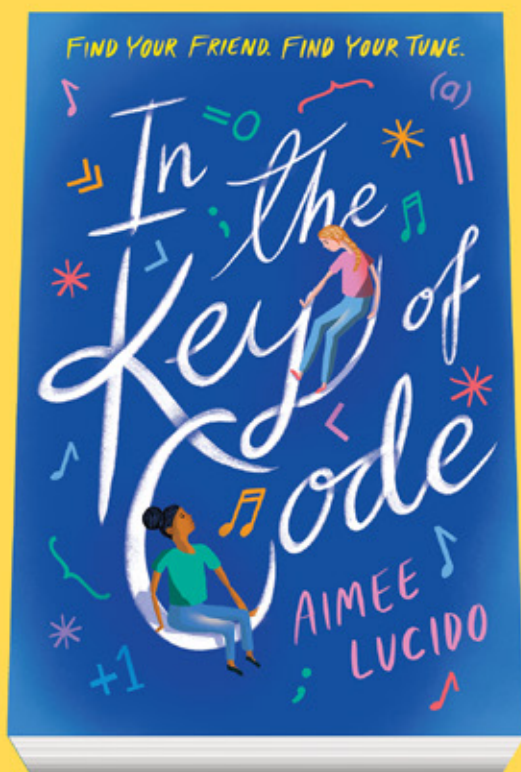


Teachers' Notes



In the Key of Code

AIMEE LUCIDO

“Aimee Lucido’s debut is told in the form of poems, liberally littered with computer code and musical terminology. It is a daring exercise in form that carries its story very well.” *Guardian*

9781406389333 • Paperback • £6.99
10 years + • eBook available

Written in verse, *In the Key of Code* is a first-person novel told from the point of a 6th grade (US) student who is starting a new school year, in a new school, in a new state. Passionate about music but believing she can-not live up to her parents’ talents and the expectations placed on her, that she should have inherited special musical ability, Emmy turns instead to computer programming and discovers a new skill which makes her heart sing.

At the same time, making friends in a new school is challenging and despite best efforts, it seems as though Emmy is destined to be an outsider, until she finds an ally in one of the popular ‘A girls’. Abigail secretly loves computer programming too. The novel charts the ups and downs of Emmy and Abigail’s friendship.

Inspiration for both girls comes in the form of Ms Delaney, the computer science teacher. She is an exceptional teacher who communicates her enthusiasm, ignites passion and supports the girls both intellectually and emotionally. When Ms Delaney becomes sick it is a blow to all the students taking computer science, but they know what to do to repay their teacher for her unflinching interest in them.

And then there is family. Emmy’s family has moved from Wisconsin to California in the hope of giving her father the musical break he has always wanted, but that means making sacrifices, which threaten the stability of family life. Emmy’s mother puts her career on hold in order to support her husband. The demands of her new job create tensions in the family as everyone tries to find their place with the new arrangements.

Lucido’s verse novel is a triumph, pulling together these threads which are overlaid with an introduction to codes and coding, music and of course poetry. Through reading, the connections between these patterned forms of communication are revealed, conveying the message that young learners should not be pigeon-holed as one type of learner with a narrow range of interest. It is possible to love the arts, to enjoy coding, to be a great writer. It is possible to have many talents and more importantly perhaps, to follow your dreams and make your own fairy tale come true.

www.walker.co.uk • #IntheKeyofCode • @AimeeLucido • @WalkerBooksUK



BEFORE READING

Before reading think about what your readers will need in order to be able to access the text. Is the context unfamiliar? Can they draw on their background knowledge and experience? How will you capture their interest?

Building background knowledge and activating prior knowledge will enable the children to access more from the story.

From California to Wisconsin: Studying North America

*'I'd never visited California before we moved here
But I'd heard about it
In songs.'*

The novel opens with Emmy on the way from her old home in Wisconsin (north east USA) to California.

There are several points in the novel where Emmy's feeling of being an outsider is directly related to the different way of living, clothing, food, seasonal changes.

While this change may have significance for children in the US, most students in the UK will be unaware of the huge contrasts between different states in the USA and how moving from one place to another is almost like moving from one country to another. Some prior teaching would support this understanding.

The 2014 National Curriculum in England has the statutory requirement for upper primary children to study the Americas. Start with an introduction to the Americas – North and South - locating them on a globe and using an atlas.

