about how you use math to solve everyday problems, and not just the ones we see in school?
7. Why did you learn about binary numbers from the story? How can Bhagat’s problem solving help us with difficult situations in the future? What are other ways that you think you can use binary numbers?

ELL Teaching Activities
(Speaking & Listening Standards, Comprehension & Collaboration, Strands 1–3 and Presentation of Knowledge & Ideas, Strands 4–6)
(Language Standards, Vocabulary Acquisition & Use, Strands 4–6)
These strategies might be helpful to use with students who are English Language Learners.

1. Assign ELL students to partner-read the story with strong English readers/speakers. Students can alternate reading between pages, repeat passages after one another, or listen to the more fluent reader.

2. Have each student write three questions about the story. Then let students pair up and discuss the answers to the questions.

3. Depending on students’ level of English proficiency, after the first reading:
   - Review the illustrations in order and have students summarize what is happening on each page, first orally, then in writing.
   - Have students work in pairs to tell what they learned about one of the poems. Then ask students to write a short summary, synopsis, or opinion about what they have read.

4. Have students give a short talk about Bhagat, his passion for music, and how he used creative problem solving to come up with a solution for his stay at the inn.

5. The book contains several content-specific and academic words that may be unfamiliar to students, and several words are printed in bold. Based on students’ prior knowledge, review some or all of the vocabulary. Expose English Language Learners to multiple vocabulary strategies. Have students make predictions about word meanings, look up and record word definitions from a dictionary, write the meaning of the word or phrase in their own words, draw a picture of the meaning of the word, list synonyms and antonyms, create an action for each word, and write a meaningful sentence that demonstrates the definition of the word.

Social and Emotional Learning
(Reading Standards, Key Ideas & Details, Strands 1-3 and Craft & Structure, Strands 4-6)
(Speaking & Listening Standards, Comprehension & Collaboration, Strands 1–3 and Presentation of Knowledge & Ideas, Strand 4)
(Writing Standards, Text Types & Purposes, Strands 1–2 and Production & Distribution of Writing, Strands 4–6)
(Language Standards, Vocabulary Acquisition & Use, Strands 6)
Social and emotional learning involves being aware of and regulating emotions for healthy development. In addition to understanding one’s own feelings, strong socio-emotional development allows individuals to develop empathy for others and to establish and maintain relationships.

Use the following prompts to help students study the socio-emotional aspects of this book.

1. How does Bhagat demonstrate problem solving in Seven Golden Rings: A Tale of Music and Math? What were some of the obstacles that he comes across and how does he generate solutions?
2. How does Bhagat feel about music? Do you have a passion or hobby that makes you feel fulfilled? Why does it make you feel that way?

3. Have students chart Bhagat’s emotions over the course of the story. How does he feel when he sees the sign for the audition? What about when his mother gives him advice? How about when he arrives at the inn? Use the illustrations as a reference and way to tap into students’ visual literacy skills.

4. Bhagat demonstrates how to solve a problem through the seven rings. Is there a time when you solved a complicated problem? What did you do? How did you think about the solution? What was the end result? How did it make you feel afterwards?

5. Choose an emotion that interests you: happiness, sadness, fear, anxiety, frustration, hope, perseverance and so on. Illustrate or act out what that emotion looks like in Seven Golden Rings: A Tale of Music and Math.

INTERDISCIPLINARY ACTIVITIES

(Interdisciplinary Activities, page 7: Students who are college and career ready must be able to build strong content knowledge, value evidence, and use technology and digital media strategically and capably)

Use some of the following activities to help students integrate their reading experiences with other curriculum areas. These can also be used for extension activities, for advanced readers, and for building a home-school connection.

**English/Language Arts**

(Related Standards, Key Ideas and Details, Strands 1–3, Craft and Structure, Strands 4–6, Integration of Knowledge & Ideas, Strands 7–9, Range of Reading of Text Complexity, Strand 10)

(Writing Standards, Text Types & Purposes, Strands 1–3, Production & Distribution of Writing, Strands 4 and 6, Research to Build & Present Knowledge, Strands 7–9, Range of Writing, Strand 10)

(Speaking and Listening Standards, Comprehension and Collaboration, Strands 1–3, Presentation of Knowledge and Ideas, Strands 4–6)

- **Envision a sequel to Seven Golden Rings: A Tale of Music and Math and have students title the second book.** What do they think it would be called? What kinds of tasks did Bhagat do at the rajah’s palace? What were the different things that he needed to do as the “thinker?” How did he continue to use math as the “thinker?” What were some of the ways that he continued to help the rajah and his community? Students can accompany their written piece with an illustration or other visual representation of their choice.

