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**Study Guide**

for

**A Wrinkle  
in Time**

by Madeleine L'Engle



New York, New York   Columbus, Ohio   Woodland Hills, California   Peoria, Illinois

# Meet Madeleine L'Engle



*I had to write . . . It didn't matter how small or inadequate [was] my talent. If I never had another book published, and it was very clear to me that this was a real possibility, I still had to go on writing.*

—Madeleine L'Engle

**M**adeleine L'Engle (pronounced leng el') wrote her first stories when she was only five years old. An only child, she often felt lonely, and to amuse herself she made up stories in which she was the heroine. Her loneliness grew when she and her parents moved to Switzerland and they enrolled her in a boarding school. She says of those unhappy years:

*I learned to shut out the sound of the school and listen to the story or the poem I was writing.*

Back in the United States, L'Engle attended Smith College in Massachusetts, where she acted in the theater and wrote plays. After graduation, she worked as a stage manager and an actress. She met her husband, Hugh Franklin, while she was the assistant stage manager for a Broadway production of a famous play called *The Cherry Orchard*. While working in the theater, L'Engle continued to write.

Her first few books sold well. *And Both Were Young*, for example, won its way onto *The New York Times* Ten Best Books of the Year list for 1949. During the 1950s, however, she postponed her writing career to raise her children. L'Engle and her husband ran a general store in Connecticut and raised a family. She wrote stories when she had time. *A Wrinkle in Time* was one of those stories. Twenty-six publishers rejected it before editors who had liked one of her earlier stories decided to publish it. The editors said they were publishing the book because they loved it. As it turned out, the public loved it too.

In 1963 *A Wrinkle in Time* won the Newbery Medal. Other awards followed, and the book became a classic of literature for young adult readers. "It was simply a book I had to write," L'Engle said of *A Wrinkle in Time*. "And it was only after it was written that I realized what some of it meant." The writing career that had come so close to ending was relaunched.

L'Engle has written more than forty books for children and young people. In 1998 she received the Margaret A. Edwards Award from the magazine *School Library Journal* for her lifetime contribution to writing for teens. She continued the story started in *A Wrinkle in Time* with another book, *A Wind in the Door*, in her Time Fantasy Series. She also has many loyal readers, who delight in her imaginative approach to stories. She says:

*I start with what I know with all five senses, what I have experienced, and then the imagination takes over and says, "But what if—" and the story is on.*

# Introducing the Novel

[*A Wrinkle in Time*] combines devices of fairy tales, overtones of fantasy, the philosophy of great lives, the visions of science, and the warmth of a good family story. It is an exuberant book, original, vital, exciting. Funny ideas, fearful images, amazing characters, and beautiful concepts sweep through it. And it is full of truth.

—Ruth Hill, *A Critical History of Children's Literature*

*A Wrinkle in Time* is no ordinary adventure story. While the pages of the novel are filled with all the action-packed scenes and suspense an adventure fan could want, the novel also explores common human struggles, such as the difficulties involved in growing up and trying to find one's identity. It is, perhaps, this mixture of the extraordinary and the everyday that has made the novel a favorite among young people and adults since 1962. It is a novel that not only entertains but also encourages readers to think and ask questions about the world. One critic writes: "It makes unusual demands on the imagination and . . . gives great rewards."

When *A Wrinkle in Time* begins, main characters Meg Murry and her younger brother Charles Wallace live with their mother and their brothers, Sandy and Dennys. Meg has trouble fitting in at school and misses the support of her father, a physicist, who has not been heard from for more than a year after he disappeared while performing a time-travel experiment.

A strange being from another world visits the Murry home one night and drops an important clue about Mr. Murry's whereabouts. Meg, Charles Wallace, and their friend Calvin O'Keefe then begin a dangerous journey through time and space to save Mr. Murry. They are assisted by the Murrays' somewhat unusual neighbors, Mrs. Whatsit, Mrs. Who, and Mrs. Which. The children soon find themselves at the center of a struggle between good and evil that threatens to destroy free-

dom and individuality. Along the way, they develop strength, courage, and abilities that they never knew they had. For Meg, in particular, the journey is more than an adventure or a mission to help others; it is also a journey of self-discovery that changes her ideas about herself and the people around her.

