



Bio-pirate

Michele Martin Bossley

Interest level: ages ten to fourteen

Reading level: 4.0

978-1-55143-893-1 PB

978-1-55143-895-5 LIB

AR QUIZ #126432

Book Summary

Trevor, Robyn and Nick decide they have a mystery to solve when Trevor discovers a suspicious-looking young man snooping around. Then the kids learn that research involving the use of carob beans to aid in cancer treatment is missing. With a shady-looking grad student, a bitter activist and an employee of a medical research firm to deal with, our amateur sleuths are faced with their greatest challenge yet.

Author Biography

Michele Martin Bossley is an award-winning author and has written more than a dozen children's sports books, including *Jumper* and *Kicker* in the Orca Sports series, and Orca Currents *Swiped* and *Cracked* (both starring amateur sleuths Trevor, Robyn and Nick). Michele lives in Calgary, Alberta, Canada.

Connecting to the Text

Character Description

1. To encourage descriptive writing and adjective use, read the following character descriptions aloud to the class:

(p. 5) *Tall, athletic and freckled, Robyn didn't usually take guff from anyone.*

(p. 8) *[Finn] had a scruffy goatee, a nose ring and a tattoo on his upper arm.*

- Identify the descriptive words in the sentences. How do these adjectives expand our understanding of these characters?
- Describe the main characters in *Bio-pirate*, based on what you know from the novel. Use at least two adjectives in each description.

Trevor _____

Nick _____

Meredith _____

Nola _____

- Write a descriptive paragraph of a celebrity, sports or political figure, musician, movie star, etc., or fictional character.

Option: Ask students to leave out the name of the person they're describing. Then ask students to read their sentences and paragraphs aloud. Can other students guess who they're describing?

Plot, Theme and Point of View

1. At the end of *Bio-pirate*, Nick comments that the news media will have an interesting story to report based on what they hear over the police scanner. He says, "Think about it...break and enter in progress, stolen research, three teenage kids assaulting [a] woman with sprinkler system" (p. 109). Ask students to work in small groups to develop a skit of the evening news team reporting on the story.
 - The skit should include the news anchors reporting broadly on the story, as well as field reporters giving live interviews with eye witnesses or key participants (Trevor, Robyn, Nick, Finn and Meredith).
 - After each group's presentation, lead a large group discussion on point of view. For example, what is Meredith's point of view, compared to Finn's? What motivated her to steal the research? What motivated Finn to plant phony research?
2. In *Bio-pirate*, the Faculty of Medicine at the University of Calgary is the setting for a day camp. Trevor, Nick and Robyn learn that their camp is held in a "major medical research facility" (p. 2) where they are "testing new treatments and drugs [and] developing new medical procedures"; "These people are looking for the cure for cancer" (p. 3). A number of topics are introduced, including:

Ethics in Research

- (p. 5) ...*the university's policy has more to do with public safety than biological piracy.*
- (p. 57) ...*a new cancer drug...could be worth billions—if it works.*
- (p. 63) [*Meredith's sister*] *can't afford to wait for years until a new treatment is approved. She needs it now...Why not try something, if it could help save your life?*
- (p. 101) ...*there are people who are dying. They need this research, and they need it now. Not in two years when it's gone through all the red tape.*

As a group, discuss these quotations, encouraging students to identify key issues and themes. For example, *Is it okay to release drugs early, without extensive testing, to people who can't afford to wait?* Then, divide students into four groups, with each assigned to represent the point of view of:

- A researcher working at the university for the public good;
- The pharmaceutical company looking to market and distribute new drugs;
- Meredith and her sister, a patient with terminal cancer; and,
- A government representative who must ensure drugs are safe before they are mass-produced.

Allow time for each group to reflect on the issues and prepare to make a presentation. Encourage students to draw evidence and direct quotations from *Bio-pirate* when presenting their point of view to the class.