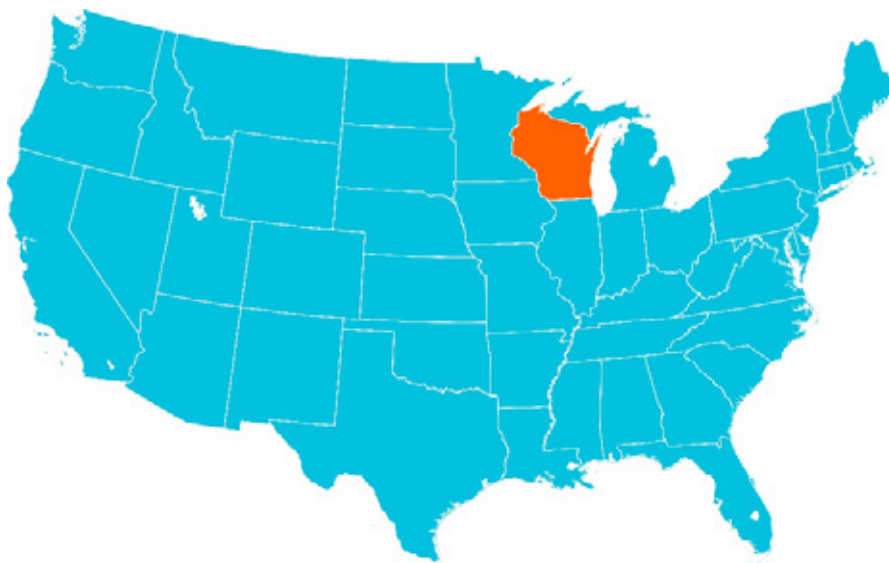
Identify where the Americas are in relation to Britain and identify the route that the first settlers would have made across the Atlantic Ocean.

The Geography Association recommends using a zoom lens approach to look at a couple of contrasting regions. Wisconsin could be contrasted with California. Compare the physical geography: lakes, rivers, terrain, rainfall, temperature, seasons.

As tourism is a major industry for both states, this would make an interesting comparison.

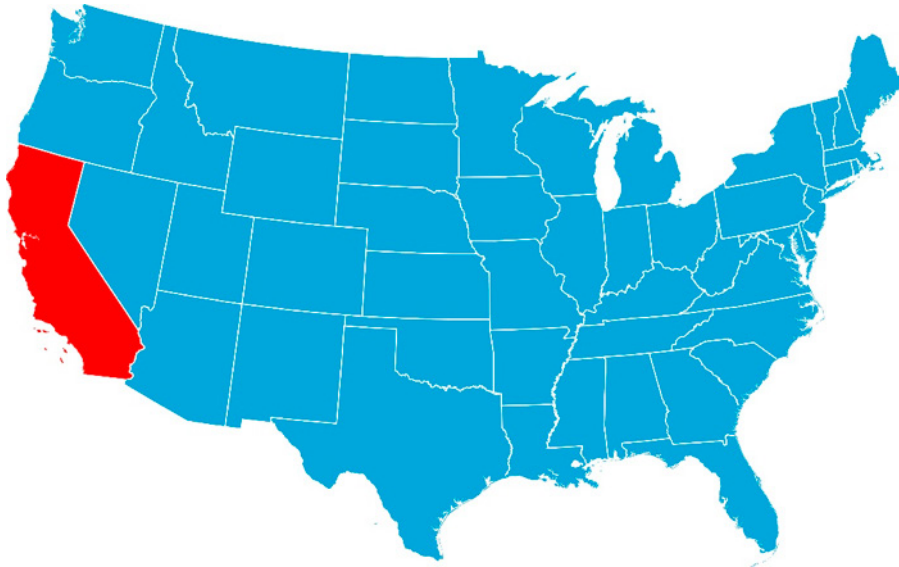
Use a range of sources online and other resources to research:

Wisconsin



- Lakes, rivers and water sports
- Lake Michigan
- The Door Peninsula
- The Ice Age Trail
- Circus Museum

California



- San Francisco
- Golden Gate Bridge
- Yosemite National Park
- Disneyland
- Death Valley
- Sequoia National Park

Key questions to consider before reading:

- If you lived in Wisconsin and were moving to California, what do you think you would most miss about your old home?
- What would you be looking forward to?
- Is there anything that you might be apprehensive about?

Although the children will only be able to offer generalised answers to these questions, they can draw on their new knowledge and personal experiences which will give some insight into Emmy's feelings at the beginning of the novel.

