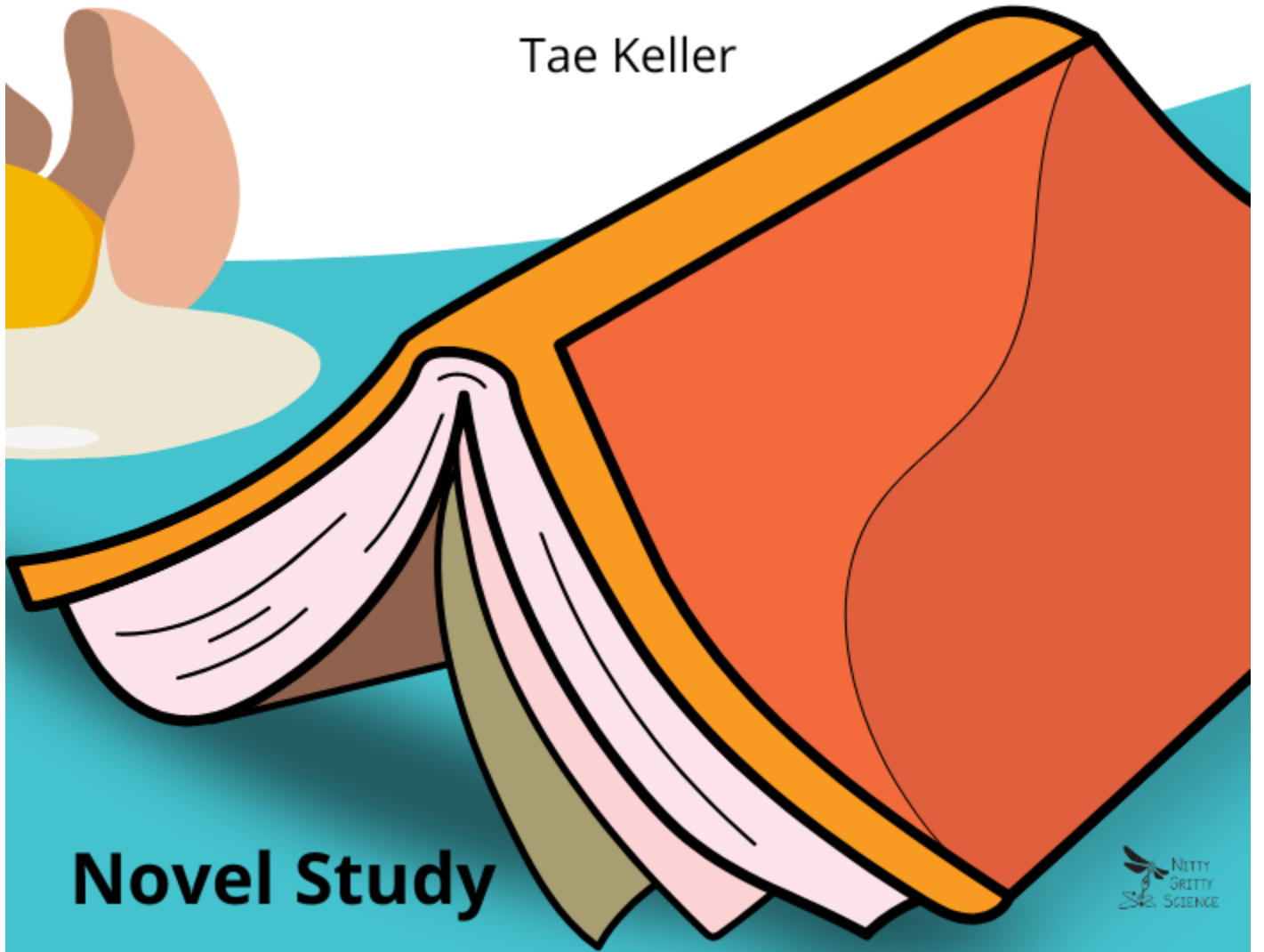




THE SCIENCE OF BREAKABLE THINGS

Tae Keller



Novel Study

NITTY
GRITTY
SCIENCE

Why Novel Studies in the Science Classroom?

