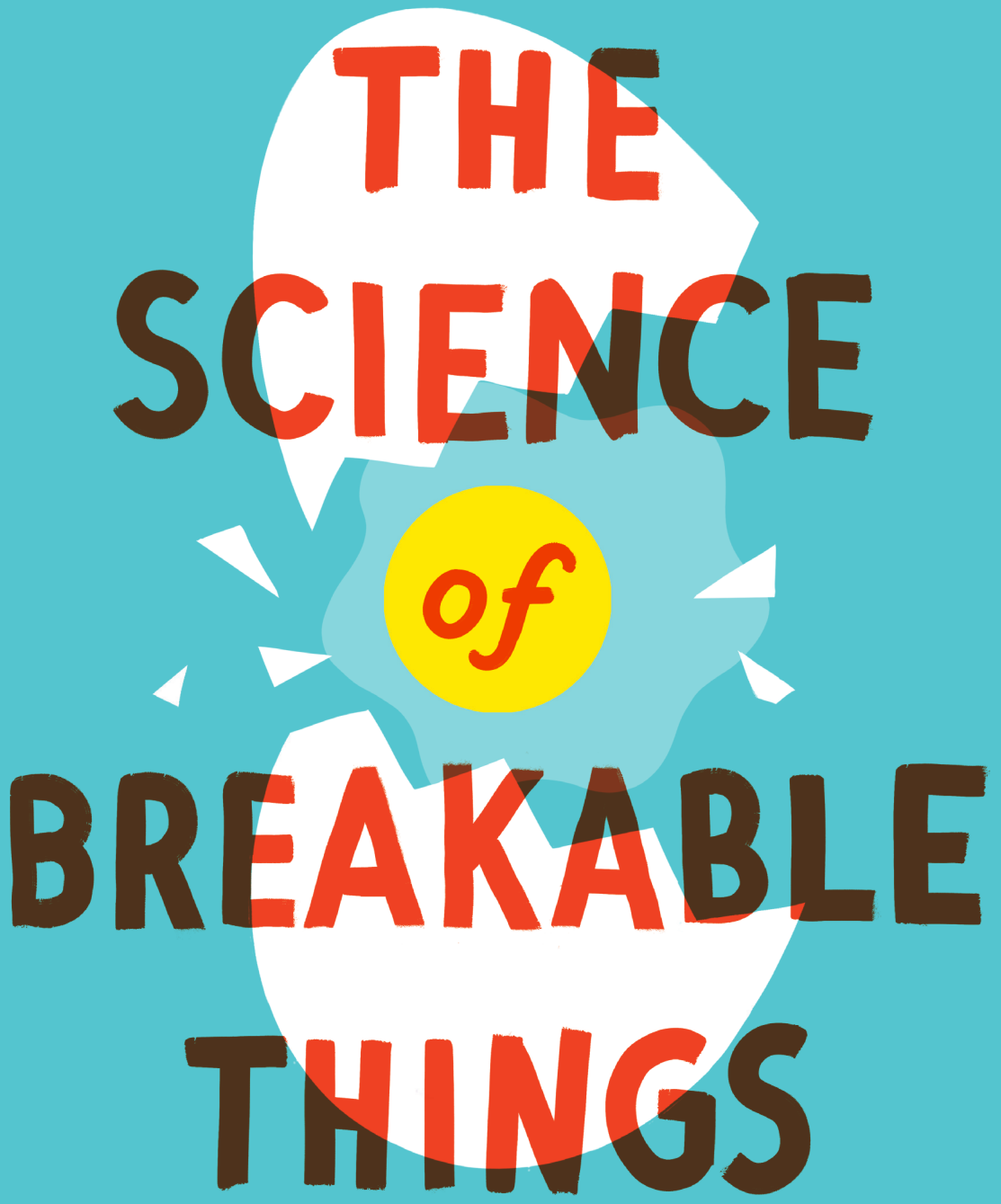
Tae Keller

Newbery Award–winning author of *When You Trap a Tiger*



Eggs are breakable.
Hope is not.