Music Class: studying the history of music

In England, pupils in upper primary are expected to develop a knowledge of the history of music.

Emmy comes from a musical family: her mother is an opera singer, her father a pianist. Music is in her blood and her tastes are eclectic. There are many references throughout the book, and although it's not entirely essential to know all the pieces that are mentioned, there is a great opportunity here to broaden children's musical repertoires.

Before reading create a musical timeline for the classroom. You could theme it by making the timeline look like a musical staff. As each piece of music is introduced, research the artist and the time period and add to the timeline. Children can produce zig-zag book versions for personal reference.



Some of the music referenced in the text

Artist/Composer	Name of Song/Piece
2pac	Hail Mary (note X rated lyrics)
Adele	...
Johann Sebastian Bach	The Well-Tempered Clavier
Ludwig van Beethoven	Minuet in G
Ludwig van Beethoven	Moonlight Sonata
Ludwig van Beethoven	Sonata No. 20 in G Major
Ludwig van Beethoven	Symphony No.5 in C Minor
Georges Bizet	Carmen habanera
Johann Friedrich Franz Burgmüller	The Limpid Stream
Frédéric Chopin	Fantasia Impromptu
Arcangelo Corelli	Christmas Concerto, Adagio
Miley Cyrus	...
Claude Debussy	Clair de Lune
Claude Debussy	Suite bergamasque
Ella Fitzgerald	Lost in a Fog
Ella Fitzgerald	Summertime
George Gershwin	Rhapsody in Blue
George Frideric Handel	Messiah
Jimi Hendrix	Purple Haze
Billie Holiday	Blue Moon
Lady Gaga	...
Franz Liszt	...
Madonna	...
Wolfgang Amadeus Mozart	Don Giovanni
Wolfgang Amadeus Mozart	Requiem
Wolfgang Amadeus Mozart	Rondo in C Major
Katy Perry	California Gurls
Bobby Pickett	Monster Mash
Giacomo Puccini	Madama Butterfly, 'Con onor muore'
Queen	Don't Stop Me Now
Rihanna	...
Nikolai Rimsky-Korsakov	Flight of the Bumblebee
Schoolhouse Rock!	...
Franz Schubert	...
Robert Schuman	...
Taylor Swift	...
Pyotr Ilyich Tchaikovsky	Piano Concerto No.1
The Beach Boys	California Girls
The Cars	...
The Mamas and the Papas	California Dreamin'
Vienna Boy's Choir	...
Stevie Wonder	Sir Duke
Yo-Yo Ma	...

Teacher's note: Katy Perry's 'California Gurls' seems to be totally lacking in irony and the lyrics (probably not the music video), could be used as part of the discussion about gender stereotype that the book invites. This would be best undertaken after reading the novel when gender roles have already been questioned. Ensure you are familiar with lyrics and any videos before using them in the classroom.

2pac's 'Hail Mary' has x rated language.

In the Key of Code: Title Discussion

Before showing the book, display the title on the interactive whiteboard.

- What do you think this story might be about? After taking initial discussions prompt the children to think about the word 'key' and its different meanings. And then consider the word 'code'. Leave suggestions open at this point.
- Next reveal the cover. Are there any further clues from the cover?



DURING READING

Section 1 From *California Dreaming* to *By the Way...*

Discussion

- What do we learn about Emmy in this introduction?
- Have you ever been in a situation where you felt you didn't belong? How did you deal with it?

Responding to Literature

- What do you notice about the way this novel is set out?
- Start an emotions chart or graph to chart Emmy's changing emotions as you read through the novel. At key points make a note of how she is feeling. What are the causes? How does she respond?

You might use these mood cards to extend the range of children's responses. Use the blanks to add your own alternatives:

depressed	confused	apprehensive
anxious	relaxed	uneasy
lonely	contented	fortunate
angry	cheerful	unwanted
surprised	reassured	abandoned
enthusiastic	lonely	
eager	isolated	

- Which words or phrases give an indication of how Emmy is feeling?

Thinking about loneliness

At the beginning of this novel Emmy feels lonely, even though she is surrounded by other pupils at school. Introduce the children to the work of the philosopher Montaigne. He often felt lonely as he did not have much in common with the people in his locality. By travelling the world, he discovered that this feeling was relative. That even if we feel lonely or like an outsider, there are other places where we will fit in. Montaigne wrote a book about himself and his interests. The response was very positive. This led him to discover that there are lots of people who have common interests with you, but you may not yet have met them.