Prompt: What motivates each to their unique point of view? Ethically speaking, is there a right or wrong position? Although you may feel strongly one way, can you appreciate and understand another's point of view?

Novel Study—Fill in the Blanks Worksheets (Use worksheets on the following pages.)

Option One: Group Discussion

Ask students to guess the missing words as you read the sentences aloud. After each sentence, ask students to reflect on what was happening in the story at the time of the quote.

Option Two: Individual Novel Study

Distribute the worksheet and have students complete the missing words.

Option Three: Student-Created Worksheet

Ask students to design their own missing words worksheets, by choosing sentences from the novel. Then, have students exchange their worksheets, inviting other students to find the missing words. Be sure to remind students to create an answer key for their worksheets.

Fill in the Blanks Worksheet for Group Discussion (2 pages)

Chapter	Sentence(s)	Answer(s)	Page
1	These people are looking for the cure for _____.	cancer	3
1	I've read about cases where research teams learn about _____ medicines from third _____ countries.	ancient, world	4
1	He had a scruffy goatee, a nose ring and a _____ on his upper arm.	tattoo	8
2	Bio-piracy is a real issue, and it needs to stop. I'm thinking about _____ a rally.	organizing	13
2	There have been some terrible _____ where people have been taken advantage of. But most research is done for the public good. You need to be careful about these _____.	instances, accusations	13
2	But it looks more like he's planning to set up a _____ than a bedroom suite.	laboratory	20
3	The swimming pool was located inside the _____ building on the campus.	Kinesiology	21
3	A large envelope marked _____ in red letters was ripped open.	confidential	28
3	Behind us, the sound of _____ made us freeze.	footsteps	30
4	She led us through the _____, turned several corners and then up a set of stairs.	corridors	33
4	"No more games. You don't know what you're dealing with here. I need that backpack. Now hand it over!" He made a _____ move toward her.	menacing	36
5	"I'm in an _____ program at school. I have to take a summer course. It's brutal."	accelerated	40
6	One by one we slithered through the bushes, avoiding the _____ light attached to the garage.	motion-detector	46
6	"Who would be watering their lawn after a _____ anyway?" Robyn complained.	rainstorm	48
7	"Whoa, whoa, whoa!" Tattoo Guy let go of me and held his hands up in _____.	surrender	50
7	"I can't tell you." Finn smiled with the pleasantness of a piranha. "It's _____."	classified	52

Orca Currents Resource Guide

Chapter	Sentence(s)	Answer(s)	Page
7	“Parts of the bean seemed to point toward helping rebuild _____ cells. I thought this might be a helpful part of cancer _____, if I could develop it.”	damaged, therapy	55
8	“Sometimes _____ lead to wonderful discoveries when it comes to science. That’s what _____ are about, right?”	accidents, experiments	62
8	“But you told Nola at camp that new _____ had to go through strict _____ to make sure that they worked.”	treatments, testing	63
9	“She never made it into the _____ studies program. They rejected her application.”	graduate	69
10	“We’re running out of time, you guys,” said Robyn as we walked home Monday afternoon. The _____ was tomorrow.	deadline	76
10	“Why was Nola paying Finn off? Could she be _____ after all? Robyn was sure Nola was the _____, and she’d just mentioned using Finn’s notes...”	involved, culprit	78
11	“So what’s more important? Saving what could be the most _____ cure ever for mankind or worrying about a little thing like _____?”	important, trespassing	88
11	“Isn’t _____ photocopying something just as bad as stealing?”	secretly	90
12	“Listen, little girl, there are people who are _____. They need this research, and they need it now.”	dying	101
12	“The university had a chance to have me on their research team. They blew it. They turned me down. Any money I make off this is _____.”	justified	102
12	“What you had in that file folder was the Latin _____ of a recipe for chocolate chip cookies!”	translation	105
13	“There’s no rush now that Meredith has been _____.”	caught	107
13	“Since you were researching carob beans which grow in other _____, we figured she was involved somehow.”	countries	108