- **Read Seven Golden Rings: A Tale of Music and Math and Twenty-Two Cents: Muhammad Yunus and the Village Bank**. Compare and contrast how Bhagat and Muhammad Yunus used creative problem solving and their math skills to create unique solutions for their predicaments. What were the ways that they used math that helped them to accomplish their goals? Have students think about other books that they’ve read where the main characters or historical figures use math. How do they compare to these titles? Students can write their findings in a comparative essay and then share their thoughts with partners, small groups, or the whole class.

- **Create a problem-solving chart.** As a class, identify some of the problems Bhagat faced in Seven Golden Rings: A Tale of Music and Math, and write them on a chart. These include
frustration, lack of access to resources, and more. Then, have students discuss productive ways of solving problems by evaluating how Bhagat navigated these problems in *Seven Golden Rings: A Tale of Music and Math*. Add the solutions to the chart, and have students reflect on this experience after and how they can use these ideas when they confront future issues.

- **Come up with questions to interview the author, Rajani LaRocca.** What was her process behind creating *Seven Golden Rings: A Tale of Music and Math*? What was her inspiration for writing her story about Bhagat? Read the Author’s Note with students and have them discuss what they learned and how it made them think about the book differently. Why did she write this book for young readers? Consider reaching out to Rajani LaRocca for a virtual author visit (https://www.rajanilarocca.com/).

**Social Studies/Geography**

(Reading Standards, Key Ideas and Details, Strands 1–3, Craft and Structure, Strands 4–6, Integration of Knowledge & Ideas, Strands 7–9, Range of Reading of Text Complexity, Strand 10)
(Reading Standards, Writing Standards, Text Types & Purposes, Strands 1–3, Production & Distribution of Writing, Strands 4 and 6, and Research to Build & Present Knowledge, Strands 7–9, Range of Writing, Strand 10)
(Speaking and Listening Standards, Comprehension and Collaboration, Strands 1–3, Presentation of Knowledge and Ideas, Strands 4–6)

- **Have students learn about the royal governments in India and how they worked.** What was the role of the rajah (king)? How did they come into power? What were their duties? Why was it so important that they took care of their people? Check out more information about India’s government through the National Portal of India (https://knowindia.gov.in/culture-and-heritage/medieval-history.php) and PBS’ “The Story of India” Unit for more information about teaching about the history of India in the classroom (https://www.pbs.org/thestoryofindia/teachers/lessons/).

**Math**

(Mathematics Standards, Grade 5, Number & Operations in Base Ten, Strands 5 and 7 and Operations & Algebraic Thinking, Strands 1 and 2)
(Reading Standards, Integration of Knowledge & Ideas, Strand 7)
(Speaking & Listening Standards, Comprehension & Collaboration, Strands 2 and 3)
(Writing Standards, Research to Build & Present Knowledge, Strand 9)

- **How does Bhagat use binary numbers to pay for his stay at the inn?** Using the backmatter from *Seven Golden Rings*, have students learn more about binary numbers. Code.org has a lesson dedicated to binary numbers for more information and additional classroom activities (https://curriculum.code.org/csp-18/unit1/5/). The article, “How to teach binary numbers to kids using a cool math trick” also addresses more ways to teach about binary numbers (https://medium.com/@e.rajasekar/how-to-teach-binary-numbers-using-cool-math-trick-c0ae7edad92).

- **Ask students to evaluate how they use math in their everyday life.** Edutopia’s article, “7 Real-World Math Strategies” has additional examples and ways to incorporate math from the classroom. Consider having students come up with their ideas and put them on a wall or chart paper for everyone to see how math is used so often (https://www.edutopia.org/article/7-real-world-math-strategies).

- **Experiment with different ways to divide a whole.** BrainPOP has different activities on how to make equal groups (https://educators.brainpop.com/lesson-plan/making-equal-
groups-activities-for-kids/?bp-jr-topic=making-equal-groups). What are the different things
in the classroom or home that you can take apart and make a whole from? Keep a running list
and continue to add to it when you discover something new. How can you divide other things
into wholes? Have students share their findings visually with a partner, small group, or whole
class.

- **Have students come up with fun math problems about everyday life events.**
  Students can think about how they use math in everyday life, and then generate a word
  problem to give to a partner or small group. Have students share all of their math problems
  with the whole class. Afterwards, students can reflect on what it was like to come up with a
  math problem. What did they learn from this experience?

- **If possible, invite a software developer or engineer to come into the classroom
  and discuss binary numbers and the basics of coding.** Questions for the guest to
discuss with the students might include: How do you use binary numbers in your job? What
is coding? How did you learn about coding? What kinds of ways do you use binary numbers
in other parts of your life? Have students reflect on what they learned with a partner or small
group.

