

Create a Problem 1

Name _____



Ted knew lots of strange facts and loved to quote them to his mother and father. Ted's mother liked to say he was full of hot air. Ted looked in a biology textbook and learned the air going into his mouth and nose can be almost any temperature, but it always comes out at about 37 degrees Celsius.

(Ted converted that temperature to Fahrenheit so his mother would understand.)

Ted discovered that a person's lungs contain 2-4 liters of air. If he breathed harder and deeper he could hold more air, but not as much as his mother and father, because they had larger lungs. He told his mother she was more full of hot air than he was. He thought that was funny, but his mother didn't agree.

Ted discovered that his nose helps to filter air, and his lungs take oxygen out of the air and pass it to the blood. At this point he stopped reading and got ready to go camping for the weekend.



As he put his air mattress into the trunk, he wondered how many breaths it would take to inflate it. The air mattress had a tiny label that said 150 liters. Ted counted his breaths and learned he breathed about 25 times per minute. This made him tired, so he yawned and fell asleep in the back of the car.

HELPFUL HINTS and NOTES

Temperature Conversion

$$^{\circ}\frac{9}{5}C + 32 = \text{ } ^{\circ}F$$

Lung capacity _____

Exhaled air temperature _____

What temperature (degrees Fahrenheit) is the air when it comes out of Ted's mouth?

Estimate the range of breaths Ted might use to blow up his 150 liter air mattress:

Estimate how many minutes it will take Ted to inflate the air mattress:

Ted told his mother that sometimes he is full of hot air, but other times he is not. When was the air coming out of Ted least likely to seem hot?

Ted told his mother that sometimes he is full of hot air, but other times he is not. When was the air coming out of Ted least likely to seem hot?

Write your own problem based on Ted's study of hot air (and solve it).
