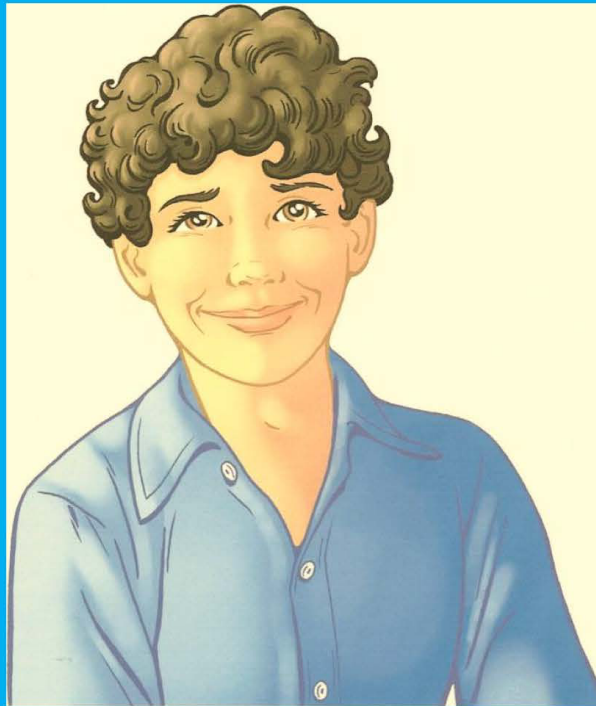


THE BARTON SERIES

OUR FRIEND BARTON



BY

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(Ages 8 and over)

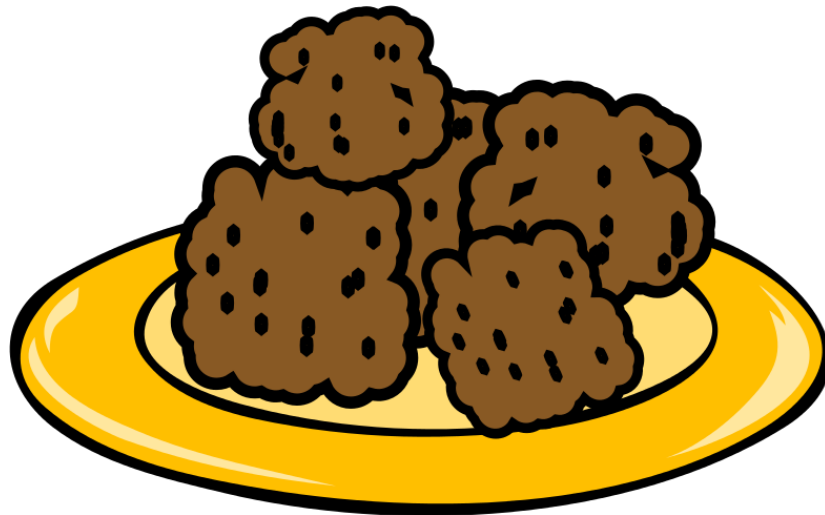
OUR FRIEND BARTON

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WALKING BACKWARDS

Barton, Dane, and Alfredo sat together on a couch at Shanna's home and chatted among themselves. They were waiting for dozens of freshly baked ginger cookies to cool. For the past several weeks, Shanna, Sian, and Malaika would bake different types of cookies on a Saturday afternoon. The girls were learning and improving their baking skills, under the guidance of Shanna's mother.



The boys were sometimes designated related duties, such as purchasing items from the supermarket, washing the used dishes and even helping with the mixing of the batter. The latter was looked upon with great favour, for there were special 'fringe benefits' associated with this job.

The seven friends would gather at Shanna's home for this enjoyable event. And, after baking, all would crunch happily, as they enjoyed the fruits of their labour.

Today, Kwame seemed rather uneasy. First, the amicable boy was promised, more than his usual share of cookies and he was famished. When it came to eating, Kwame's internal clock could announce, with uncanny accuracy, the mealtime hours of breakfast, lunch, tea, and dinner. The smell that emanated from the kitchen did little to quell the plump boy's thoughts of sinking his teeth and savouring the taste of fresh, ginger cookies. More so, with three shares to himself, his great appetite would be temporarily appeased.

Secondly, the baking temperature required for the cookies was stated only in degrees Celsius. Shanna's oven was calibrated in degrees Fahrenheit. It required Kwame's skill in converting the necessary baking temperature, from 350 degrees Centigrade to its equivalent of 662 degrees Fahrenheit.

Though Kwame was certain of the methodology employed, any deviation from savoury, mouthwatering cookies may perhaps be blamed upon a faulty conversion formula. The result would be a small dent in his academic reputation, but more so, an alarming decline in his share of cookies.

