THE 2021 YOUNG MATHEMATICAL STORY AUTHOR (YMSA) COMPETITION

THE STUART J. MURPHY AWARD

(THE 8-11 YEARS OLD CATEGORY)

SHORTLISTED

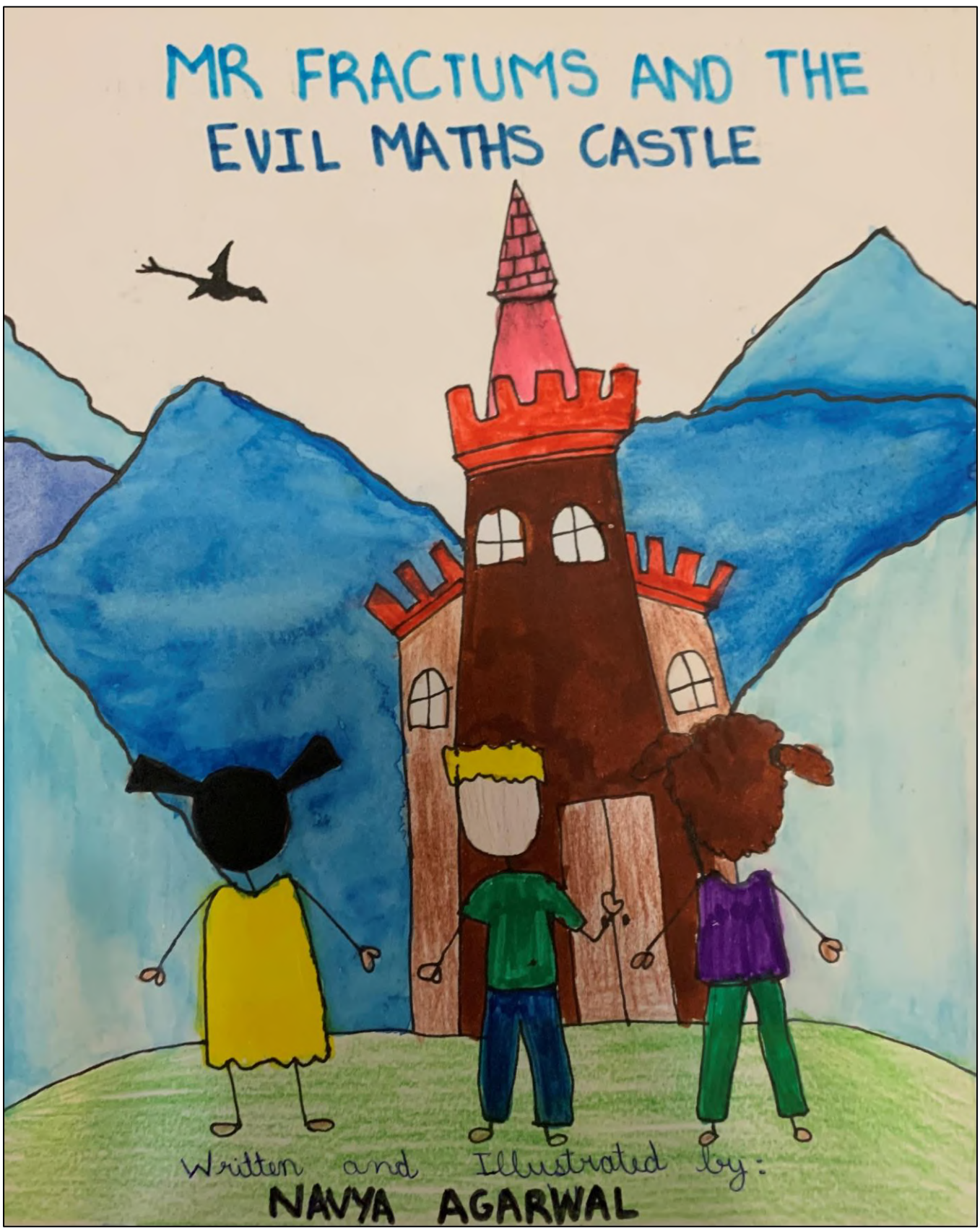
‘Mr Fractums and The Evil Maths Castle’ by Navya Agarwal (11 years old)

at Oberoi International School JVLR (India)

You can read the author’s inspiration for the story and the judges' comments on:

