

Sampling Snot

- 1 Karina Acevedo-Whitehouse tied herself to a boat. Then she leaned overboard as far as she could. She was trying to catch something. Despite the danger she put herself into, it wasn't working. Karina was not accomplishing her goal. Karina was a veterinarian and a conservation biologist. She was trying to collect whale snot.
- 2 Scientists knew very little about the fungi, bacteria, and viruses that lived inside whales. This was due to the marine mammal's massive size. It's not so easy to take a blood sample or any other kind of specimen from an animal swimming free in the ocean. It's especially difficult when it's from an animal so huge and powerful that one turn of its body or flip of its tale could mean a scientist's untimely death.
- 3 When a whale spouts, warm snot, vapor, and other biological materials come rocketing out of its blowhole. After seeing some huge whale 'blows' in the Gulf of California, Karina realized that if she could obtain a snot specimen, she could use it to see what was living inside a whale's lungs. When Karina's initial attempts failed, she didn't give up. Instead of leaning over the boat, she attached petri dishes to long poles that she could hold over blows. This worked fine for whales like the grey and sperm whales, because they didn't mind being close to a boat. For shyer whales, such as the blue whale, Karina used toy helicopters that were remote-controlled.
- 4 Karina's idea and sampling techniques proved to be a step in the right direction. Other scientists began looking at whale snot, too. They used it to analyze the mammal's DNA and microbiome. They used it to check the whale's stress and pregnancy hormones.
- 5 Today, poles and toy helicopters are old hat. A special drone called a SnotBot is being tried. The SnotBot can fly closely along the water. When a whale surfaces and blows, the drone automatically moves into position and collects its bounty. It then returns to the research boat to drop off its treasured samples before immediately going back out. The drone can find its way back to the research boat even when it is half a mile away. This means that scientists no longer have to chase in their noisy boats after whales. The SnotBot can do all the collecting while the whales are left in peace.

Your Name: _____ Partner: _____

Sampling Snot (cont.)

First Silently read "Sampling Snot." You might see words you do not know. It is likely there will be parts you do not understand. Keep reading! Determine what the story is mainly about.

Then Sum up the story. Write the main idea and most important information. If someone reads your summary, that person should know it is this story you are writing about.

After That Read the story again. Use a pencil to circle or mark words you don't know. Note places that confuse you. Underline the main action or idea of each paragraph.

Next Meet with your partner. Help each other find these words in the text.

massive specimen obtain initial bounty

Read the sentences around the words. Think about how they fit in the whole story. Discuss how the author helped you know what the words meant. Then pick one word each. Make sure you each choose a different word. Fill in the blanks.

a. My partner's word: _____

My partner thinks that in this passage, the word must mean _____

I agree because in the passage, _____

b. My word: _____

I think that in this passage, this word must mean _____

My partner agrees because in the passage, _____

Your Name: _____

Sampling Snot *(cont.)*

Now Answer the story questions below.

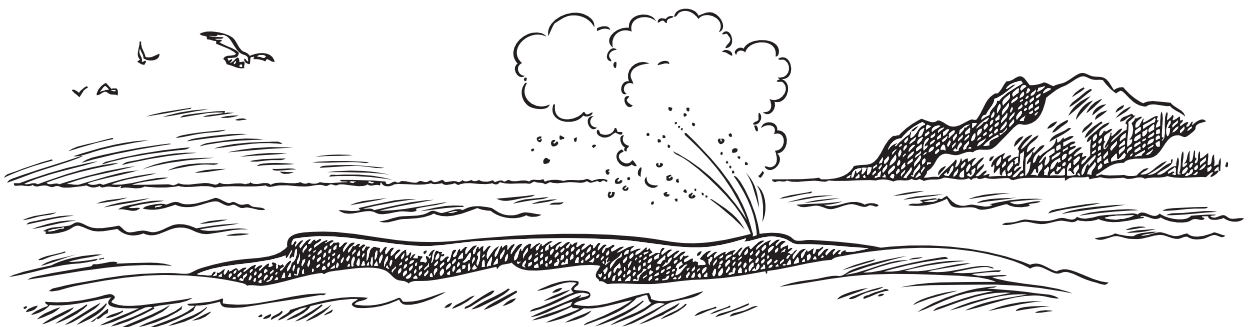
1. What are scientists using whale snot for? Give specific examples from the text.

2. What advantages does the SnotBot have over a pole or a toy helicopter?

3. In paragraph 5, it says that poles and toy helicopters are "old hat." What does this expression mean in the way it is used here?