Distribute paper and envelopes and invite the children to write honestly about their feelings of loneliness.

- When do you feel most lonely?
- What sorts of things make you feel lonely?

Explain that nobody is going to read this, it is just for them. When they have finished, give them an envelope which they can seal and take home.

Make the point that it is positive to recognize when you feel lonely and that everybody has these feelings at some point. Remember there is someone, somewhere who understands you and has the same feelings.



Section 2 *From None of the Above to Whole Rest*

Responding to Literature

Print copies of Option A and use coloured highlighters to divide this section into 4 speaking parts.

Re-read Option A aloud to the class. Then distribute the highlighted scripts. Ask:

- What do you notice about the way this chapter has been set out on the page?
- How might the layout help us read the chapter?
- In groups of 4, ask the children to practise reading the chapter aloud, Readers Theatre style.
- After allowing time for practising, gather the class and ask if any groups would like to read the chapter to the class. Suggest the children disperse themselves around the classroom so the voices come from different places.
- Why does Emmy describe herself as the 'diminished fifth'?

Discussion

In this section Emmy continues to feel like an outsider although there are signs that she is starting to make a connection with 'the girl in braids', Abigail.

- Why does Emmy refer to her as 'the girl in braids', even when she learns that her name is Abigail?
- Emmy and her mother both reply 'fine' when they are asked how their day has been. What do they mean when they say this? Are they being truthful?
- Do you sometimes say one thing when you mean something else? What reasons do you have for doing that?



Section 3 *Option D to So I Don't Get My Hopes Up*

Discussion

Emmy starts her new computer science class and gets to know Abigail. One of the students, a boy called Francis, is disruptive and disrespectful.

Re-read Orchestra One vs Orchestra 2. You could divide into two parts in a similar way to the Readers Theatre task that you did with Option A.

- How does the way that the page has been laid out help to communicate the author's message?
- Why does Francis fail to understand that the computer science teacher is not a Mr Delaney?
- Do you think some people have the attitude that there are some jobs that are best done by men and some jobs that are best done by women? Encourage an open discussion. Allow children to express authentic thoughts in order to question and explore alternative points of view.
- You could share this YouTube clip with the class. <https://www.youtube.com/watch?v=qv8VZVP5csA>
Why do you think the children all drew men in these roles?

Response to Literature

- What do you learn about Emmy in this section?
- Does she like Abigail? What makes you think that?
- Does she like Francis? What makes you think that?
- Does she like Ms Delaney? What makes you think that?

- Do you have any thoughts about the different roles that these characters will play in the story as it unfolds?
- Add to the emotions graph to indicate what Emmy is thinking at this point in the story. Explain to your partner the causes of her emotional state.



Section 4 04.00 pm to Anticipation

Discussion

- Emmy's dad is a pianist. Emmy describes him as playing the piano 'the way some dads play golf'. What does she mean when she says 'But tonight he's not playing, he's *practising*.' If needed, direct the children's attention to the italicised word. Why has it been written like this?
- Do any of you play an instrument, take a dance class, a drama class, play a sport or have another skill that you have to practise? Invite the children to share experiences.
- Introduce the children to another philosopher, Nietzsche. One of his big ideas was that professionals make playing a violin or football, stand-up comedy look easy, but it has taken years of practice and they are likely to have had many failures on the way. People don't always tell you about the challenge and how long it will take to learn. However, it is more helpful to tell people that a new skill will be hard and take a lot of practice than it is to pretend that it will be easy. Nietzsche says that because we are afraid of failure, we tell ourselves that we don't want the difficult things. Nietzsche said we should admit that things are hard but do them regardless, knowing that they will get easier and we will be rewarded for our efforts.
- Working individually, give the children some time to think about something that they think is hard, but they would like to learn. Model by giving some examples of your own. For instance, I would like to learn to speak Mandarin Chinese, so that I can travel in China and talk to local people. Or I would like to learn to be a very strong swimmer, then I will be able to swim in the open sea with confidence.
- When they have had time to think about the hard things they would like to achieve, ask them to share their thoughts in small groups.
- Gather the class together. How do you think this discussion about hard skills relates to the characters in the story?

Responding to Literature

Re-read 4'33 make sure the children can see a copy of the book as the visual look of the page is important. Read aloud expressively as the text layout encourages you to do.

- Ask: did you notice anything about the way that I read that?