Here at Nitty Gritty Science we want to foster the love of reading and improve science literacy. We believe that using novel studies in the science classroom will not only give students exposure to different perspectives but will also help them develop an understanding of how science vocabulary applies to so many events in their lives.

Research also shares benefits of using novel studies in the science classroom such as:

The literacy from reading can easily come from non-fiction and fiction novels that surround a science-related topic and are far more of a high-interest read for the majority of students than reading a textbook (Anderson & Hite, 2010; Batchelor, 2017; Coiro, 2012; Freudenrich, 2000).

Science fiction novels are an excellent way to engage students in science ideas while also helping students improve their literacy skills. (Creech and Hale, 2006)

Teachers can add in other readings from the internet and news articles which brings the reading level down to a more manageable level, however students are more willing to learn and spend the time to learn new vocabulary when highly engaged in what they are reading (Weinbugh et al., 2014).

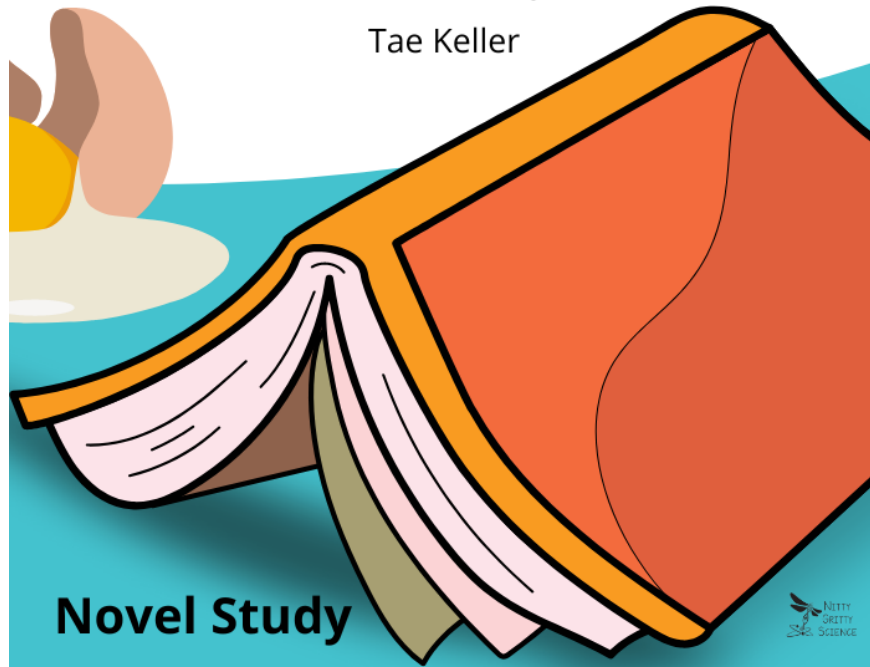
There is very little research out there about the usefulness of using novels in classrooms other than ELA. Others have used novels and other types of formats to get students excited about science and science concepts (Batchelor, 2017; Coiro, 2012; Freudenrich, 2000; Ivey & Fisher, 2005; Jarman & McClune, 2001), but very few have used novels to teach science concepts and also try to increase literacy skills among students in the secondary classroom, so Nitty Gritty Science is here to help with that!

Happy reading,
Erica



THE SCIENCE OF BREAKABLE THINGS

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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.

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Check out the following sample pages focusing on science vocabulary, reading comprehension, and literacy-based projects!

Teacher Guide included!

Find out what students already know.

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BEFORE YOU READ

Directions: The Scientific Method is an organized set of investigative procedures scientists use to answer questions about the natural world around them. Fill in the blanks.