L'Engle's story contains elements of two categories, or genres, of fiction—fantasy and science fiction. **Fantasy** is imaginative writing that is set in strange or imaginary places and contains unusual characters who have magical powers. L'Engle's unearthly characters are colorful, unique, and sometimes frightening. **Science fiction** blends imaginative writing and science. The scientific language L'Engle uses in describing parts of the children's journey makes the story sound realistic, despite its fantastic elements. It also allows readers to recognize one of her important themes—the responsible use of science and technology.

Another important theme in the novel is the importance of love in a healthy society. To emphasize this idea, L'Engle draws on her strong personal religious beliefs and her belief in family. She expands this theme to include the self-love that allows individuals like her characters to believe in themselves.

## THE TIME AND PLACE

Although *A Wrinkle in Time* is timeless in its appeal to readers, its themes reflect the times during which it was written. For example, the idea of space exploration was new and exciting to people in the United States when the book was written in the early 1960s. The first artificial satellite was sent into space in the late 1950s by the Soviet Union. After the United States later launched its first satellite into orbit, the two nations began competing in the exploration of outer space. In 1961, a year before *A Wrinkle in Time* was published, both nations sent manned rockets into space for the first time. In her novel, L'Engle makes the idea of travel through space sound exciting but also

dangerous. She warns people against believing they know everything there is to know about the universe.

The novel also reflects political themes of the time. For example, life on the planet Camazotz is similar to what Americans thought life in the former Soviet Union was like at the time. In the 1960s, the United States and the Soviet Union were in the midst of a Cold War—a long period of hostility without actual war. The two nations

had very different political systems. Then, as now, the United States was a democratic country in which the individual rights of every citizen were protected by the Constitution. In the Soviet Union, however, many aspects of life were controlled by a central government. Soviet citizens did not have freedom of speech or freedom of religion. This novel presents L'Engle's views on a society without freedom and individuality.

### Did You Know?

Can people really travel through time? Does life exist beyond Earth and its atmosphere? In his theory of relativity, physicist Albert Einstein suggested that time travel could exist *in theory*. This does not mean that other, unknown factors could not prevent it from actually happening. According to physicist Stephen Hawking, we can believe that time travel is impossible because “we have not been invaded by hordes of tourists from the future.”

Many scientists strongly believe that other forms of life must exist in the universe. They point out that the star we know as our sun is like 400 billion other stars in our galaxy.

Because life exists on Earth, life probably can exist on a planet that rotates around a similar star. Scientists also point out that there are hundreds of billions of galaxies in the universe aside from our own, the Milky Way.

Because of the great distances between Earth and other stars, people probably will not be able to use a spacecraft to search for life outside the solar system any time soon. It is believed that any contact will have to be by radio. Successful radio contact, however, would require that other life forms be as technologically advanced as humans and have similar radio equipment.

# Before You Read

## *A Wrinkle in Time* Chapters 1–4

### FOCUS ACTIVITY

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What skills, strengths, ideas, or beliefs help you meet everyday challenges?

#### List Ideas

Make a list of the things you rely on when faced with a challenge. Include personal skills.

#### Setting a Purpose

As you read, identify the challenges that Meg Murry faces in her life.

### BACKGROUND

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#### Did You Know?

French author Jules Verne (1828–1905) is generally considered to be the first serious writer of science fiction. He wrote at a time when the public was becoming fascinated with the potential of science to change people’s lives. In his writing, Verne imagined devices and human abilities that did not become realities until after his death. His characters rode in airplanes and submarines before anyone had seen one. His books include *From the Earth to the Moon*, *Twenty Thousand Leagues Under the Sea*, and *A Journey to the Center of the Earth*.

#### Competing in Science

Madeleine L’Engle wrote *A Wrinkle in Time* in the early 1960s, when science was a popular topic around the world. The United States was trying to be the first country in the world to send people into space. Anything that contributed to this goal received the utmost attention.

Throughout the 1950s, the former Soviet Union and the United States competed with each other extensively in many areas, including in science. The Soviet Union was the first nation to put a satellite in orbit and excelled in other areas of science. To improve its space program, the U.S. government established the National Aeronautics and Space Administration (NASA). In the early 1960s, U.S. President John F. Kennedy promised to put an American on the moon “before the decade [was] out.” NASA trained crews of astronauts and improved space exploration equipment to prepare for the attempt. It was during this period of early space exploration that L’Engle wrote *A Wrinkle in Time*.

