

The Cofounding Case of the Climate Crisis by Owen R. Liu

Discussion Questions

ELA focus questions have answers in **red**. Science focus questions have answers in **green**.

Chapters 1 & 2:

Vocab: pg 3: exertion pg 12: bristle pg 13: incredulity, fraudulent science pg 18: conspiracy

1. What are 2-character traits of the main characters, Anita and Benson? What evidence from the story shows these traits?
 - Anita- smart (knew about how a greenhouse works), funny (threw tomatoes and joked with Benson), has black hair
 - Benson- curious (goes to look at back door instead of following teacher directions), prankster (throws tomatoes at Anita), bold (doesn't raise his hand to answer questions)
2. On page 4 the author describes their teacher, Mr. Fazmel, as having potential for fury. What does this tell us about him?
 - He has a bad temper
3. At the end of chapter 1 we meet the other greenhouse worker who Anita and Benson found at the back door. Make a prediction for how this character may be important in the story.
 - Answers will vary
4. Before showing students the picture of Quarkum on page 16, have them draw a sketch of what they think he looks like and share with a neighbor or other classmate.
 - bright blue hair and blue and grey jumpsuit from the future
5. Who is Quarkum and what mission did he give Anita and Benson to solve?
 - Quarkum is from the future and is a member of the secret society G.A.S.- Galactic Academy of Science. He recruited Anita and Benson on a previous field trip to help solve science related problems. He gives them their missions and their X-PA device that allows them to time travel and investigate. Their current mission is to find out the truth about global climate change.
6. How does a greenhouse allow plants to grow in the winter?
 - Sunlight enters the greenhouse and the glass traps the warmth of the sun which warms the plants and the soil around it. The plants release water vapor which is also trapped by the glass. This also helps warm the trapped air.

Chapters 3 & 4:

Vocabulary: pg 22: plummeted, raptly pg 25: sheepishly pg 31: waver pg 35: desolate pg 42: long term indicators pg 43: astutely, bias

1. Anita and Benson travel back in time to the year 1860. Who do they visit and what information do they learn that could be helpful in solving their mission? (pg 32)

- They visit Dr. John Tyndall, a professor who is studying radiant heat absorption by gases. His experiment shows that the radiant heat from the sun is captured by gases (CO₂) which is why the planet stays warm and isn't just a cold block of ice. The CO₂ and other gases act like a blanket keeping the heat trapped.
2. What are two important skills or traits Anita and Benson have that help them time travel and introduce themselves to strangers to learn and solve their mission.
 - Anita and Benson aren't scared to introduce themselves to the scientists. They ask a lot of questions to learn as much as they can. They are curious and are always thinking about what they learn and how it can help solve their mission.
 3. Dr. Keeling and his team are studying long term indicators to learn how the atmosphere changes over time. What do Anita and Benson notice about the ten-year graph of carbon dioxide? Pg 42
 - **The trend shows it is jagged but definitely rising.**
 4. What is the hypothesis for the jagged carbon dioxide line and the dip in the line every June?
 - **Across the Northern Hemisphere, plants begin to grow taking in carbon dioxide in the process of photosynthesis, so there is less CO₂ in the atmosphere.**
 5. Why does burning fossil fuels, like coal and petroleum (oil), contribute to more carbon dioxide in the atmosphere?
 - **Fossil fuels come from ancient plants that died and were buried. They contain carbon because they took in carbon dioxide during photosynthesis to grow. When we burn them for energy, they combine with the oxygen in the air to form carbon dioxide. That increases the amount in the atmosphere.**
 6. Page 47 has a simile about the staff at the top of the mountain as they rush to prepare for the volcanic eruption: "The bustling staff of the observatory rushed around, looking to Benson like ants whose nest has been disturbed." Create your own simile to describe this situation.
 - Answers will vary examples: The staff of the observatory were like cars in a traffic jam in New York city, rushing about to keep the observatory from being ruined.

Chapters 5 & 6:

Vocab: pg 52: indistinct pg 57: translucent pg 70: whirlwind pg 74: bogus pg 75: doggedly pg 79: surreptitiously

1. Why was Dr. Dansgaard not surprised to see Anita and Benson? Who did he think they were?
 - He thought they were Lucas' assistants who had arrived early.
2. At the bottom of page 56, Dr. Dansgaard talks about his ice core project. How does the author tell us that he is passionate about his work without directly saying this?
 - The author uses descriptive language so we can picture his passion. An example from the text is: "He looked like a child preparing to touch his favorite toy"
3. How is the ice core sample from Greenland like the rings on a tree?
 - **The rings on a tree represent yearly growth. The layers in the ice core sample represent the yearly snow and the differences between each year.**
4. Why did Dr. Washington wince when the reporter uses the phrase, "believe in climate change"?
 - Answers may vary but this shows that Dr. Washington doesn't think climate change is a belief, rather it is a scientific fact that should not be ignored.