- **Have students experiment with budgets.** The rajah did not have interest in planning
  and calculating the different needs of his kingdom’s accounts, and his people suffered the
consequences. Have students think about the different elements that go into a budget. Give
students examples of everyday budgets and different needs they think about (how much food
and groceries cost, what it takes to travel with a car or public transportation), and calculate
those costs. InCharge has basic lesson plans for elementary students on budgeting and
financial literacy (https://www.incharge.org/financial-literacy/resources-for-teachers/financial-
literacy-for-kids/).

**Arts, Media & Music**
(Reading Standards, Key Ideas and Details, Strands 1–3, Craft and Structure, Strands 4–6, Integration of Knowledge & Ideas, Strands 7–9, Range of Reading of Text Complexity, Strand 10)
(Writing Standards, Text Types & Purposes, Strands 1–3, Production & Distribution of Writing, Strands 4 and 6, Research to Build & Present Knowledge, Strands 7–9, and Range of Writing, Strand 10)
(Speaking and Listening Standards, Comprehension and Collaboration, Strands 1–3, Presentation of Knowledge and Ideas, Strands 4–6)

- **Use music to teach about math in the classroom.** PBS has a lesson plan called,
  “Math in Music” (https://www.thirteen.org/get-the-math/teachers/teachers-math-in-music-
overview/73/). Have students think about how music and math are interconnected. Students
can brainstorm different ways that math is utilized in music and provide concrete examples.
Encourage students to look at how patterns and rhythms are inherently mathematical. See
Sadlier’s Math Blog for more ideas and information on how to use music and math together
(https://www.sadlier.com/school/sadlier-math-blog/music-and-math-lesson-plan-grades-1-6-
teaching-math-through-music).

- **Put on a play or conduct a Reader’s Theatre lesson where students read or act out
parts from the story.** Assign students the different roles of the characters from the story
(Bhagat, Amma, the innkeeper, the goldsmith, the rajah, and the innkeeper’s wife). Have
students use the text as inspiration for their role. What kind of emotions or inflections should they use when acting out or reading their lines from the story?

**School-Home Connection**

(Reading Standards, Integration of Knowledge and Ideas, Strands 7 and 9)

(Writing Standards, Text Types & Purposes, Strands 1-3, Production & Distribution of Writing, Strand 4, and Research to Build & Present Knowledge, Strands 7-9, Range of Writing, Strand 10)

(Speaking and Listening Standards, Comprehension and Collaboration, Strands 1-3, Presentation of Knowledge and Ideas, Strands 4-6)

- **Encourage students and their families to think about how they use math in their daily routines.** Students can interview their family members about how they use math in their lives. How do they use math at work? How do they use math at home? Why is math important for their daily activities? Students can share their findings with a small group or the whole class.

- **If possible, provide a copy of Seven Golden Rings: A Tale of Music and Math for students to bring home to read with their families.** Families and students can discuss what they learned from Seven Golden Rings: A Tale of Music and Math and what they learned about binary numbers.

- **Ask students to interview family members about what music means to them.** Music is essential in Bhagat’s life and helps him solve the issue about his stay at the inn. How has music been helpful in students’ and families’ lives? What music do they like to listen to? How does it make them feel?
ABOUT THE AUTHOR

Rajani LaRocca was born in Bangalore, India and immigrated to the US with her parents when she was a baby. She graduated from Harvard with both a BA and an MD, and has worked as a primary care physician since 2001. Her debut middle-grade novel, *Midsummer Mayhem*, was praised as “a delectable treat” in a *Kirkus* starred review. Rajani lives in Concord, Massachusetts, with her family. Find her online at rajanilarocca.com and on Twitter as @rajanilarocca.

ABOUT THE ILLUSTRATOR

Archana Sreenivasan is the illustrator of two board books in the Once Upon a World series, *Rapunzel* and *Diwali*, and she has also created numerous editorial pieces, book covers, and comics. She studied animation film design at the National Institute of Design in Ahmedabad, India, and illustration during a summer residency at the School of Visual Arts in New York. Archana lives in Bangalore, India, with her husband and two cats. Please visit her on the web at archanasreenivasan.com and on Instagram as @archanasreenivasan.

REVIEWS

“This succeeds both as an entertaining read-aloud and as a teasing introduction to the binary system.” – *Booklist*, starred review

“A deft and engaging introduction to a sometimes flummoxing subject.” – *Publishers Weekly*, starred review

“Discover: A young Indian boy applies math and critical thinking skills in his endeavor to win a place in the rajah’s court.” – *Shelf Awareness*

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