

The Bends! Scene 1

Jamal had been looking forward to this trip for a long time. He had always wanted to try SCUBA diving, and now, as he swam slowly through the coral reef, looking at brightly colored fishes and gently swaying plants, he was incredibly excited. He looked over at his cousin Trey, who was reaching out to touch the surface of the coral reef. Trey was the same age as Jamal, which meant they'd both just turned eighteen. Jamal looked over at him and waved. Trey looked almost like an eel, in his slick black wetsuit and flippers, and a steady stream of bubbles rose up from his mouthpiece. Jamal was wearing the same kind of suit, and each of the boys had two tanks strapped to their backs.

Jamal looked at his watch and saw that it was almost time to go back up to the surface. That was good, because he was getting hungry. He motioned to Trey and pointed up, towards the surface. Trey nodded and kicked his flippers hard, heading fast for the surface. Jamal hesitated. He remembered the instructor telling them to go very slowly back to the surface, something about gases in their blood and pressure. He didn't really remember the details, but just in case, he kicked very slowly to the surface.

Trey had already taken off his tanks and mask when Jamal finally got to the surface. He looked at Jamal and grinned. "Hey man, what took you so long?"

Jamal replied, "I was just doing what the instructor had told us during our lesson. Come on, you hungry? I want lunch, I'm starving."

The Bends! Scene 2

Jamal put down his drink and leaned across the table, whispering, “Trey, what’s the matter with you? You’re making a mess of your food. You’re embarrassing me, man!”

Jamal and Trey had gone back to Trey’s house and showered, changed into shorts and T-shirts, and walked down the street to a little sandwich shop for some food. The place had been really crowded; they’d had to wait almost an hour for a table! Now, as Jamal ate his sandwich, he noticed Trey was moving his arms funny, almost like he couldn’t bend his elbows. “Trey, are you all right?”

Trey replied, “I don’t know, man, my head hurts and my arm feels kind of numb.” He started scratching his chest. “Plus my chest itches like crazy!” He pushed his food away. “I can’t eat this, Jamal, I feel sick and my whole body’s starting to hurt, especially my joints. Can we go back to my house for a little bit?”

Jamal helped Trey out of his chair. Jamal suddenly remembered something else that his SCUBA instructor had said, and had a feeling he might know what was wrong with his cousin. “Come on, Trey, I’ll pay for our food, but then we’re going straight to the hospital.”

The Bends! Scene 3

Trey's mother clasped her hands together with worry and said, "Trey has the bends? But I thought the boys took a SCUBA class before they went diving. They teach you all about the bends!"

Jamal sat next to her in the waiting room of the hospital. "We did take the class, and they told us all about it, but I guess Trey didn't listen well enough. I even thought it was kind of confusing."

The doctor nodded. "Boyle's Law can be confusing to learn, but it's really important to activities like SCUBA diving. Not paying attention to the instructor caused your cousin a lot of problems. Jamal, are you feeling all right? You were down there with Trey, too."

Jamal nodded. "I feel fine. I surfaced very slowly, like the instructor told us to."

The doctor said, "Well, it's a good thing you did, because if you hadn't, you'd be in bad shape, like your cousin."

Suddenly a man walked into the room and said to Jamal's mother, "Mrs. Smith, I'm Jamal and Trey's SCUBA instructor. I hate to bother you while your son is in the hospital, but Trey owes me \$640 because his air tank burst twenty minutes ago."

Jamal's aunt sat stood up and said, "What?! How could Trey have blown up his air tanks if he finished SCUBA diving over three hours ago?"

The SCUBA instructor replied, "Trey didn't have to be at the pier to burst the tank himself. Jamal and Trey were supposed to return their tanks to the shed on the docks after they had them refilled. When they finished at noon, Jamal put his tank back in the shed, but Trey left his tank on the dock in the sun when the temperature was 77 degrees Fahrenheit. Three hours later, the sun had heated the compressed air in the tank to 122 degrees."

Jamal slapped his forehead. "Aww, Man! Trey ignored another gas law!"

The Bends! Case Evaluation

Your group has the opportunity to make a poster about the Bends and how they are related to the Gas Laws and gas behavior. This poster can be as colorful, artistic and beautiful as you want, and you can bring markers, crayons and color pencils from home if you'd like.

HOWEVER, each group's poster must include all of these things:

- ***Describe*** the Bends and its symptoms
- ***Explain*** what **exactly** causes the Bends. You may include risky behavior (for example, swimming to the surface too fast), but you **MUST** explain **how** **gases, pressure and solubility** cause the Bends.
- ***Explain*** what caused Trey's air tanks to burst after they'd been refilled. You may include Trey's mistake (leaving it out in the sun for several hours), but you **MUST** explain **how** **gases, temperature and pressure** caused it to burst.
- ***Define*** Boyle's and Charles's Laws and describe which law explains why Trey got the Bends and which law explains why Trey's tanks burst.
- ***Graph*** the data from the two tables that Ms. Shamsid-Deen and Ms. Turner give your group, using the paper pictures as points. You must have two graphs: One for Boyle's Law, one for Charles' Law.
- ***List*** the books, websites and any other sources that you read or studied that helped you solve the case and put together the poster.

Your group should divide think about what you need to do to complete this poster and work as a team to include everything in the list above. Your group may divide up the research that still needs to be done, **but you must work on the poster together!**

The Bends! Box Chart

<p><u>Facts</u> (What we know right now)</p>	<p><u>Questions</u> (Based on current knowledge)</p>
<p><u>Hypotheses</u> (Based on facts and questions)</p>	<p><u>Learning Issues</u> (What we need to learn)</p>

The Bends! Case Evaluation

Date _____

Your Name _____ Group # _____

Name of Case _____

Please circle the response with which you agree the most. This evaluation will only be read by [**Teacher and/or Facilitators**], & will not be shown to other students.

a. How would you rate *your* participation in group discussion and group work?

5 Excellent **4 Very Good** **3 Good** **2 Fair** **1 Poor**

b. How would you rate *your* effort in completing the case?

5 Excellent **4 Very Good** **3 Good** **2 Fair** **1 Poor**

c. Did *you* complete the assigned homework? **Yes** **No**

If No, explain why:

d. How well did *you* work with everyone in your group?

5 Excellent **4 Very Good** **3 Good** **2 Fair** **1 Poor**

e. Overall, how would you rate *your* performance in this case?

5 Excellent **4 Very Good** **3 Good** **2 Fair** **1 Poor**

Comments (praise/criticism for other group members, your thoughts about the case):