EDUCATORS' GUIDE

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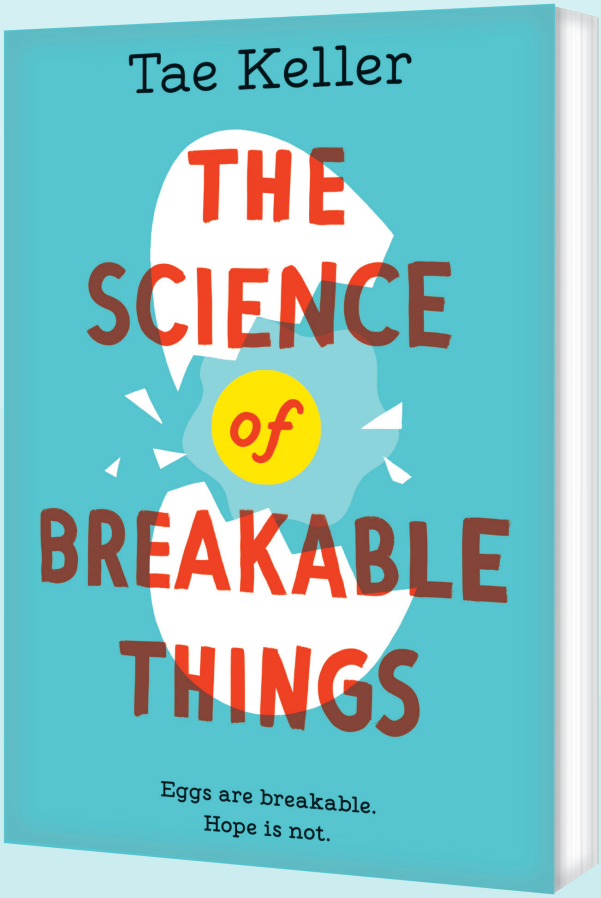
About the Book

Natalie's uplifting story of using the scientific process to "save" her mother from depression is what *Booklist* calls "a winning story full of heart and action."

Eggs are breakable. Hope is not.

When Natalie's science teacher suggests that she enter an egg drop competition, Natalie thinks that this might be the perfect solution to all of her problems. There's prize money, and if she and her friends win, then she can fly her botanist mother to see the miraculous Cobalt Blue Orchids—flowers that survive against impossible odds. Natalie's mother has been suffering from depression, and Natalie is sure that the flowers' magic will inspire her mom to love life again. Which means it's time for Natalie's friends to step up and show her that talking about a problem is like taking a plant out of a dark cupboard and giving it light. With their help, Natalie begins an uplifting journey to discover the science of hope, love, and miracles.

A vibrant, loving debut about the coming-of-age moment when kids realize that parents are people, too. Think *The Fourteenth Goldfish* meets *The Thing About Jellyfish*.

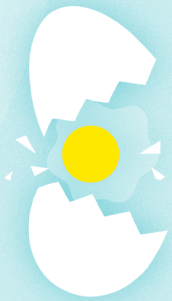


Themes: Family & Relationships, Friendship, Science & Nature, Growing Up, Emotions & Feelings

Jenny Jimenez

About the Author

Tae Keller is the Newbery Medal–winning and *New York Times* bestselling author of *When You Trap a Tiger* and *The Science of Breakable Things*. She was born and raised in Honolulu, where she grew up on purple rice, Spam musubi, and her halmoni's stories. After high school, she moved in search of snow, and now lives in Seattle. Visit her online at TaeKeller.com or find her on Instagram at @Tae_Keller.



Pre-Reading Activity

Divide the class into small groups and ask them to conduct an egg drop experiment. Provide various materials for them to consider for their experiment: cereal, bubble wrap, packing peanuts, and other types of packing materials. Have the groups record information about each step of their experiment.

The Scientific Process

Step 1

Ask a Question

Start with something you are curious about. This is the problem you want to solve.

Step 2

Do Background Research

Learn more about your question by reading books, articles, or talking to experts.