### VOCABULARY PREVIEW

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**antagonistic** [an tag’ə nis’tik] *adj.* hostile; unfriendly

**assimilate** [ə sim’ə lāt’] *v.* to absorb; to understand

**diction** [dik’shən] *n.* manner of speaking; pronunciation

**ephemeral** [i fem’ər əl] *adj.* short-lived; temporary

**preliminaries** [pri lim’ə ner’ēz] *n.* preparations; beginnings

**prodigious** [prə dij’əs] *adj.* tremendous; amazing

**relinquish** [ri ling’kwish] *v.* to let go; to abandon

**tangible** [tan’jə bəl] *adj.* touchable; real; solid

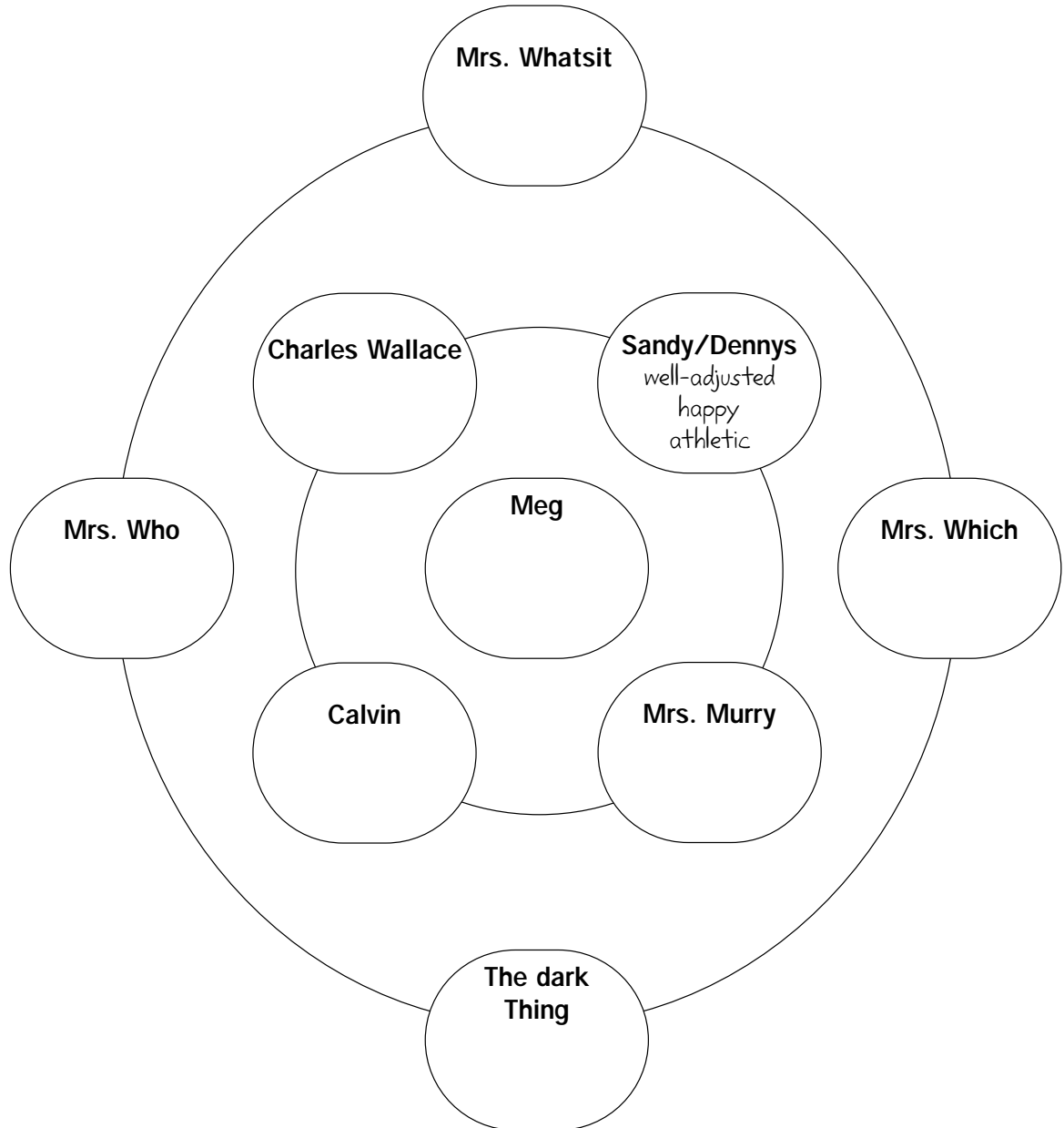
**tractable** [trak’tə bəl] *adj.* manageable; obedient

**wraithlike** [rāth’līk] *adj.* ghostly

# Active Reading

## *A Wrinkle in Time* Chapters 1-4

You will meet both extraterrestrial and human characters in *A Wrinkle in Time*. As you read, try to think of words that describe the characters. Add several adjectives until you have a brief description of the characters in the book.