Working in pairs, ask the children to discuss the statement 'The text design (layout and font) in *In The Key of Code* is an important part of conveying Emmy's feelings'. Tell the children to start their discussion with this chapter but they can look in other chapters for other examples, if they want to.

- Gather the class and discuss the answer. Can the children explain by referring to specific examples?



Section 5 Songs in the Key of Life to Dad's Song 4.00 pm

Discussion

Re-read the chapter Songs in the Key of Life.

- Emmy explains the emotional effect that music has on her. Have you ever listened to a piece of music that made you feel happy?
- Have you ever listened to a piece of music that made you feel sad, or angry?
- When you hear a piece of music, does it trigger memories?

Most people report feeling emotions when listening to music. How we feel has a strong influence on the music that we choose to listen to. Scientific evidence shows that heart rate rises when we listen to up tempo music and that slow descending notes have a calming effect. Research has also shown that music has the power to evoke emotional memory.

Play Stevie Wonder's 'Duke' or Pharrell Williams 'Happy' and simply enjoy moving to the music.

Responding to Literature

- How has Emmy changed in this section? What are the reasons for those changes? Mark them on the emotions graph or chart.
- Why is the Soup or Salad joke funny?



Section 6 *The New Schedule to Semicolon*

Responding to Literature

Duets

Re-read the chapter Emmy and Abigail: An Actual Duet. Make sure the children can see a copy of the text as you read it aloud.

- Why do you think it has been written in this way?

Working in pairs, use the Readers Theatre technique that you used earlier and practise reading the chapter.

Next ask the children to look back through the novel to find chapters that look similar to this one.

Writers often use patterns in their stories. Aimee Lucido has used the recurring quartet, duet and solo structure.

- What purpose does the format serve in helping to advance the story?

Re-read the chapter Semicolon.

- How does the semicolon work in a piece of writing?
- How does a semicolon work in code?
- Can you see a connection?



Section 7 *Abigail is Sick to Duo + 1*

Discussion

- Emmy says that Francis feels bigger and bolder when Abigail is off sick. What does she mean?
- What does Emmy notice about Ms Delaney in this section? Do you have any thoughts about that?
- Why do you think Abigail is secretive about her friendship with Emmy?

Responding to Literature

In the chapter Small Steps Emmy says:

*Why did no one tell me
That in San Francisco
October
Is when the sun starts to shine?*

- How does the weather reflect Emmy's mood at this point in the story?
- Writers often use the weather as a device to reflect a character's emotional state. It's called the pathetic fallacy. Can you find any other examples in the story so far where the weather has reflected the way that Emmy is feeling?
- What sort of weather could be used to help create a sense of anger, or a broken heart?



Section 8 *Ms Delaney's Fairy Tale to Francis' Fairy Tale*

Discussion

Re-read the chapter Errors.

- Why is Ms Delaney excited when Emmy and Abigail's code spits out an error message?
- Can you recall a time when you learnt something useful following a mistake? Share your thoughts with a partner.

Teacher's note: You may want to model an answer using your personal experience to encourage the children to share their own examples.

Gather the class and make the point that making mistakes is a natural part of learning. How we respond to our mistakes is important. Do we give up or try again? Remind the children about the discussion of Nietzsche's ideas.

Response to Literature

Re-read the three Fairy Tale Chapters: Abigail, Ms Delaney and Francis. This is another example of a repeating pattern.

Working in groups ask the children to discuss:

- What is similar in each of the fairy tales?
- What is different?
- What do you imagine Emmy's fairy tale would say?

This could be extended into a writing task.



Section 9 *Not Quite Boolean to Digital Music*

Discussion

Re-read the chapter Slam to Avoiding.

- How does Francis' behaviour change over the course of these chapters?
- How do you account for that change? Use evidence from the text to support your ideas.

Responding to Literature

In pairs or small groups, ask the children to re-read the chapter String [] itemsOnMsDelaneysDesk = and then discuss:

- What do you learn about Ms Delaney from the items on her desk?

Invite the children to write their own string of items. The idea is to convey something about your personality in no more than 8 items.



Section 10 *String[] whyMsDelaneyLeftHerJob to Machine Learning*

Discussion

Re-read the chapters Artificial Intelligence and Machine Learning.

Pose the question: what do you think about when you hear the words Artificial Intelligence or AI? Without discussing with anyone draw what comes into your head.