Step 3

Construct a Hypothesis

Make an educated guess about what you think the answer to your question might be.

Step 4

Test Your Hypothesis by Doing an Experiment

Design a test to see if your hypothesis is correct. Make sure to keep everything the same except for one thing you are testing.

Step 5

Analyze Your Data and Draw a Conclusion

Look at the results of your experiment. Did your test support your hypothesis or not?

Step 6

Communicate Your Results

Share what you found out with your classmates. This can be through a report, a presentation, or even a science fair.

Step 7

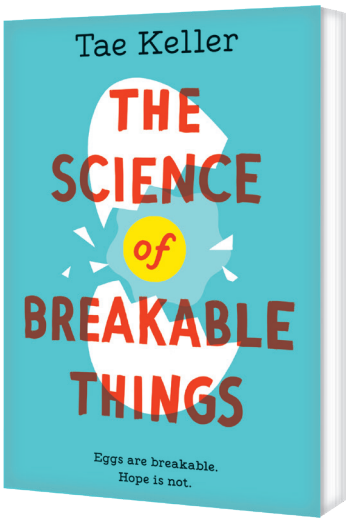
Repeat

Sometimes, you need to do the experiment again to make sure your results are accurate.

Step 8

Reflect and Ask New Questions

Think about what you learned and come up with new questions to explore.



Discussion Questions

1. Discuss the structure of the novel. How do the eight steps slowly reveal information about the characters, conflict, and plot? What do the footnotes contribute to the story?
2. In Step 1, Mr. Neely asks students to observe. What do readers observe about Natalie from the entries in her lab notebook? (pp. 5–6) Discuss Natalie's feelings about Mr. Neely, Mikayla Menzer, and Twig. How does she hint about the conflict of the novel?
3. Mr. Neely says that Step 2 in the scientific process is to question. He wants his students to investigate something that intrigues them. What questions does Natalie have about family and friendship?
4. Define friendship from Natalie's point of view. She and Mikayla were good friends when they were younger. What went wrong? How do friendships sometimes change in middle school? Natalie says that friends know which topics to avoid. Which subjects do Natalie and Twig avoid?
5. Natalie's new best friend is Twig. Compare and contrast their families. How do they both feel abandoned? Describe the girls' relationships with Dari. How do they need him as much as he needs them? Explain why Twig and Dari make Natalie the leader of their team for the egg drop competition.
6. Natalie's father uses a euphemism to refer to her mother's condition, possibly to soften the impact of discussing her depression. How does Natalie perceive her mother's mental health? How might a more open conversation with her father about her mother's condition benefit Natalie?
7. Natalie's mom is a botanist. How does Natalie relate her mom's condition to that of plants? Natalie writes in her lab journal, "I want to say to her: Come back." (p. 26) Where does Natalie think that her mother has gone? Her mom wrote a book titled *How to Grow a Miracle.* Why is Natalie eager to read her mother's writing?
8. What is the significance of the Cobalt Blue Orchid? How does pursuing the orchid give Natalie hope? Discuss Natalie's reaction when she learns that the blue plant in their greenhouse was not a Cobalt Blue Orchid but a Bearded Blue Iris. She later asks her mom why she planted the iris. Explain what her mother means by "we deserve a second chance." (p. 279)
9. Discuss why the Korean fire plant is an ideal Christmas gift for Natalie's mom. What might be its symbolic meaning within the story?
10. Why does Natalie throw eggs at the plants in the greenhouse? Explain why Natalie's father calls Twig to come over.
11. Natalie says, "For a moment I felt like a scientist, gathering little bits of research about myself and trying to analyze it." (p. 196) Identify the characters that directly or indirectly help her with the research. At what point in the novel does Natalie really begin to analyze her family situation? What conclusion does she draw?
12. Betrayal is a topic that is mentioned throughout the book. Why does Natalie think that Mrs. Menzer betrayed her mother? Cite other examples of betrayal in the novel.
13. Natalie and Dari come from different ethnic backgrounds. How might their personal experiences and cultural heritage shape their views on their identities?
14. What does Natalie learn about life from Operation Egg? Explain the following quote: "Because science is asking questions. And living is not being afraid of the answer." (p. 292)
15. Explain the title of the book. What is the breakable thing?