Step 1: Observe	Step 2: Question
Step 5: Procedure	Step 6: Evaluate

THE SCIENCE OF BREAKABLE THINGS

Initials: _____

WORD STUDY: Pages 3-27

1. Science

List as many topics related to science as you can.

2. Footnote

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Initials: _____

WORD STUDY: Pages 3-27

6. Chemical reaction

What happens when a chemical reaction occurs?

7. Inflate

Identify two synonyms for the word *inflate*.

9. Dissection

Definition:

THE SCIENCE OF BREAKABLE THINGS

Initials: _____

WORD STUDY: Pages 28-72

1. Homeostasis

Homeostasis refers to living organisms maintaining a stable internal environment.

True False

3. Naïve

Identify two synonyms for the word naïve.

5. Magnifying glass

Draw a picture of magnifying glass.

7. Astronaut

Describe the job of an astronaut.

9. Boiling

What is the boiling point of water?

_____ Fahrenheit

_____ Celsius

11. Classification system

Arrange the eight levels of taxa from the most general to the most specific.

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Initials: _____

WORD STUDY: Pages 28-72

12. Cobalt / Aluminum

Cobalt and Aluminum are elements found on the periodic table. For each element write down its atomic number, atomic mass, and element abbreviation.

<input type="text"/>	<input type="text"/>
Cobalt	Aluminum

13. Pigments

Your skin get its color from a pigment that is called _____.

14. Ion

Definition:

15. Hybrid

Choose two animals and create a hybrid. Draw your new animal below.

16. Moss

Moss is an example of a _____ plant.

vascular nonvascular

Vocabulary

Novel Project option

THE SCIENCE OF BREAKABLE THINGS

Initials: _____

WORD STUDY: Pages 73-125

12. Perennial

Fill in the table to compare

Perennial	

13. Effect / affect

Explain the difference between effect and affect.

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Initials: _____

WORD STUDY: Pages 73-125

17. Repelled

Identify two synonyms for the word *repel*.

18.

THE SCIENCE OF BREAKABLE THINGS

Initials: _____

All About Magnets

Directions: Use the word bank to find words that relate to magnetism in the wordsearch below.

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

THE SCIENCE OF BREAKABLE THINGS

Initials: _____

WORD STUDY: Pages 245-292

12. Graft

What does it mean to graft when talking about plants?

13. Confiscate

Identify two synonyms for the word *confiscate*.

THE SCIENCE OF BREAKABLE THINGS

Initials: _____

WORD STUDY: Pages 245-292

17. Control

What is the control in an experiment?

19. Results

What are two ways you can communicate your results?

1. _____
2. _____

21. "As it turns out, you can't always predict and eggs will break, and everything will break, and everything will break anyway. Because science is asking a question and you're asking afraid of the answer."

What do you think this means?

18. Tropism

THE SCIENCE OF BREAKABLE THINGS

Name _____

Egg Drop Project

Directions: Using the engineering design process, you are going to compete in your very own egg drop challenge. Your mission is to protect an egg from breaking when dropped from a tall height to be determined by your teacher. You will design your contraption and then provide a brief explanation as to why you think it will work.

Materials with maximum allowance:

- Cotton balls (10)
- Straws (3)
- Balloon (1)
- Tape, glue, or rubber bands (5)
- Sandwich baggie (1)
- Sheets of paper (2)
- String (30 cm)
- other materials approved by teacher

Procedure:

1. Design and draw your egg drop contraption.
2. Use allowed materials to construct your egg protection contraption.
3. Carefully place egg inside.
4. Drop the egg from height determined by your teacher. Create a data table to record height of drop and observations. If egg is intact after each trial, increase height and drop again. Record results.

Analysis:

1. What happened when you dropped the egg? Did it crack or remain intact?

2. What could you do differently next time?

3. What material worked well? What material did not work well?



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Contact Information:

Email: erica@nittygrittyscience.com

Website: www.nittygrittyscience.com

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