It is likely that most children will draw robots or a variation on the robot theme. If children have an Alexa, Echo or other similar device they may draw that.

- What features do the different kinds of AI have in common? Possible answers might mention voice or sight recognition.
- Show some images of other relatable programmes YouTube, Instagram, WhatsApp, Snapchat. What do these have in common?

AI is comprised of three elements: Dataset – learning algorithm – prediction.

How does this work? If you are using Instagram, the ads that you see will be based on predictions that the algorithm makes based on your previous behaviour. If you click on an ice-cream advert, it will show you more ice cream adverts.

- What are the potential benefits of this type of prediction? (Adverts targeted to what you want.)
- What are the potential problems of this type of prediction? (Limited range of adverts. There will be things you are not shown that you might want to see.)
- What is the benefit to Instagram (or other platform) of having a recommendation algorithm? (The more recommendations we click on, the more adverts we see, the income is generated for the companies that own the platforms. It is their major revenue stream.)

It's not only advertising that uses learning algorithms. News stories and articles can also be selected for us based on our preferences. The algorithm can learn what it thinks we want to read and show us more of the same. This is called an echo chamber.

- Do you think Ms Delaney likes the concept and application of AI? Use evidence from the text to support your opinion.
- Do you think we should keep trying to make machines that are more and more like humans?
- Robots are sometimes companions to humans in films. Do you think a robot can be a friend or companion in real life?
- Look at this short film which shows a robot being used as a companion for the elderly. Do you think this is a good idea? <https://www.youtube.com/watch?v=XuwP5iOB-gs>
- Do you think sophisticated AI robots should have the same rights as humans?



Section 11 *White Space to Knocks Me Off My Feet*

Responding to Literature

- Why does Emmy reveal her secret friendship with Abigail?
- Do you think she was right to do this? Encourage the children to try and persuade the rest of the class to their point of view by giving reasons.
- Describe the range of emotions that Emmy experiences in this section and make notes on your emotions graph.
- What do you notice about the pattern? (It should be undulating.) Most stories will have a pattern of ups and downs. If a story was all on one level, it wouldn't be very engaging.



Section 12 *Emmy and Abigail: The Apology Duet to Emmy's Fairy Tale*

Responding to Literature

Re-read the chapter Fine.

In pairs or small groups discuss how this chapter is written.

- Which word is repeated frequently? Where has this word be used before?
- How does the look of this chapter on the page contrast to the chapters before and after?
- Why do you think Aimee Lucido may have chosen to set it out like this? How does it encourage you to read it?

Now re-read the chapter Not Fine

- How is this scene at home different from the other scenes between Emmy and her mother? (She has stopped using the word fine There is more honesty in their conversation.)

Re-read the chapter Emmy's Fairy Tale.

- Is this story close to how you imagined it?
- What is the effect of 'as far as she knew' in the final sentence?



Section 13 *String [] what Emmy Says To Abigail to No Telling* Responding to Literature

Now that Emmy has learnt a lot about code, more coding symbols are being used in the text. How do the coding symbols reflect what is happening in the story?

Provide some photocopies of different chapters for different groups and highlighter pens. Ask the children to highlight and annotate the text you have given them with explanations of how the code is being used.

Gather the class together and discuss the effectiveness of the examples they have selected.

When the children plan to visit Ms Delaney, they decorate their cheeks with her candy-apple-red lipstick. Different colours can evoke different emotions.

- What does the colour candy-apple-red convey?
- Do you think it is a good colour choice for Ms Delaney? Explain your thinking.
- How did you feel when you read that Ms Delaney wasn't wearing her lipstick?



Section 14 *Subito Piano to Emails: Opus 3* Responding to Literature

- What changes take place in Emmy's family and how does this affect her emotionally?
- Add your thoughts to your emotions graph.

Now read to the end of the story.



AFTER READING

Personal Response

Use a Booktalk format to record your thoughts after finished the story:

- What did you like/dislike?
- What did the story remind you of? (It could be other books, films, things that have happened to you or that you have seen on the news.)
- Was there anything that you found puzzling, confusing or surprising?
- If you could ask the author a question, what would it be?

In small groups share your thoughts.

- Did anyone have a different idea from you?
- Did you learn anything from listening to someone else's point of view?

Themes

- What do you think are the most important themes in the story? Find two or three quotations to support your suggestion.

FURTHER READING



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Just Imagine is a Centre for Excellence in Reading and runs reading programmes and training for teachers across the UK.