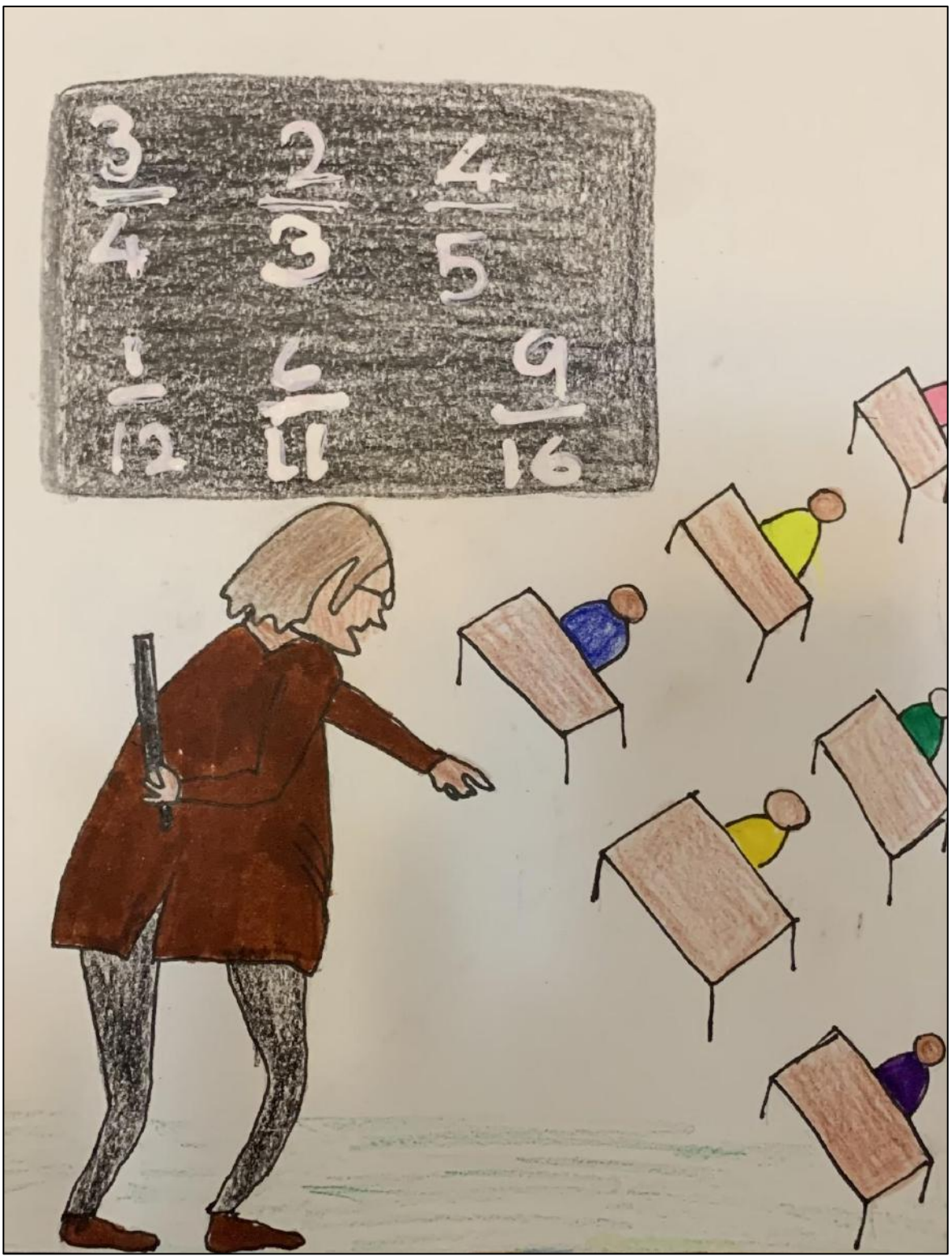
www.mathsthroughstories.org/ymsa2021

#YMSAMaths



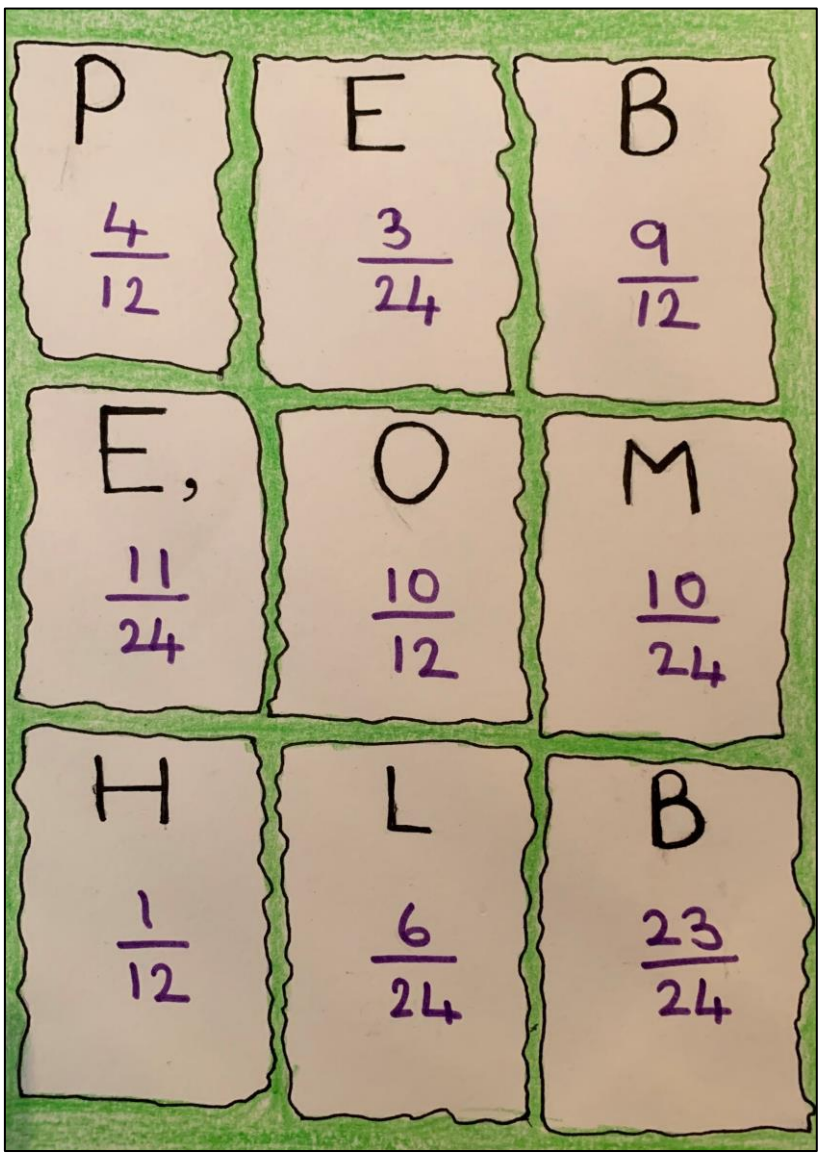
Oberoi International School JVLR, Mumbai

There was once a school where no child laughed or smiled all because of one evil math teacher, Mr Fractums. “He gives such difficult math tests,” some children would say. “He even locks up children in the Evil Maths Castle who fail in his exams,” said the others. One day while Mr Fractums was correcting the exam papers, he found out that a boy named Bob failed the test.



The next day, Bob’s three friends, Toby, Masaba and Radhika noticed his absence and decided to search for him. They looked for him all around the school and his home but he was nowhere to be found. “Where could he be?”, asked Radhika. The friends got very worried for him.