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# Responding

## *A Wrinkle in Time* Chapters 1–4

### Personal Response

What thoughts do you have about Meg's personality as you read these chapters?

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### Analyzing Literature

#### Recall and Interpret

1. Why is Meg Murry unhappy at school?

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2. How and why does Calvin fit in with the Murry family?

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3. Where and why do Calvin, Charles Wallace, and Meg go with Mrs. Whatsit, Mrs. Who, and Mrs. Which?

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# Responding

## *A Wrinkle in Time* Chapters 1–4

### Analyzing Literature (*continued*)

#### Evaluate and Connect

4. In your opinion, why do the three children accept the three Mrs. Ws rather than fear them?

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5. In what ways does Meg seem like any other young person? In what ways are her feelings similar to yours?

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### Literature and Writing

#### Character Sketch

In the **Focus Activity** on page 12, you considered the ways in which you respond to challenges. How does Meg respond? Write a character sketch that describes Meg as you know her at this point in the story. What is she like? What problems is she facing? Be sure to include details from the book to support your ideas.

#### Extending Your Response

##### Literature Groups

Does the story seem believable or possible to you? In your group, discuss which elements from the story seem real, which seem possible, and which seem impossible. Then discuss whether the impossible elements affect your enjoyment of the novel. Have each person explain his or her position.

##### Learning for Life

Imagine that you are a guidance counselor at Meg's school. You believe Meg can do better classwork. Write a letter to Mrs. Murry about Meg, explaining the problem as you see it and suggesting possible solutions.

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*Save your work for your portfolio.*



# Before You Read

## *A Wrinkle in Time* Chapters 5–8

### FOCUS ACTIVITY

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Many stories examine the conflict between good and evil. What examples of goodness do you see in the world around you?

#### Think-Pair-Share

Make a list of good works, such as food and clothing drives, in which people in your community are involved. Then share your list with a partner and discuss other ways that people can promote goodness in your community and in the world.

#### Setting a Purpose

In this section, Meg, Charles Wallace, and Calvin learn about an evil power that threatens the universe. Read to discover how the children try to deal with it.

### BACKGROUND

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#### Did You Know?

Before the children begin their travels, Mrs. Whatsit, Mrs. Who, and Mrs. Which warn them of an ongoing cosmic struggle between good and evil. To illustrate this struggle, they use many **allusions**. An allusion is a reference in a work of literature to another work of literature or to a well-known person, place, or event in history. Writers often use allusions to express complex ideas. Sometimes the allusions are direct, such as quotations from historical figures. Sometime, however, allusions are less obvious. For example, the Murry's dog Fortinbras is named after a character in Shakespeare's play *Hamlet* who is strong and brave in military matters. In a subtle way, the allusion tells you something about the dog and something about the people who named him. You might guess that the Murrays enjoy literature and value strength and courage. Watch for allusions in chapters 5–8 and throughout the novel.

#### Tesseract

When Meg, Calvin, and Charles Wallace ask how they can go on a mission through time and space, Mrs. Whatsit says, "Now we will tesser." The children will learn that tessering is a shortcut through time and space that will allow them to travel quickly to other planets. Although the journey the children will take is fantasy, some of L'Engle's story is based on real science. For example, a dimension is anything that can be measured in space. The three ordinary dimensions on Earth are length, width, and depth. Albert Einstein considered time a fourth dimension.