Activities and Prompts

- "Assignment 4: Plants Are People, Too" reveals that Natalie's mom is a botanist who believes that plants are a language. Use resources from the library or the Internet to research the meanings of various plants. The following site may be helpful. Then, choose a plant that one character in the novel might give to another and write a paragraph explaining your choice. **STEM!**
- Idioms are commonly used phrases in which meaning is garnered not from individual words but from the expression as a whole. Often, that meaning is far removed from any literal definition. What does Natalie's father mean when he tells her that the family needs to "tighten our belt a notch." (p. 6) Discuss the meaning of the following common idioms:
  - "A penny for your thoughts"
  - "Add insult to injury"
  - "Back to the drawing board"
  - "Ball is in your court"
  - "Barking up the wrong tree"
  - "Every cloud has a silver lining"
  - "In the heat of the moment"
  - "Make a long story short"
- Ask students to select an idiom and write a paper discussing where in the book the phrase could be used. Identify which character is most likely to use it and describe the situation in which it would be appropriate.
- Natalie's father is a therapist. Research the skills required to be an effective therapist. Using examples from the book, write a paper discussing whether you believe Natalie's father demonstrates these skills effectively.
- Scientists who began their work as teenagers include Isaac Newton, Albert Einstein, Galileo Galilei, Aristotle, Marie Curie, Ada Lovelace, Rosalind Franklin, Lise Meitner, and Dorothy Hodgkin. Ask students to research one of these scientists and write a biographical entry for a fictional book titled *Teenage Scientists.* Include a discussion of the scientific investigations that made them famous. **STEM!**
- Marie Curie and her husband won the Nobel Prize in Physics in 1903, and she won the Nobel Prize in Chemistry in 1911. Ask students to research the number of women and men who have won the Nobel Prize in various scientific fields using nobelprize.org. Then, have them create a bar graph comparing the figures by year. What is the ratio of female to male prizewinners? Discuss the findings and whether the results are surprising to the students.

Vocabulary/ Use of Language

Students should be encouraged to jot down unfamiliar words and try to define them, taking clues from context. Such words may include: *optimistic* (p. 4), *pretense* (p. 17), *amicably* (p. 20), *conflicted* (p. 41), *velocity* (p. 74), *illusion* (p. 95), *indecipherable* (p. 95), *intimidating* (p. 99), *siphon* (p. 113), *initiative* (p. 123), *oblivious* (p. 146), *averted* (p. 157), *morphed* (p. 225), *anomaly* (p. 260), and *confiscated* (p. 273).

Prepared by Pat Scales, Children's Literature Consultant, Greenville, South Carolina

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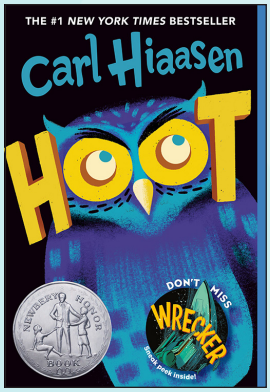