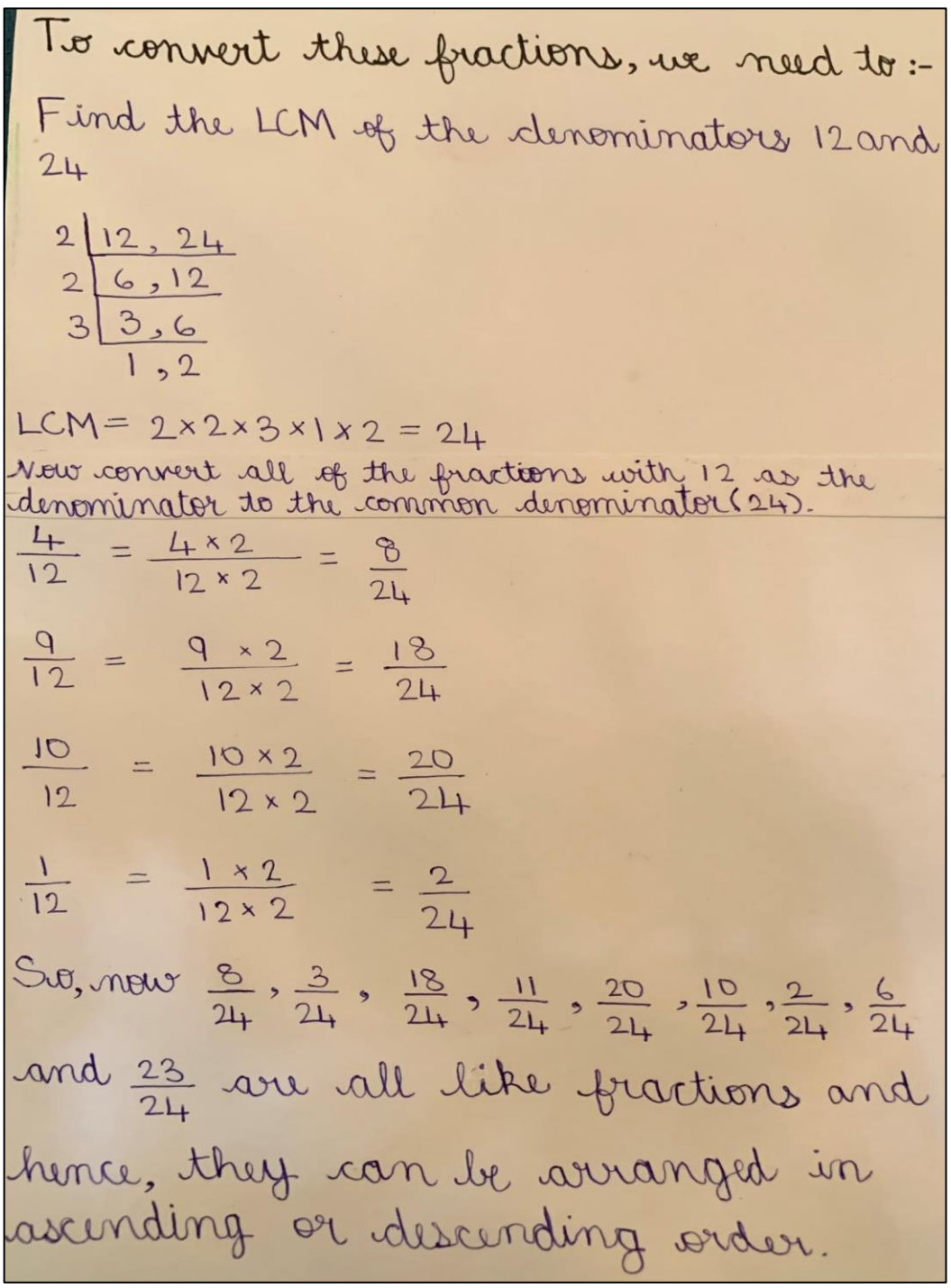
As they were talking, a strange bird flew overhead and it dropped 9 chits of paper on the ground. On the top of each chit were some random letters and below them were some fractions.



Looking at the chits, the children got confused. What are these chits for? What do these letters and numbers mean? Is it some kind of hint? They tried a few combinations using the letters but nothing made sense. They then decided to arrange the fractions such that the letters would form some kind of message.