### VOCABULARY PREVIEW

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**aberration** [ab'ə rā'shən] *n.* change from the normal

**dwindle** [dwind'əl] *v.* to lessen; to shrink

**myopic** [mī op'ik] *adj.* nearsighted; shortsighted

**obliquely** [ə blēk'lē] *adv.* slantingly; indirectly

**perturbed** [pər turbd'] *adj.* troubled; upset

**precipitously** [pri sip'ə tēs lē] *adv.* abruptly; steeply

**reverberate** [ri vur'bə rāt'] *v.* to echo; to vibrate

**sadist** [sā'dist] *n.* one who enjoys causing pain

**wheedle** [hwēd'əl] *v.* to plead; to coax

# Active Reading

## *A Wrinkle in Time* Chapters 5–8

This section of *A Wrinkle in Time* contains events that are key to understanding the plot. Use this organizer to keep track of what happens on the dark planet as Meg, Charles Wallace, and Calvin seek the home of the Thing.

### The Dark Planet



Camazotz

1. they arrive and find town of complete conformity
- 2.
- 3.
- 4.
- 5.

# Responding

## *A Wrinkle in Time* Chapters 5–8

### Personal Response

What was your impression of the planet of Camazotz? What questions would you like to ask Madeleine L'Engle about this place?

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### Analyzing Literature

#### Recall and Interpret

1. What is the Thing and which historical figures have opposed it?

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2. What is life like for the residents of Camazotz?

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3. What has happened to Meg's father?

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# Responding

## *A Wrinkle in Time* Chapters 5–8

### Analyzing Literature (*continued*)

#### Evaluate and Connect

4. The people on the planet Camazotz have no crime, no responsibility, and no decisions to make. What is so wrong with their society?

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5. Mrs. Whatsit and the children name well-known figures from our civilization who have fought against the darkness. Whom would you add to the list?

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### Literature and Writing

#### Imagery

The details that writers give to help us see, hear, touch, smell, and taste the world are called **imagery**. Write a paragraph about the imagery L'Engle uses to describe Camazotz and the kind of life people have there.

#### Extending Your Response

##### Literature Groups

Is life on Camazotz similar to life on Earth? In your group, make a list of things about Camazotz that remind you of our society. In what ways does modern life ask us to think like the red-eyed man.

##### Performing

The dialogue between the red-eyed man and Meg, Calvin, and Charles Wallace is filled with opposing points of view. Pick a section of chapter 7 and put on a three-minute “radio play” of dialogue. Show in your dialogue the emotions the characters feel.



Save your work for your portfolio.

# Before You Read

## *A Wrinkle in Time* Chapters 9–12

### FOCUS ACTIVITY

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All of our experiences—good and bad—teach us and change us in different ways. Think about experiences that have taught you the most about yourself and others.

#### Journal

In your journal, write about a single experience that made you stronger and wiser in some way. Perhaps you struggled through a difficult task or helped a friend with a problem. What did this experience teach you?

#### Setting a Purpose

Read to find out how Meg's journey changes her.

### BACKGROUND

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#### Did You Know?

Throughout the novel, L'Engle questions the human tendency to fear and misjudge what we do not understand. Camazotz is an extreme example of a world that does not allow differences. What can happen when differences are accepted and valued? In societies that value independence, we often see creativity, inventions, great literature and art, and knowledge. As you read further, notice Meg's struggle to recognize her own unique gifts, especially those she once considered faults. Think about what message the author is trying to send in these final chapters.

#### Internal and External Conflict

In literature, an **internal conflict** is a struggle within a character, such as Meg's struggle between fear and her wish to find her father. An **external conflict** takes place between a character and an outside force, such as the evil power the children must fight. The events of *A Wrinkle in Time* are driven by both internal and external conflicts. In the section you are about to read, the main characters face the most difficult part of their journey. Meg must take more responsibility than she ever imagined she would be asked or able to take. As you read, notice how Meg's internal conflicts affect her ability to face the outside forces in Camazotz. You might also notice how the outside forces that have a hold over Camazotz are like the internal conflicts that keep Meg from realizing her own abilities. Read to find out where these conflicts lead the story.

### VOCABULARY PREVIEW

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**brusquely** [brusk'lē] *adv.* roughly; impatiently