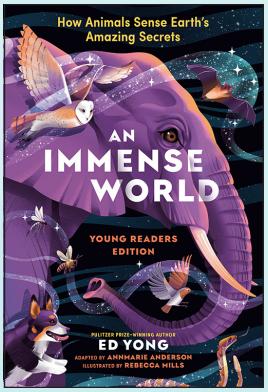

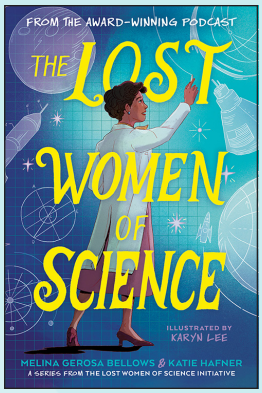

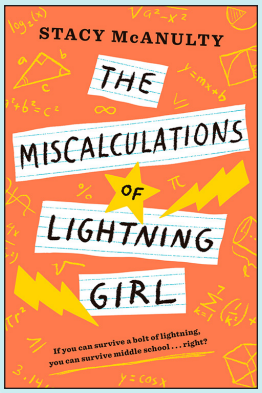

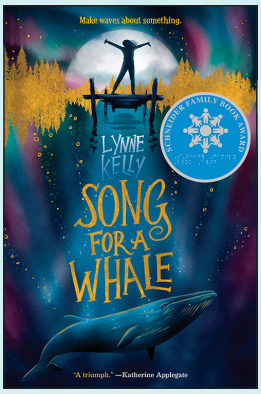

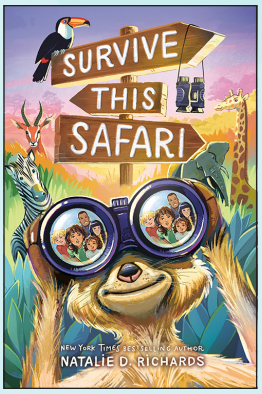

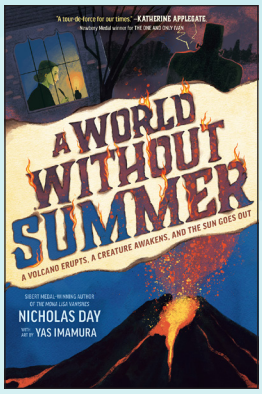

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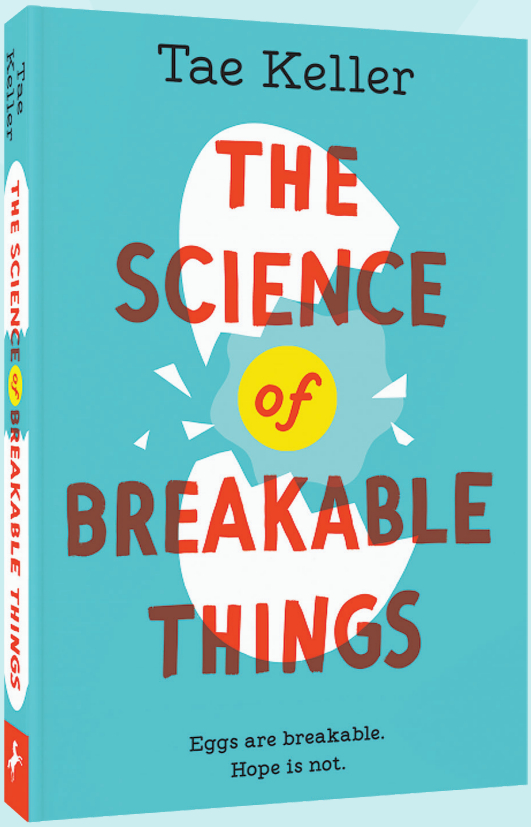
Praise for

The Science of Breakable Things

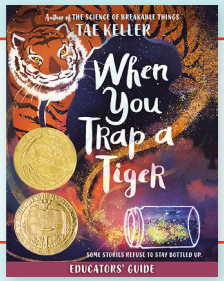


★ **"A compassionate glimpse of mental illness."**
—*Kirkus Reviews,* starred review

★ **"A winning story full of heart and action."**
—*Booklist,* starred review

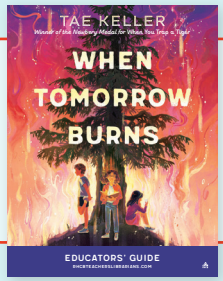
"An emotional story that explores parental depression with realism and empathy."
—*School Library Journal*

"Friendships are the heart of the book, but science is its soul."
—*Publishers Weekly*



Click here for the *When You Trap a Tiger* Educators' Guide

Click here for the *Jennifer Chan Is Not Alone* Educators' Guide



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