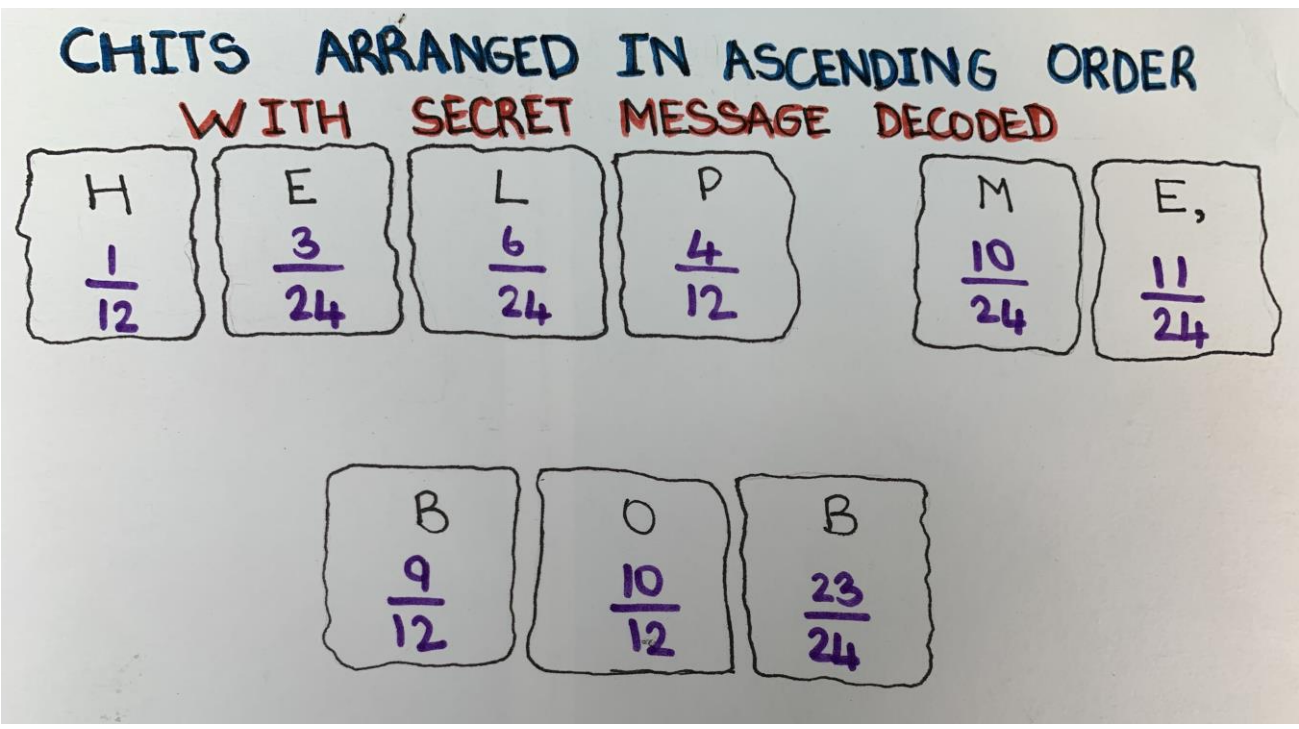
"Let's convert them into decimals and then arrange them in ascending or descending order," said Toby. They tried converting the fractions into decimals but soon realised, the calculations were getting complicated. "To convert fractions into decimals, it is easier to change the denominators of the fractions to 10, 100 or 1000, but 12 and 24 are not factors of either one of them." said Masaba. Radhika nodded and added "Yes, that is probably why the calculations became so complicated and lengthy." "That's true, but now what should we do?" asked Toby. "I know a way that will be faster and easier to convert and that is to make them all Like Fractions!" suggested Radhika.

“But what are Like Fractions?” asked Toby scratching his head, “I wasn’t paying attention in class when Mr Fractums was explaining this concept.” Radhika then explained, “Oh Toby! Fractions with the same denominators are called Like Fractions and a set of fractions with different denominators are Unlike Fractions.” To this Masaba added, “Yes, also, while converting Unlike Fractions to Like Fractions, the LCM of the denominators of the fractions is used as the common denominator.” “Oh! Now I remember! To convert these fractions into Like Fractions, we need to find the LCM of the denominators which in this case is 24 and then because 12 multiplied by 2 is 24, we will multiply the numerator and denominator of those