5. Dr. Washington is a climate modeler. How does his research differ from “predicting the future”?
 - **Dr. Washington’s work is based on many different types of data over a long period time in different places all over the world. A model puts all this together and studies the trends and relationships. They then figure out what is likely to happen if trends continue.**
6. In chapter 6 Anita and Benson start to pull all their scientific evidence together to analyze the effects of climate change. What part of the scientific method does this chapter relate to and why?
 - **Anita and Benson are beginning to analyze their data which is the second to last step in the scientific method. After analyzing data, they would draw conclusions and in their case form actions to combat climate change.**

Chapters 7 & 8

Vocab: pg 84: river delta pg 86: scorn pg 99: shamba pg 100: thatched pg 110: lithe

1. Explain two types of conflict in chapter 7 (man vs nature, man vs man, man vs self)
 - **Answers may vary, examples include: Man vs nature- Anita and Rifat have a close encounter with an crocodile while planting floating gardens**
 - **Man vs man- Rifat feels anger and resentment towards Anita and Benson who represent modernized countries like America who are burning fossil fuels and contributing to climate change which directly impacts his community and life**
2. What is the connection between burning fossil fuels and flooding in countries like Bangladesh?
 - **Burning fossil fuels release carbon dioxide which makes the atmosphere hold more heat. Global warming makes the ice caps and glaciers melt adding water to the oceans. Warm water expands meaning higher water and more flooding. Warmer temperatures also mean more evaporation and bigger storms.**
3. What are solutions Rifat, Hasan and his community have developed to combat rising waters and climate change in Bangladesh?
 - **Pg 95- built tube wells to get fresh water**
 - **Pg 85 & 87 make floating vegetable gardens**
 - **Pg 85- build their houses on stilts, hold school on boats**
4. How does a riparian zone help protect a village? Can you think of an area where you live that may be described as a “riparian area”?
 - **Planting trees along the river provides shade and cools the air and water. The roots of the trees stabilize the soil and prevent or decrease erosion during a flood.**
 - **Answers will vary**
5. How are Anita and Benson similar and different to Grace and her family in Kenya?
 - **Same: both enjoy going to school, playing, being with family**
 - **Different: eating (no utensils), clothing (women wear dresses), Grace can only go to school when there isn’t harvesting or work to be done, their lives revolve around drought and managing effects of climate change**

Chapters 9 & 10

Vocab: pg 120: commerce pg 129: resilient pg 132: adobe pg 133: acrid pg 141: berate pg 149: indignation pg 155: arrogant

1. Anita is nervous to go snorkeling but faces her fears and ends up learning a lot. Describe a time when you faced a fear and how did you feel afterwards?
 - Answers will vary
2. Explain why oceans are becoming more acidic?
 - Oceans absorb about half of the carbon dioxide pumped into the air from burning fossil fuels making them more acidic.
3. Lianna took Anita and Benson to an area where there was a large amount of coral bleaching. What is the cause?
 - There are many stressors including warmer water, over-fishing (like removing the parrot fish), pollution and ocean acidification.
4. Benson feels like climate change is an enormous and overwhelming problem. What do you do when you have a BIG problem to solve?
 - Answers will vary: break it down and take it step by step
5. Explain why Anthony tells Skinny's mother that, "he must fill you with pride and fear". What are two words your parents would use to describe you?
 - Skinny cares for every living creature and was willing to risk his life to rescue No Tail, the dog but this bravery also makes his parents fearful for his safety
6. According to Benson putting all the clues together, what wildfires have to do with climate change?
 - There is more heat, drier weather, drying streams, and less moisture. Dry storms with lightning but no rain may start fires.

Chapter 11

Vocab: pg 163: foe pg 170: inexorably

1. Why do you think Anita and Benson's classmates were willing to help them against Jon (the greasy man)?
 - Answer may vary: Anita and Benson stood up for what they believed was right and based on their scientific learning. They were educated on the facts and it was easy to see Jon was just an angry man who had been fired from his job with no evidence to his claims about climate change
2. Page 173: After the conflict with Jon (the greasy man) the author states that Mr. Fazzmel spoke as if he approved of the ends, but perhaps not the means. What does this mean?
 - Mr. Fazzmel is thankful that Anita and Benson saved he and Tiffany and discovered that Jon was an angry, resentful person. However, Anita breaking into the car to discover the letter and starting a vegetable fight has caused a mess that he would have preferred not to happen. He is happy with how the situation ended but not exactly with how the students got there.

Conclusion: Climate change is a complicated issue. Benson and Anita researched how we know it is happening and what are some of the problems. But what can YOU do about it? Now you have an opportunity to be part of the Galactic Academy of Science and contribute by completing this mission.

Student Extended Response Question: Quarkum suddenly appears in front of you with an X-PA. He gives you a mission and the device. Go 10 years into the future and discover ways that people like you have slowed down or stopped global warming. You may travel to different places to gather information. Include a list of those locations and what you have found. He states, "The world is waiting for your report."

Possible scientists to research if student was interested: Mary Anning, Charles Darwin, John Tyndall, Charles Keeling, Dr. Willi Dansgaard, Dr. Warren Washington