How does the story help you know? _____

4. Are all whale types equally comfortable around people? Defend your answer using evidence from the text.



Your Name: _____

Sampling Snot (cont.)

Then

Reread the entire story one last time. As you read, think about how information about Karina is spread throughout the story.

5. Analyze the seven sentences in paragraph 1. Why do you think the author wrote each part of paragraph 1 in the way she did? What is the author’s purpose for the following:

a. the first sentence by itself? _____

b. the first five sentences together? _____

c. the sixth sentence? _____

d. the seventh (last) sentence? _____

6. In which other paragraphs is Karina mentioned? Check each box that applies.

2

3

4

5

Did weaving in the story of an actual scientist help you understand how science works? Explain.

7. Why is paragraph 2 important? What purpose does this paragraph serve in the story?

Why is paragraph 5 important? What purpose does this paragraph serve in the story?

Learn More

Draw a picture of what you think the SnotBot drone might look like. Then compare your picture to what can be seen on the Internet.

“Buried Alive” (pages 8–11)

Summary: A blizzard strikes, and a man has to bury himself in the snow to stay alive. After a long night, he is saved when he runs to what he hopes is the sound of a friend.

1. He was trying to simulate the conditions of a blinding blizzard.
2. It is probably not because we are told that the expedition was almost over (16 miles to go out of 3,725) and that blizzards strike often.
3. “fraught with danger” = “full of danger or unpleasantness”; “strike fast and furiously” = “happen very rapidly and with unrestrained energy”
4. He trusts that they will be out looking for him. Student illustrations should show five people tied together with a long rope.
5. Funatsu, as well as other scientists and explorers, practice over and over walking around with buckets on their heads to obscure their vision.

“Case Solved” (pages 12–15)

Summary: Ava and Ethan read a lot and use their knowledge to solve mysteries. Ava’s knowledge of England and Ethan’s understanding of cartography help them.

1. Rodney said the map was 150 years old. The X was below the *n* in *Iran*, but the country wasn’t called Iran until 1935.
2. The steering wheels are on opposite sides. Student illustrations should show a driver on the right side of car in “England” box and one on left side of car in “United States” box.
3. She is being taken advantage of; her new “friend” is trying to cheat her by getting her to pay cash for a tour that does not exist.
4. The novel set in modern-day England; automobiles had not yet been invented in the 14th century, so there would be no mention of steering wheels.
5. Reading fiction and nonfiction can be interesting. Information one reads may help one solve cases or help people in real life; two cases are solved due to information in the current books being read.
7. Children in England are taught to look “right, left, right,” because as Ava points out, the English drive on the opposite side of the road.

“Bark Ranger” (pages 16–19)

Summary: Bark Rangers are dogs trained to keep wildlife away from people in parks. They have helped to protect goats and to keep aggressive deer away from people.

Vocabulary: a. canines; b. frantically; c. distraught; d. congregating; e. bleated

1. mother = nanny or doe; baby = kid
2. They were licking up antifreeze from cars and eating trash people had left; the antifreeze was poisonous, and the trash could make them dependent on people.
3. To “lend a hand” is to help out, and dogs have paws instead of hands; the dogs are helping the park rangers keep wild animals away from people.
4. Yes, they cleared the parking lot better than when the rangers waved bags or shot empty shells into the air. They reduced the number of incidents from 40 to four when it came to aggressive deer. They helped rangers educate visitors, because the rangers could talk to the visitors when they came to pet the dogs.
5. paragraph 2
6. once or twice a week; they didn’t want the goats to get used to Gracie like they got used to the people and cars.
7. The author gives background information, uses statistics (numbers), and provides quotes from experts.

“Updated Fairy Tale” (pages 20–23)

Summary: Students sum up a fairy tale in which a vain emperor is tricked into lying about seeing clothes that do not exist. The other characters go along so that he doesn’t think badly of them. Only a little boy cries out that the emperor has no clothes.

Vocabulary: a. False; b. True; c. False; d. True; e. False

1. It can’t be seen by those who are stupid, incompetent, or unfit for their positions.
2. There was no suit; no, because a good advisor would have bravely told the truth.
3. It means one is vain or self-centered; in the story, the emperor is vain, and all he cares about are his clothes.
4. She says their T-shirts are identical; they’re the same size, color, and material.
5. One girl is teased because her T-shirt costs less than another girl’s. Some students say they will cheer her up with the story “The Emperor’s New Clothes.”
6. It deals with modern issues such as teasing in schools and paying high prices for designer-label clothes.