**distraught** [dis trōt'] *adj.* upset; distressed

**emanate** [em'ə nāt] *v.* to flow out; to radiate

**impenetrable** [im pen'ə trə bəl] *adj.* inaccessible; indestructible

**omnipotent** [om nip'ət ənt] *adj.* all powerful; god-like

**translucent** [trans lōō'sənt] *adj.* allowing light through

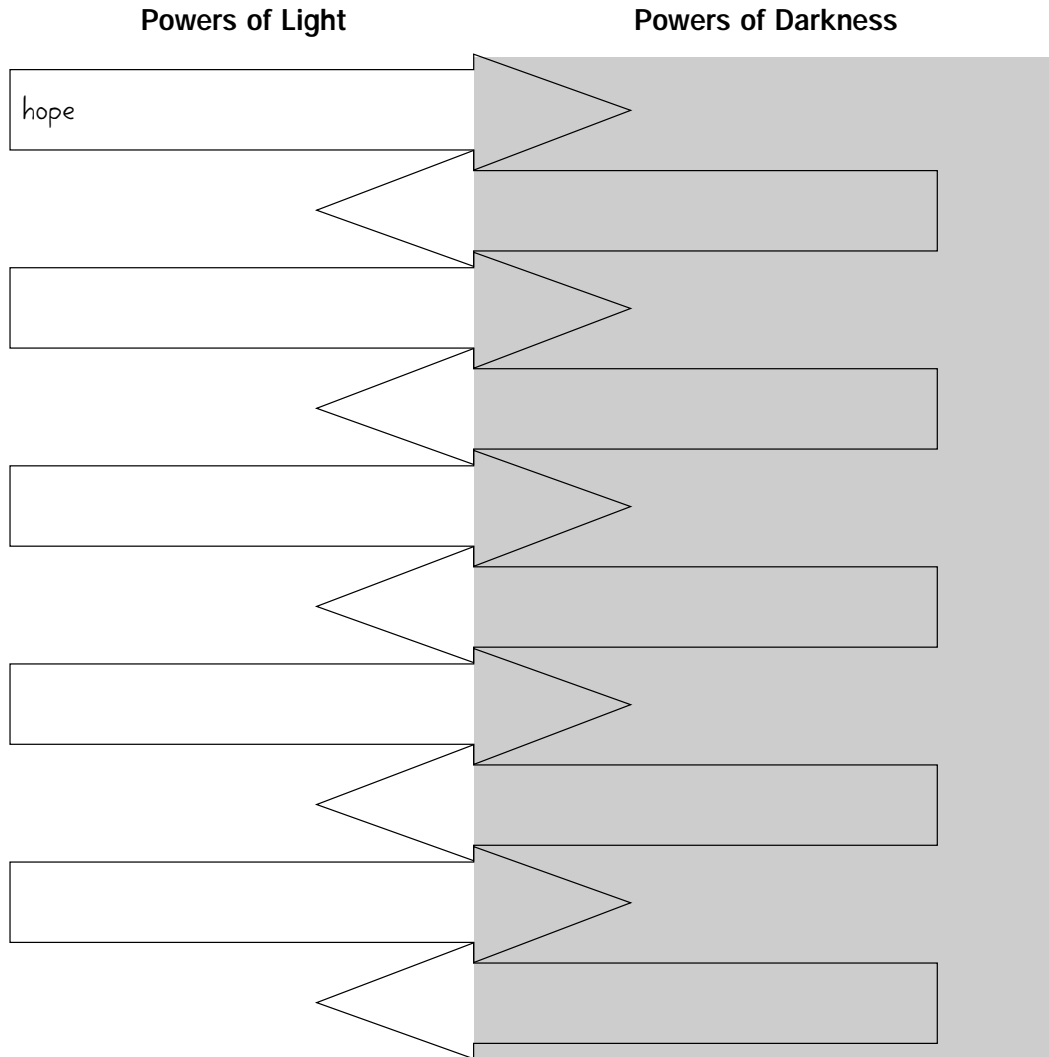
**transparent** [trans pā'r'ənt] *adj.* clear

**trepidation** [trep'ə dā'shən] *n.* anxiety; fear

# Active Reading

## *A Wrinkle in Time* Chapters 9–12

There are no lasers, bombs, or bullets in the battle between the Thing and the people who fight it. With what weapons is this battle conducted? With what weapons does the Thing expect to take over the universe? What weapons do the people use to fight it? As you see those weapons at work in these chapters, use this organizer to list the ammunition each side uses.



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# Responding

## *A Wrinkle in Time* Chapters 9–12

### Personal Response

What did you think of the ending of the book? Were you surprised? What do you think the future holds for Meg, Charles Wallace, and Calvin?

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### Analyzing Literature

#### Recall and Interpret

1. After Meg releases her father, why is she so disappointed in him?

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2. Who is Aunt Beast, and how does she help Meg?

