THE BARTON SERIES

STEPPING UP WITH BARTON

BY

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(Ages 8 and over)

STEPPING UP WITH BARTON

TABLE OF CONTENTS

Let Us Convert

Barton arrived at school one morning, a bit earlier than usual. There remained at least one-half of an hour before the bell would toll for the start of the new school day. Barton refused to sit idly. The day was 'young', thought Barton. The young boy had rested well on the night before. He decided to place his schoolbag at his desk and then venture outside the classroom.

As Barton walked along the corridors and away from his desk, he noticed a young boy looking very puzzled. The boy was struggling with a mathematics problem from his workbook.

Barton paused and inquired as to why the little boy was encountering such difficulty. The boy looked rather confused and confessed that he was having difficulty with addition involving metres and centimetres.

"It isn't that I haven't been trying," he lamented.

Barton generously offered to assist the boy and invited him across to his classroom.

“I hope that I master this topic,” said the boy. “We shall be tested on it soon, and I want a grade A on my test.”

Barton placed his bag at the side of his desk and took out his notebook. The little boy stood alongside him, anxious to see if the popular senior could help him. Hope sprang eternal as he looked and listened.

“Do you know the number of days that make up a week?” asked Barton.

The boy quickly responded with the correct answer of seven.

He proudly informed Barton that he could also convert days to weeks and weeks back into days if ever he was requested to do so.

Barton decided to test his student’s ability and ensure that his boast was not idle. He asked for the boy to convert 10 days into weeks and days.

Quick as a flash the boy wrote,

$7\overline{)10}$, which he correctly worked to get $7\overline{)10}$ 1 rem 3

The boy whispered to Barton that ‘**rem**’ was the shortened form of the word ‘remainder.’

Although Barton knew this, he smiled and pretended to be astonished. The boy went on to explain that 10 days were, therefore, the same as or equivalent to 1 week and 3 days.

“I used division to derive the answer. It shows us that in 10 days there is one group of 7 days and the remainder of 3 means, 3 days are over and insufficient to complete another group of 7 days,” said the proud, little boy, with a broad smile on his face.

He looked at the senior, Barton, observing him with keen interest. He was unsure of what the big boy was thinking.

“You are quite correct,” Barton confirmed and was rather impressed.

Barton decided to give yet another problem for the boy.

“Would you be capable of converting 18 days into weeks and days?” asked Barton.

The boy did not answer. He simply began promptly, with a small smile etched upon his face. Maybe Barton doesn’t believe in my skills, he thought.

Yet again, the young boy was quick to the task and correctly wrote, $7\overline{)18}$

and which he worked to obtain, $7\overline{)18}$ 2 rem 4

“Barton,” explained the boy, “18 days have 2 groups of 7 days and a remainder of 4. This means there are 2 entire weeks and a remainder of 4 days. So, 18 days consist of 2 weeks and 4 days.”

Barton was again quite impressed by the boy’s understanding of converting days into weeks. He decided to switch his line of questioning around.

“I would now like you to convert 3 weeks and 1 day, into days,” requested Barton.

The boy again did not hesitate with the reverse procedure. He easily explained to Barton that 1 week consisted of 7 days and so 3 weeks will consist of 3 multiplied by 7 days. He calculated this to be 21 days, as he recalled his multiplication tables. The boy remained smiling all along as he worked.

Then, the little boy added on the 1 day onto the 21 days of the three weeks and concluded that 3 weeks and 1 day consist of a total of $21 + 1 = 22$ days.

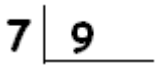
Barton continued to challenge the young boy and tested him with yet another, though slightly different, question. He now wanted the boy to add two sets of weeks and days. Barton wrote,

The boy embraced the challenge at once. He first added the numbers, from the 'days' column, and wrote, 3 + 6 = 9 days.

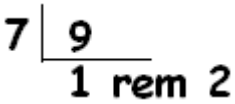
He thought for a moment and said.

"The number 9 is greater than the number, 7, which is the number of days in one week. So, I must now convert 9 days into weeks and days."

The boy wrote,



, which he worked out to get



"If 9 days is one week and 2 days, then the 2 should be placed in the answer column for 'days'. The 1 week will now have to be inserted into the column for weeks to be added with the weeks already written in that column."

The boy then wrote, 2 + 1 + 1 = 4 weeks

The answer to the question of the addition was 4 weeks and 2 days.

The answer was correct and the working method was indeed sound.

Barton realised that the boy undoubtedly understood conversion quite well.

"The very same principle is used for the addition involving metres and centimetres," advised Barton.

The small boy appeared rather surprised. His eyes popped from his head and he pretended to faint. Barton laughed at his antics.

“This principle that you have mastered so well is also the same principle involved in any other type of measurement conversion, whether the calculations involve addition, subtraction, multiplication, or division,” continued Barton to the astonished boy.