Fill in the Blanks Worksheet for Individual Study (2 pages)

Chapter	Sentence(s)	Answer(s)
1	These people are looking for the cure for _____.	
1	I've read about cases where research teams learn about _____ medicines from third _____ countries.	
1	He had a scruffy goatee, a nose ring and a _____ on his upper arm.	
2	Bio-piracy is a real issue, and it needs to stop. I'm thinking about _____ a rally.	
2	There have been some terrible _____ where people have been taken advantage of. But most research is done for the public good. You need to be careful about these _____.	
2	But it looks more like he's planning to set up a _____ than a bedroom suite.	
3	The swimming pool was located inside the _____ building on the campus.	
3	A large envelope marked _____ in red letters was ripped open.	
3	Behind us, the sound of _____ made us freeze.	
4	She led us through the _____, turned several corners and then up a set of stairs.	
4	"No more games. You don't know what you're dealing with here. I need that backpack. Now hand it over!" He made a _____ move toward her.	
5	"I'm in an _____ program at school. I have to take a summer course. It's brutal."	
6	One by one we slithered through the bushes, avoiding the _____ light attached to the garage.	
6	"Who would be watering their lawn after a _____ anyway?" Robyn complained.	
7	"Whoa, whoa, whoa!" Tattoo Guy let go of me and held his hands up in _____.	
7	"I can't tell you." Finn smiled with the pleasantness of a piranha. "It's _____."	

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8	“Sometimes _____ lead to wonderful discoveries when it comes to science. That’s what _____ are about, right?”	
8	“But you told Nola at camp that new _____ had to go through strict _____ to make sure that they worked.”	
9	“She never made it into the _____ studies program. They rejected her application.”	
10	“We’re running out of time, you guys,” said Robyn as we walked home Monday afternoon. The _____ was tomorrow.	
10	“Why was Nola paying Finn off? Could she be _____ after all? Robyn was sure Nola was the _____, and she’d just mentioned using Finn’s notes...”	
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13	“Since you were researching carob beans which grow in other _____, we figured she was involved somehow.”	

Vocabulary Enhancement through Drama and Storytelling

1. The following words/terms are based on two themes visited in *Bio-pirate*: solving a mystery and scientific research. Invite students to use six of the following words in a skit or short story. Students may choose from the ideas below or create their own.

Solving a mystery

- Our teacher had no idea where his mark book went. It was there yesterday when he left for the day. When a few of us began looking for clues, we found some puzzling evidence in the classroom...
- When we came back from the library, our coatroom was a mess. There were backpacks open and their contents were spread all over the floor—including all our personal stuff. We noticed the window was open and there were footsteps in the snow below...
- We had a theory about who stole all the money we raised for the field trip to the amusement park. We just had to prove it...

accusations	dangerous	missing	secretly
arrested	disappeared	motion detector	sneaking
cautiously	discovery	notes	speculated
classified	envelope	observed	stole
coincidence	evidence	panic	strange
confidential	footsteps	police car	suspect
connections	interrogate	proves	suspiciously
culprit	investigating	realized	theory

Scientific research

- When we saw the laboratory in the basement of the old abandoned house, we just had to find out more...
- We learned a lot on our field trip to the university. The best part was...
- Our friend is really sick but she doesn't want to take her medicine or go to her therapy sessions. We had better teach her a lesson—before it's too late...

ability	herbal remedy	perseverance	research
advances	isolate	procedure	response
discovery	laboratory	radiation	testing
experiment	medicine	replicate	treatment