Both these thoughts, though different as the Sahara is to the Arctic, meandered menacingly in his head. Also, a third share was bartered to Kwame, if he would explain how the formula was derived. Kwame's promises were considered sanctimonious and he promised to do so after the girls had kept their side of the bargain.

Fate, however, was on the side of the bakers. The temperature conversion from 350°C to 662°F, done by Kwame was indeed sound. The girls had followed the recipe with great detail and expectancy, and all four dozen ginger cookies were baked to a delicious golden brown hue. Promises made were kept to the plump one, for the sharing of the delicacies. The only event that seemed more enjoyable than the taste of the ginger cookies was the comical view of Kwame's munching, as he conveyed food from one part of his body to another.

Then, as the last crumb disappeared off the receptacle, all were content. Kwame, in particular, possessed a look of deep satisfaction.

"Now that I am fuelled," he said, "I am ready to keep my side of the bargain."

The dishes used were all clean and the kitchen at Shanna's home was left in its usual clean and tidy form. All thanked Shanna's mother for her generosity and hospitality before leaving.



“Let us all ride to the treehouse,” suggested Kwame.

And so the seven friends hopped on their bicycles and rode off in the direction of Barton’s treehouse. The distance was just about two kilometres, and apart from stopping to look at the ducks swimming about in the nearby pond, the journey was relatively uneventful.

Kwame, for obvious reason, had slightly more difficulty in climbing the ladder that permitted entry into the comfortable treehouse. Panting slightly, he finally emerged through the doorway and settled in before his six anxious students. Each had a notebook and pencil and was ready to enjoy the lesson from their tutor.

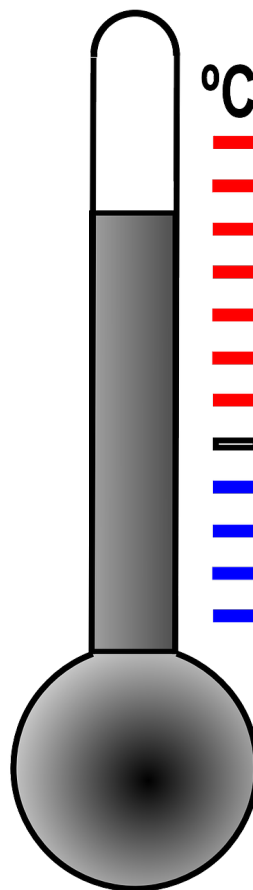
“My dear students,” started Kwame, “I would like us to recall a few simple facts concerning the measurement of temperature.”

“Shanna,” said Kwame, pointing to the surprised pupil, “I would like you to briefly remind us about what we learned on the measurement of temperature?”

Shanna, though taken aback slightly, decided to stand as she spoke. Kwame looked directly at her and so did the other five. This lesson has certainly started as one of our lessons at school, they thought.

“Shanna, enjoying the moment, spoke.

“Temperature, which is the measure of heat, is measured by an instrument called a thermometer,” she began. “It consists of a liquid-filled tube, set against a graduated scale. The liquid used is sometimes alcohol or sometimes mercury.”



“Wonderful,” commented Kwame, “please continue, my dear student.”

“The scale can be different in thermometers,” added Shanna. “Some thermometers are graduated to measure temperature in degrees Celsius, whilst others are graduated to measure temperature in degrees Fahrenheit. Since the scales are different, the same temperature has a different measure or reading in degrees Celsius to its measure in degrees Fahrenheit. However,

there is a special formula that enables one to convert a temperature reading from degrees Celsius into degrees Fahrenheit. The formula states that $F = \left(\frac{9}{5} \times C\right) + 32$, where C is the temperature in degrees Celsius and F is the temperature in degrees Fahrenheit.”

There was applause from six pairs of hands as Shanna proudly concluded.

“That is, ‘par excellence’,” said Dane, as the rest agreed.

Kwame drew a scale on the small whiteboard and began his explanation.

“The scientist Anders Celsius, with his thermometer, decided to use the temperature of frozen water as his lower scale and which he numbered as zero and the temperature of boiling water as his upper scale,” spoke Kwame.

Kwame wrote ‘0’ at the bottom of the scale and ‘100’ at the top of the scale of his diagram.

“The space between these marks of 0 and 100 are divided into 100 equal parts, each one representing one degree Celsius,” he explained.

The children seemed to all understand and could be seen jotting notes as they listened to their learned friend.

“Another scientist, Daniel Fahrenheit, also decided to use the freezing point and the boiling point of water as the lower and upper ends of his scale,” stated Kwame, as he drew another scale at the side of the Celsius scale.

All eyes were focused on Kwame as his voice dropped.

“My friends,” said Kwame, sounding rather mysterious, “Daniel Gabriel Fahrenheit, discovered that when salt was added to water, it freezes at a temperature that is even lower than the temperature of pure, frozen water. And so, this is what he used as the lower point on the Fahrenheit scale and which he marked as zero degrees.”