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3. How is Charles Wallace finally freed?

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# Responding

## *A Wrinkle in Time* Chapters 9–12

### Analyzing Literature (*continued*)

#### Evaluate and Connect

4. Why must Meg go alone to Camazotz? How is her relationship with Charles Wallace important to her ability to free him?

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5. Do you believe IT is finally defeated at the end of the book? Why or why not?

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### Literature and Writing

#### Theme

The **theme** of a book is its main idea or message. A work of literature can have more than one theme. *A Wrinkle in Time* deals with many different themes—interplanetary travel, extraterrestrials, family, and school. Ask yourself what L'Engle's book is really about. Then write a paragraph or so explaining what you think is the most important theme of *A Wrinkle in Time*. Support your answer with details from the novel.

#### Extending Your Response

##### Literature Groups

In the **Focus Activity**, you considered what values sustain you as you face challenges. What values help Meg, her family, and friends through their challenges? Discuss this question in your group, and find specific examples in the book that support your conclusions.

##### Science Connection

*A Wrinkle in Time* introduces many concepts from physics and psychology. The novel mentions, but does not explore extensively, topics such as ESP (extrasensory perception), space travel, and extraterrestrials. Pick an idea from the book that interests you, then find out more information about that subject. Write a report on this subject and relate it to the ideas in *A Wrinkle in Time*.

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# A Loint of Paw

Isaac Asimov

## Before You Read

### Focus Question

What types of new technologies have come about in your lifetime? What laws were written or changed to govern these new technologies?

### Background

In his lifetime, writer Isaac Asimov published books about a number of subjects. But he is best known for his science fiction writings. In this humorous short story, Asimov uses a play on words—which he calls the “noblest form of wit”—to raise a “point of law” about time travel.

## Responding to the Reading

1. In what year is this story set?

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2. What point of law is raised in this story?

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3. What do you think happened with the law after the judge handed down this decision? Why?

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4. **Making Connections** If the tesseract had become common knowledge, as time travel was in “A Loint of Paw,” how might it have affected the laws of the world? Give examples of laws that have been made to regulate the effects of technological advances.

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## Making an Outline

Make an outline for a new story patterned after “A Loint of Paw.” First, choose an old saying that can be changed into a play on words. Then, make some notes about possible ideas for a story whose moral or ending will be the saying you have turned into a play on words. Finally, organize your ideas into outline form. Share your ideas with the class.

# Jabberwocky

# The Jumblies

Lewis Carroll

Edward Lear

## Before You Read

### Focus Question

How do writers use language to create a feeling of fantasy or adventure?

### Background

Both of these poems are examples of fantasy, adventure, and nonsense verse. In “Jabberwocky,” a poem that uses invented words, a young boy tries to prove himself by slaying an evil monster. In “The Jumblies,” the adventurous Jumblies win admiration when they take a risky journey. Like L’Engle, the poets use quirky characters and descriptive language to capture their readers’ imaginations.

## Responding to the Reading

1. Describe your impression of the Jabberwock. Does it seem frightening? Why or why not?

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2. Why is it important to the boy to confront the Jabberwock? What is the outcome of their battle?

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3. What vessel do the Jumblies use to go to sea? Explain how their friends react to this sea journey.

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4. What is the mood at the end of the “The Jumblies”? What statement does the poem make about taking risks?

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5. **Making Connections** Fantasy tales are imaginative and use strange or unnatural characters and settings. Science fiction can be described as a type of fantasy, but the two forms do have differences. Science fiction is often set in the future and based in part on science or technology. Fantasy is usually set in an imaginary world and centered around mythical characters. What would you call these poems: science fiction, fantasy, or both? What would you call the novel: science fiction, fantasy, or both? On a separate sheet of paper, give details from each work to support your response. Then explain how the works are both similar to and different from one another.

## Art Connection

Create pictures of some of the strange characters that appear in the poems and in *A Wrinkle in Time*. Base your pictures on descriptive details that are in the selections. Then compare and contrast your work with the work of your classmates.

# from *The Lion, the Witch and the Wardrobe* C. S. Lewis

## Before You Read

### Focus Question

Do you believe in the existence of “other worlds”? Why or why not?