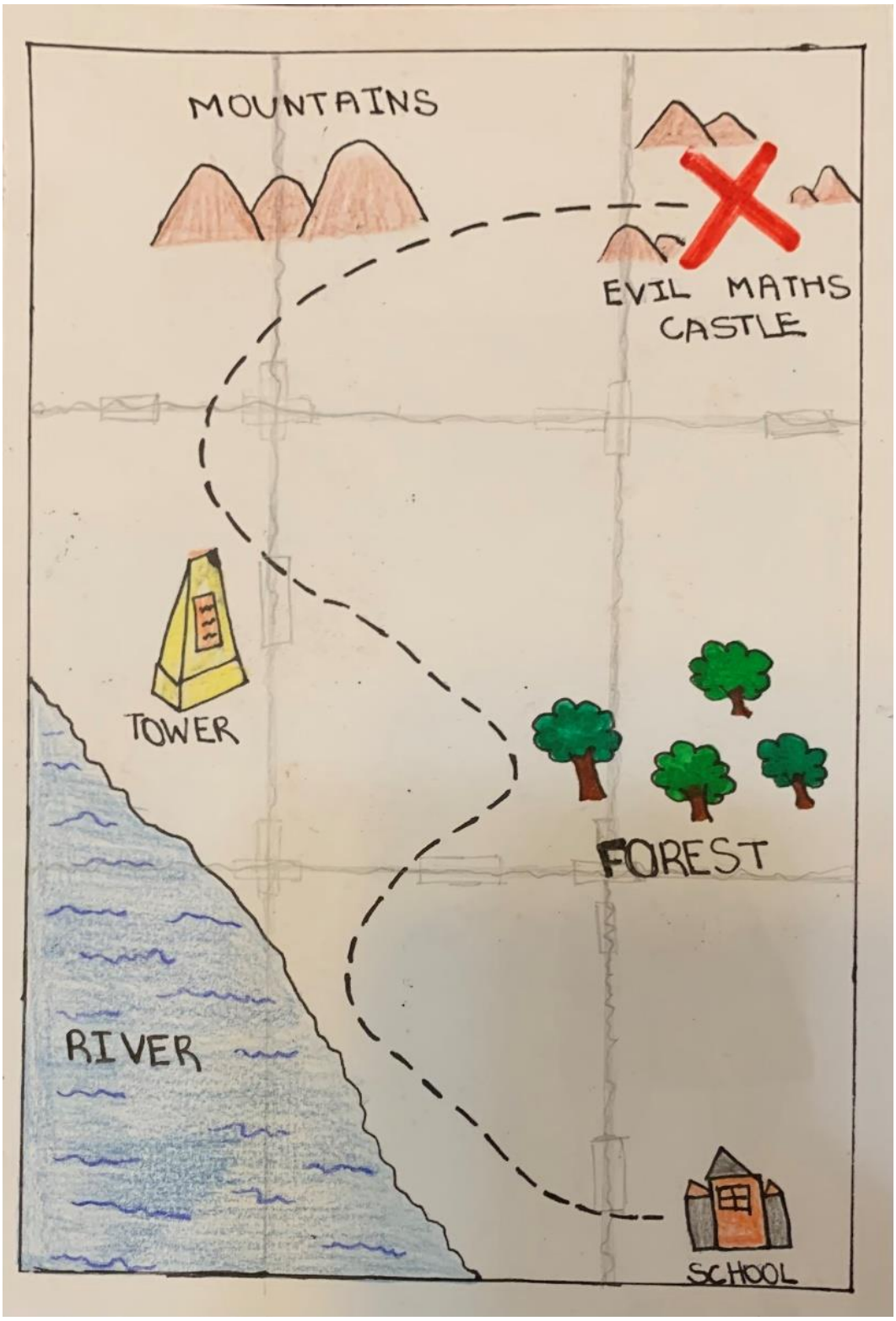
fractions which have 12 as the denominator by 2 and leave the fractions with 24 as the denominator as it is, right?" confirmed Toby. "Yes! Now you're talking." said Masaba.

After converting all of the fractions into Like Fractions, they arranged all of the chits in descending order according to their numerators, hoping this would help them make sense of the chits. 'BOB ,EM PLEH'. What does that mean? Is this some message from Bob? "Looks like we have arranged it wrong. Let's try and arrange them in Ascending Order," suggested Radhika. And yes! It did work! They squealed in excitement and quickly read the message. It said, 'HELP ME, BOB'.



Did you know: *To compare Unlike Fractions having the same numerators but different denominators, we should compare their denominators. The fractions with the smaller denominators have a larger value.*