Connecting to the Curriculum

Research and Discovery Projects—Science, History, Social Studies

1. While at science camp, Trevor’s robot catches fire. Meredith puts the fire out with a fire extinguisher and asks all the students to leave the building. Research the five classes of fire (A, B, C, D and K). For each, explain what is fueling the fire and what is necessary to contain or put out the fire.
 - From what you have learned about the five classes of fires, what kind of fire occurred in *Bio-pirate*? (See pages 6-7). How do you know?
 - Does your classroom and school have a fire procedure? Do you have smoke detectors in your home and an evacuation plan?
Option: Invite a firefighter from your local fire station to visit your class to talk about fire safety.
2. Finn explains to Trevor, Robyn and Nick that his research on the carob bean is important because “in countries where people don’t have access to good medical facilities, they can die from dysentery. Especially young children” (p. 54). Research dysentery. What causes it? What are its main symptoms, and why is it more common in some parts of the world than in others? What are the two main treatments for dysentery?
3. Meredith says, “Sometimes accidents lead to wonderful discoveries when it comes to science. That’s what experiments are about, right?” (p. 62). Research a medical breakthrough that occurred because of happenstance or in some part by accident. Tell the story of the breakthrough. How did the discovery have a positive impact, and to whom? Ideas could include: the discovery of penicillin (antibiotic used to treat infection); the discovery of quinine (from the cinchona tree, used to treat malaria); x-ray technology (led to diagnostic imagery technology); and the smallpox vaccine (led to vaccination as a preventative medicine in public health).

Option: Ask students to draw from *Bio-pirate* in their research. For example, Dr. Pierce says that “most medical research is done for the public good” (p. 13) and medical research “takes a great deal of perseverance” (p. 14). Were “the public good” and “perseverance” part of the medical breakthrough you chose?

For ideas, see United States Public Broadcasting Service (PBS) program Nova online article “Accidental Discoveries” by Lexi Krock. www.pbs.org/wgbh/nova/cancer/discoveries.html. PBS Online has extensive educator resources, including classroom tools, resources, and interactive activities, and has an extensive A-Z catalog of topics. See <http://www.pbs.org/wgbh/nova/teachers>.

4. Robyn wanted to photocopy the research from Meredith’s office at Seaton Pharmaceuticals, but Nick says, “Isn’t secretly photocopying something just as bad as stealing?” (p. 90). Research the photocopying policy in your school, community library or a local college. What are students allowed to photocopy, and what are they not? Who do these policies protect, and why? Interview your school’s librarian. S/he will be able to provide resources for research and exploration on copyright laws and photocopying.
5. Finn can write some Latin. Research five Latin terms commonly used by doctors or pharmacists. For example, a doctor might write on a prescription pad, *ut dict.*, which means “as directed” (in Latin, *ut dictum*). What are some Latin terms used in the medical field, and what are their translations? Why do medical professionals use Latin and Latin abbreviations?
6. Research and write a definition of bio-piracy. For example, *Bio-piracy refers to the commercialization of traditional or indigenous medicines, where...as in the case of...* Encourage students to incorporate quotes from *Bio-pirate* into their project.
7. Research a famous scientist who discovered an important drug or procedure. Examples could include: Virginia Apgar, who designed a scoring system for newborns which increased infant survival rates; Marie Curie, who discovered radioactivity; Frederick Banting and Charles Best, who discovered insulin. Students should answer the following questions:
 - Where was s/he born and where did s/he grow up?
 - Why is s/he famous? What was her/his discovery?
 - What effect did this discovery have on modern medicine?

Option: For current discoveries in science and medical research, you may wish to share with the large group *Time Magazine’s* “Top 10 Medical Breakthroughs for 2007” by Catherine Guthrie: www.time.com/time/specials/2007/top10/article/0,30583,1686204_1686252_1690372,00.html. *Note:* Be sure to preview this online article to ensure that content is appropriate for your students.

Personal Planning—College Life

1. Trevor, Nick and Robyn attend a summer science camp at a university. While attending the camp and solving their mystery, they learn about the university campus and college life. Ask students to complete one of the following, either individually or in pairs.

Option One: Research Summer Camps

- Choose a college or university in your city which offers a summer camp program in the computer science and technology fields, physical education or through another faculty.