“Therefore zero degrees on the Fahrenheit scale, is a lower temperature than zero degrees on the Celsius scale,” said Barton, speaking slowly as he digested the new realisation.

“That is because the freezing point of brine, which is water to which salt is added, is lower than the freezing point of pure water,” echoed Sian.

“What is that temperature difference?” inquired Alfredo.

“The difference is 32 degrees,” shouted Malaika,

“I am now led to believe that the freezing point of brine is zero degrees on the Fahrenheit scale, but the freezing point of pure water is 32 degrees on the Fahrenheit scale and zero degrees on the Celsius scale,” claimed the excited Malaika.

“Why do you think so?” questioned Dane.

“She is indeed correct,” interrupted Kwame, “and I shall choose to explain why this is so,” he added.

Malaika gave a little victory dance because of her perception.

“Why is this so?” questioned Barton, too anxious to hear the reason from either Malaika or Kwame.

“The great scientist, Fahrenheit, chose a larger scale than did Celsius,” started Kwame.

“On the Fahrenheit scale, Daniel Gabriel Fahrenheit chose the freezing point of brine to be zero degrees and found that the reading for pure frozen water would now be 32 degrees,” the plump tutor explained. “Next, the boiling point of water was found to be 212 degrees on the Fahrenheit scale,” continued Kwame.

“So, on the Celsius scale, the difference between the temperatures of boiling water and frozen water is, $100 - 0 = 100$ degrees, whilst on the Fahrenheit scale this difference is $212 - 32 = 180$ degrees,” calculated Barton.

“This means that the measure of 100 degrees on the Celsius scale is equivalent to 180 degrees on the Fahrenheit scale,” concluded Dane, sitting next to Barton and nudging him on the side.

“You are quite correct,” said the tutor, admiring the deduction of his pupils under his tutelage.

It was at this moment that Shanna’s piercing voice rang out and her eyes sparkled as she shouted.

“I am sure that I have figured it all out, please hear my thoughts,” she begged.

Six smiling faces now turned in her direction was a silent announcement of instant approval.

“Since 100 degrees Celsius is equivalent to 180 degrees Fahrenheit, then 1 degree will be equivalent to $(180 \div 100)$ degrees Fahrenheit and which is, $\frac{9}{5}$,” said Shanna.

“Bravo, Bravo!” exclaimed Kwame.

“Hence, in order to convert from degrees in Celsius to degrees in Fahrenheit, we have to multiply by the factor of, $\frac{9}{5}$,” continued Shanna excitedly.

Kwame began to applaud as Shanna’s reasoning was sound. The others looked on at her with deep admiration.

“I am not finished as yet,” she interrupted the premature compliments that were filtering through.

“However, the temperature of zero degrees Celsius, the lowest point on the Celsius scale, is 32 degrees on the Fahrenheit scale. Hence, the temperature, in degrees Celsius is first multiplied by the factor of $\frac{9}{5}$, to get its equivalent difference in degrees Fahrenheit. Finally, 32 is added to obtain the equivalent reading on the Fahrenheit scale.”

Shanna looked at Kwame and the other five pairs of eyes deviated in the same direction. The girl’s explanation appeared quite sound and made good sense to the listeners. Approval was sought.

Kwame looked outside the window of the treehouse and held his hands behind his back. He turned and then looked rather solemnly at Shanna and

his friends. Kwame smiled and his voice tolled an exciting curfew to an equally exciting lesson.

“I could not have explained it better,” he said.

But as all heralded Shanna brilliant and deductive reasoning, a frown emerged on the forehead of Malaika. The others noticed it too.

“What ails you, my dear friend?” enquired Dane, in a sympathetic but comical tone.

But Shanna seemed lost in her thoughts. It was only when Dane repeated the question, with an increased decibel level, was there a response.

“I was wondering about the situation where one might have had to convert a temperature from degrees Fahrenheit into degrees Celsius,” said Shanna, finally.

“That is the reverse of what we have seen,” commented Alfredo.

Kwame looked a bit awkward when the others looked at him for an answer to Shanna’s small dilemma.

“I never performed a conversion or even read about the conversion of any temperature from degrees Fahrenheit to degrees Celsius,” muttered Kwame.

“I feel certain that we can create a formula for the reverse process,” said Barton, sounding hopeful and passing this emotion onto the others.

“Do you have any ideas of how this can be done, Barton?” asked the others.

“I surely do,” said Barton. “It is based on something that we learned in class. I see no reason why it is not applicable in this case,” claimed the optimistic one.

Barton walked to the front, whilst Kwame occupied his seat. Dane shifted slightly, making way for Kwame’s ample physique.

“You have done a great job,” he said to Kwame. “Let’s see what Barton has to offer in the way of Shanna’s question.