“If that true, Barton?” asked the boy. “If so, I need to tell this to Mario, Carmen, Ahmed, Jude, Hyacinth, Ricky, and Marcelle,” he shouted.

“Concerning the question, I do know that 100 cm is equal to 1 metre,” the boy said to Barton.

“If you do, then perhaps you can convince me of your great skills by converting 230 cm to metres,” was Barton’s immediate response.

“I shall do my best, Barton,” the willing boy replied.

The boy was a bit hesitant at first, but he eventually wrote,

$100\overline{)230}$, and which he worked to get

$$\begin{array}{r} 2 \text{ rem } 30 \\ 100\overline{)230} \end{array}$$

He found there to be 2 groups of 100 and the remainder of 30.

“Is 230 cm really 2 metres and 30 cm?” asked the boy, sounding most unsure.

The little boy was elated to discover that his answer was correct. He stepped aside and yelled in glee, jumping only a short distance upwards from the floor as he did so. His small size and fat body were both height-restricting factors in his jumping ability. He succumbed quickly to the natural law of gravity.

“Now, can you convert 3 metres and 40 cm to centimetres?” challenged Barton, laughing at the boy’s comical display of joy.

The boy seemed cautious and thought for a while, mumbling to himself. Then he wrote and spoke at the same time.

“I must multiply 3 metres by 100 to convert to centimetres since 100 cm is equal to 1 metre. This will give 300 centimetres. Then I shall add on 40 cm to get a total of 300 + 40 = 340 centimetres.”

Barton was pleased with him and applauded the boy.

“That was excellent,” he said to him.

The boy began to smile as he came to realise just what Barton had done. He quickly opened his book with the questions which teased him earlier on.

“I shall attempt the first question, Barton. I shall work and think aloud. Just watch me,” he said. “I know exactly what you have done,” he added smilingly.

The first question was,

m	*cm*	
4	80	
2	60	+

The boy first added quantities in the ‘cm’ column, 80 cm + 60 cm, and got 140 cm.

“The total of 140 cm has one group of 100 cm and a remainder of 40 cm,” he said, getting no response from Barton.

He then placed the 40 cm in the ‘cm column’. Then he added on the 1 m to the quantities already in the metres column to get, 4 + 2 + 1 = 7 m

The result got for the question on the addition was 7 m and 40 cm. It was perfectly correct and the thinking process used was most admirable.

The little boy was all smiles as he wrote down the second question.

m	cm
6	20
2	80

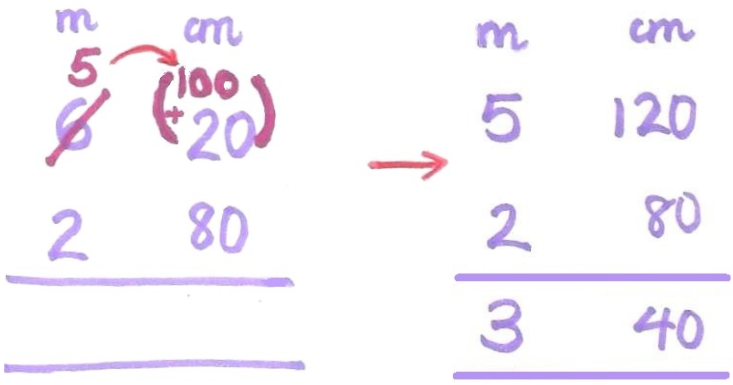
The boy now thought and spoke to himself.

“I cannot subtract 80 cm from 20 cm since 20 is less than 80.

I, therefore, need to take 1 metre away from the 6 m of the left column and which is the metres column.

I shall add 1 m to the 20 cm thus making it become 100 cm + 20 cm = 120 cm.

Now I can subtract 80 cm from 120 cm to get 40 cm.



I shall place 40 cm as the answer under the ‘cm’ column.

I can now easily subtract 2 m from 5 m, and this is so because the original 6 m was reduced to 5 m when I took the 1 m away. This will result in 3 m.”

The little boy looked up at Barton.

“My answer was found to be 3 m and 40 cm,” he told Barton.

Barton confirmed the answer to be correct and was quite pleased.

“Both your method of work and thinking process were sound,” he commended the overjoyed little boy.

It was a thankful and happy little boy who left Barton's class. He would go to his class and await the school bell's announcement for the start o**f** the school day.

As he departed, Barton reminded him that the same principle holds for the conversion of all types of measurements.

"The same method and thinking processes which you just used, shall be used for questions involving weeks and days, metres and centimetres and so on.

"So, it can also be used for questions that involve years and months, metres and kilometres, litres and millilitres, grams and kilograms," suggested the small boy.

Barton nodded as he gave him a pat on the back.

The grateful boy thought that Barton was gifted. He hurried off to class, ready to help some of his friends who were also struggling with the same problem.

Since I am now so good at conversion in mathematics, then maybe I am what some people call a 'convert', he thought to himself.