“Eaten!” (pages 24–27)

Summary: Famous author and illustrator Maurice Sendak makes a drawing for a child fan, who then eats it. Sendak takes it as a compliment.

Vocabulary: *hastily* = “quickly”; *lingered* = “took his time”; *recounted* = “said what happened”; *compassionate* = “kind and caring”; *rollicking* = “very lively and amusing”

1. The sick lion mutters that he doesn’t care, just like Pierre always does.
2. He did not, because otherwise he would not have spent so much time drawing it.
3. It is worth a lot; if a king were taken, one would have to pay a lot to get him back; it has to be worth a lot or else it wouldn’t have mattered if he had eaten it.
4. It does not, because Sendak “could never end a tale on such a gruesome note.” Illustrations might show the lion lying sick in bed and the lion visiting the doctor.
5. paragraph 2; yes, because most people have read or know about the book *Where the Wild Things Are*.
6. The drawing is eaten, Pierre is eaten, and though a minor detail, Max is sent to bed without eating; the title *Max* only focuses on a minor detail in the story.
7. Yes, because you would have known who the author was.

“Why Day” (pages 28–31)

Summary: A teacher confuses her students by giving them answers to questions. She matches one question to its answer, while the students match the others.

1. It will land on its feet; cat’s lack a collarbone and have a very flexible spine, allowing them to twist, turn, and rotate so they can position themselves to land.
2. They run clockwise; Whitley had horses run the opposite of the way they did in Britain, and Whitley’s horses ran counterclockwise.
3. They mean “get back to work” and “start thinking critically”; Ms. Trivia says the students must match answers to questions, as she did the first for them.
4. The smell comes from bacteria that feed on the sweat. Sweaty hands dry faster. Sweat doesn’t evaporate on feet as quickly, especially feet in socks or shoes.
5. paragraph 2; she says, “I just answered four ‘Why?’ questions.”
7. Even though it contains true facts, the story is fiction, because the teacher and her students are made up.

“Sampling Snot” (pages 32–35)

Summary: A scientist thought of using whale snot to find out about what is living in whale’s lungs. Various methods are used to collect whale snot.

Vocabulary: *massive* = “huge”; *obtain* = “get”; *specimen* = “sample”; *initial* = “first”; *bounty* = “reward, a good thing to get”

1. They’re using it to check what grows inside a whale’s lungs (fungi, bacteria, viruses) and to analyze DNA, microbiomes, and hormones.
2. It can be used a half a mile away from the research boat, so there is no stress to the whale; it moves quickly and works automatically.
3. It means “not new, outdated”; after saying that is what the pole and the toy helicopter are, the story describes a much fancier and more advanced drone.

- No, because it says that with shy, blue whales, Katrina had to use the helicopter. It says grey and sperm whales are more comfortable being close to boats.
- Paragraphs 3 and 4 should be checked.
- Paragraph 2 helps readers understand why getting the snot sample is so important; paragraph 5 gives readers a sense of how far science has progressed.

“Fair Swap?” (pages 36–39)

Summary: Janelle has traded her new shoes for a magic lamp and three wishes. She wishes for new shoes, a diamond, and an interview with Abe Lincoln. Her wishes come true, but not in the way she expects.

- Students should draw a pair of new shoes, a diamond, and a picture of Lincoln.
- It is set up like a baseball diamond; Young-Su asks her about it when he returns the shoes; she didn’t know, because in the next line she says she doesn’t like the way her wishes are turning out.
- It means “to be nervously waiting to see what is going to happen”; Kyle speaks nervously, and he says he will feel this way until he finds out who is at the door.
- She does not, because she could easily look up information about Lincoln. Despite that, she would give up one of only three wishes to talk to him.
- Janelle:* a girl who gets wishes; *Kyle, Duane, and Young-su:* friends of Janelle; *man at door:* man dressed like Lincoln; *setting:* Janelle’s house, present time.

“King of Sting” (pages 40–43)

Summary: An entomologist developed a pain scale to rank insect stings. Two types of ant are discussed, along with information about the entomologist.

Vocabulary: *embedded* = “stuck in”; *entomologist* = “one who studies insects”; *forage* = “look for, gather”; *slugard* = “slow-moving creature”; *potent* = “powerful”

- He allowed himself to be stung 2,500 times by various stinging insects; pain is ranked from 1–4, with “4” being the most painful.
- No, because Schmidt is an entomologist, and we are told he studies insects; no, we are told Schmidt focuses on ants, wasps, and bees.
- Each person has his or her own opinion about something; some people may say that Schmidt is crazy, but he thinks he’s just doing what he likes.
- “One will start sweating, and the hair on one’s arm will stand up like the hair on the back of a frightened dog’s neck.”
- We don’t yet understand everything about insect venom and its complex biochemistry. Perhaps it can affect our nervous systems in good ways.
- The harvester ant’s venom is 40 times more potent than that of a Western Diamondback Rattlesnake.