### Background

This selection is taken from the first of seven books that make up *The Chronicles of Narnia* by author, lecturer, and Cambridge University professor C. S. Lewis. In this book, Peter, Susan, Edmund, and Lucy leave London during a time of danger early in the Second World War. They are sheltered with a kindly professor who has agreed to take them in. While exploring the house one rainy day, youngest sister Lucy enters an old wardrobe—a large piece of furniture used for storing coats and other clothing. What she finds inside is a doorway to another world—Narnia, where the White Witch has taken over and made it “always Winter but never Christmas.” Lucy returns from Narnia to tell her brothers and sister, but they think she is making up stories. What Peter and Susan don’t know is that Edmund also has been to Narnia and met the dreaded White Witch, who swears him to secrecy. In this excerpt the children tell the Professor what Lucy says is beyond the wardrobe.

## Responding to the Reading

1. Why do the children finally decide to talk to the Professor about their sister?

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2. Why were Peter and Susan shocked to hear the Professor suggest that Lucy might be telling the truth?

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3. **Making Connections** What character from *A Wrinkle in Time* is the Professor most like? Why?

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## Using Logic

The Professor used logic to support the idea that Lucy was telling the truth about Narnia. He pointed out that there were only three choices in evaluating the truth of a statement: either the person is lying, insane, or telling the truth. Do you think this method of assessing someone’s claims would be reliable? Test this method on several statements made by historical figures or people currently in the news. On a separate sheet of paper, write a brief description of your tests and the outcome of each test.

# Gettysburg Address

Abraham Lincoln

## Before You Read

### Focus Question

What basic freedoms do you feel are most important in a society?

### Background

Lincoln's Gettysburg Address was given during the U.S. Civil War after one of the war's bloodiest battles. In this speech, Lincoln encourages people to keep the ideals of the United States in mind and to remember those who fought for those ideals. He does not want people to give up on the idea of a unified nation. In *A Wrinkle in Time*, Calvin recites Lincoln's speech in order to resist the bad influences of the red-eyed man. Some of the ideas in the address contrast with those of the society that the children discover during their journey.

## Responding to the Reading

1. According to the speech, to what ideals were the founding fathers of the United States dedicated?

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2. What is the "unfinished work" to which the living citizens of the country should be dedicated?

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3. **Making Connections** Contrast the ideals laid out in Lincoln's Gettysburg Address to the practices Meg encounters during her time on Camazotz. Why does she disapprove of these practices?

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## Learning for Life

Often people express their political views in newspapers. On a separate sheet of paper, write a letter to the editor that explains what you believe is positive and strong about your government, as well as what you believe needs improvement. In your letter, explain what you think are the greatest threats to freedom and equality.

# Einstein Revealed: Time Traveler

NOVA Online

## Before You Read

### Focus Question

What does the old saying “Everything is relative” mean to you?

### Background

Before Albert Einstein (1879–1955), most physicists believed in the theories of Sir Isaac Newton (1642–1727), who asserted that space and time intervals are absolute and that the speed of light is relative. In contrast, Einstein theorized that the speed of light is absolute and that space and time intervals are relative.

Although Einstein’s theories are complicated, they are not as hard to understand as you might think. Just imagine that you are standing on a sidewalk watching a train go by. A friend standing in the center of a passenger car of the train is holding a machine that can instantaneously send out forward and backward beams of light. These beams of light automatically open the front and back doors of your friend’s passenger car. When your friend turns on the machine, she sees the front and back doors open at the same time. You, however, see the back door open first. Why is that so? We see objects and events when the light bouncing off them reaches our eyes. For your friend standing in the center of the passenger car, the forward and backward light beams travel the same distance to reach her eyes. For you, however, the back door of the moving train appears to move forward to meet the light pulse, while the front door appears to move away from the light pulse. As a result, from your perspective the back door opens first. How do Einstein’s theories apply to time travel? The Web selections provide an intriguing example.

## Responding to the Reading

1. According to the selections, what is *time dilation*?  
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2. What causes the clock aboard the rocket to move more slowly relative to the clock on Earth?  
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3. What experiment did scientists perform to test Einstein’s theories? Did his theories pass the test? Explain.  
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4. **Making Connections** How might Einstein’s theories apply to the time travel described in *A Wrinkle in Time*?  
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## Science Connection

Use basic library and Internet resources to learn more about Einstein’s theories. You might start with Joseph Schwartz and Michael McGuinness’s book *Einstein for Beginners*, a hardcover comic book that presents accurate information in an easy-to-understand format. Share your findings in a brief oral report to your class.