“Good Luck Bat” (pages 44–47)

Summary: A girl always strikes out, but then her uncle gives her a bat he says has powers. She becomes a great hitter, which she thinks is all because of the bat. Her uncle tells her the bat is ordinary. The next time up, she strikes out.

Vocabulary: *dejected* = “sad”; *listlessly* = “without energy”; *stowing* = “packing, putting away”; *purchased* = “bought”; *ultimate* = “last”

- At the beginning, she strikes out all the time. Then she hits all the time with her uncle’s bat. When she finds out the bat isn’t special, she misses again.
- Her uncle told her that a sorcerer said it had special powers, and she knew her uncle went deep into the Amazon jungle where there might be special trees.
- a. Something amazes or surprises you. Samantha’s uncle is amazed and surprised at how well she is hitting; b. We know the uncle does not literally mean that his socks have been blown off of his feet by how well she is hitting.
- She struck out in the ultimate game even when she swung mightily and hard.
- paragraph 4; he thought it was a matter of confidence, and now that she had proved that she was a good hitter, she didn’t need it.

- a. realistic fiction; b. magical realism

“Blubber How-To” (pages 48–51)

Summary: Blubber is a layer of fat that insulates animals from the cold and can also store energy. By conducting an experiment, one can see how blubber acts as insulation.

Vocabulary: *insulation* = “protective layer”; *frigid* = “icy cold”; *dual* = “two-fold, two”; *scarce* = “in short supply”; *conduct* = “perform, do”

- It serves two purposes: as insulation against the cold and as stored energy.
- The one in the plastic bags with the vegetable shortening; the vegetable shortening is an insulating layer of fat, like blubber.
- It means that although an action may seem crazy, there is a reason behind it; it says it may seem crazy, but you find out why you turn the bag inside out later.
- Students should shade in the box up to the 3/9 (or 1/3) mark; if the bag is too full, the shortening would spill out the top when you try to put the other bag and your hand in.
- The title is unclear, there is too much information, and the steps are not numbered or clear enough; only paragraphs 3, 4, and 5

“Banner in the Sky” (pages 52–55)

Summary: A boy visits his grandfather and is angry at the lack of technology. He ends up liking one of his grandfather’s books, which is about a boy who saves a climber.

Vocabulary: a. crevasse; b. tedious; c. flabbergasted; d. agony; e. aggravated

- It will take too long, and the man will freeze to death before he gets back.
- At first he thinks it is going to be of no interest because it is so old (1954, yellow pages), but then he gets really interested and doesn’t want to stop reading it.
- He is very angry; the boy is upset at being given a book to read instead of being able to do something on a computer, television, tablet, or smartphone.
- It took a lot of strength to hold him and a lot of courage to try to save him.
- It is called *Banner in the Sky* by James Ramsey Ullman, it was published in 1954, and the copy the boy is reading has yellowed pages and a torn cover; no, it could be anything: an original story, a news article, a dream, etc.
- It was written in 1954, and he didn’t think a book that old could be of any interest for him.

“Driverless Cars” (pages 56–59)

Summary: The author defends driverless cars. Most accidents are due to driver error, and we have the technology to change that. We shouldn’t be afraid of change.

Vocabulary: *prone* = “likely to”; *hazardous* = “dangerous”; *innovation* = “modern improvement, change”; *novelty* = “new thing”; *eliminate* = “get rid of”

- High wheelers: huge front wheel, small back one; safety: same-size wheels
- Most accidents are due to driver error; she thinks they will reduce driver error.
- If you really need something, you will invent it or find a way to get it; driverless cars are needed to reduce driver error, and we can do it with new technology.
- People being afraid of change; we must embrace change, not fear it.
- Paragraph 1 is mainly about people’s fears in regard to the new safety bicycle; the author’s purpose is to show that we should not be afraid of innovation.
- Rhetorical question: “Why then did I mention people’s objections to safer bicycles?”; answer: an opinion

“First Contact” (pages 60–63)

Summary: An anthropologist who studies isolated tribes gets lost on a reserve. The tribe forces him back to their camp.

Vocabulary: a. T; b. F; c. T; d. F; e. F