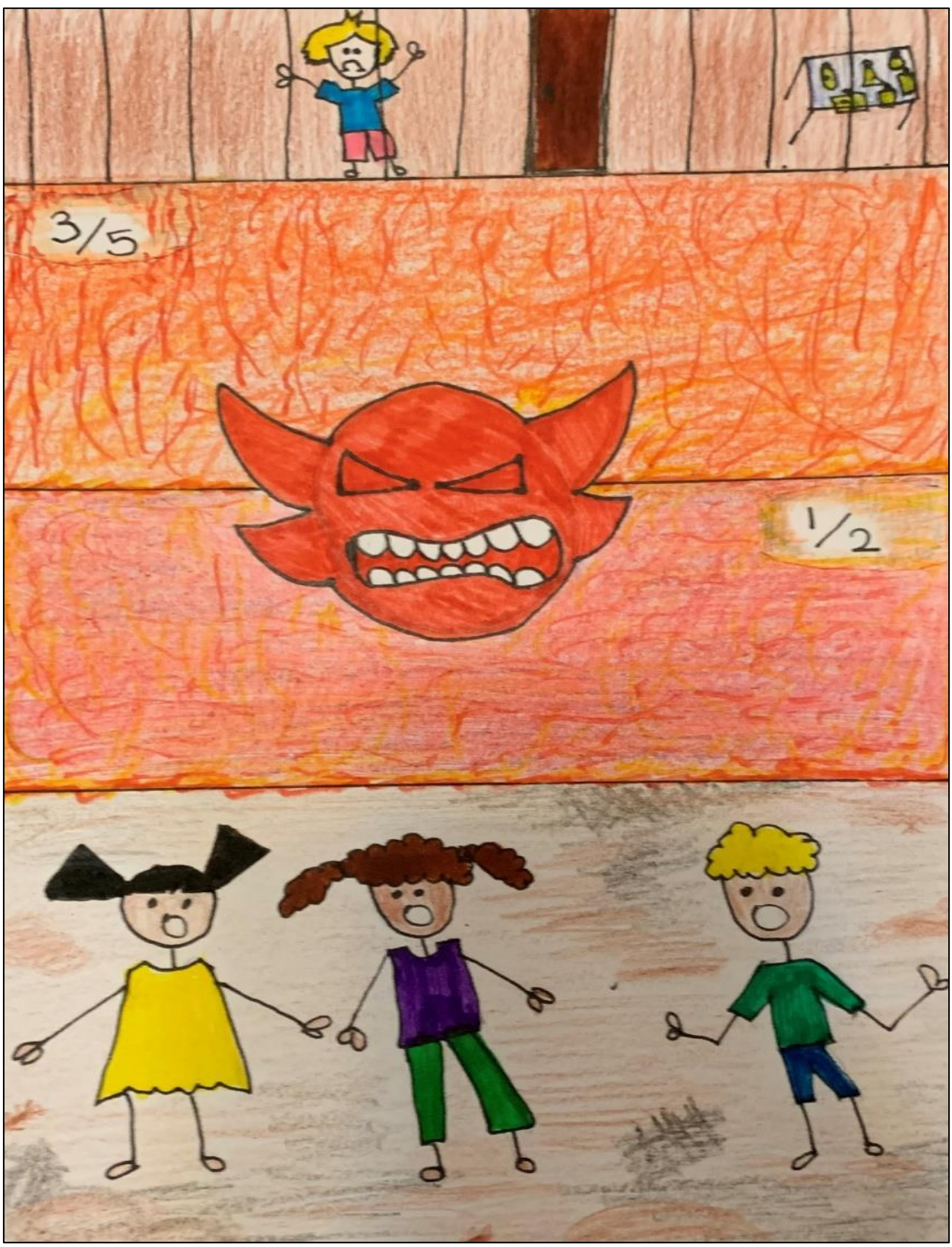
Bob was in danger and he needed their help. But, how could they? Where was he? The children's minds were filled with numerous questions. They again glanced at the chits and noticed some images and squiggly lines at their back. Masaba exclaimed, "Now what are these for?" Toby suggested, "Let's tape up the chits and see what those lines form."



To children's very astonishment, they saw a map to the Evil Maths Castle form before their eyes!

Radhika and Masaba shouted in unison, "Now that we know where Bob is, let's go right away and save him." Toby on the other hand said, "No way! We can't risk our lives and go to the Evil Maths Castle! What if we also get stuck there?" Radhika thought for a moment and said, "No Toby. Bob is our friend and he needs our help. We cannot abandon him. Plus, a friend in need is a friend indeed. We have already come so far so we can't stop now!" "Yes, we are three brave friends. We are a team!" agreed Masaba.

They followed the map and finally reached the castle. It looked like a haunted palace that had been abandoned for several years. Masaba shook like a leaf but Toby held her hand and consoled her. When they opened the door of the castle, it made a loud, creaking sound. Despite their fears, they all rejoiced at the sight of Bob. But alas! He was locked up inside a prison with steaming hot lava all around it. To make matters more complex, the lava was divided in two sections!



Suddenly, the floor started shaking and a devil head appeared from the lava and boomed in a loud, deep voice, “You cannot free up your friend so easily.”

Toby asked the devil head in a quivering tone, “Then what do we need to do to free up Bob?” “You can’t do anything. The solution to free up Bob is with him in the prison,” roared the devil head.

The three of them looked at each other in uncertainty but before they could respond, the devil head disappeared into the lava.

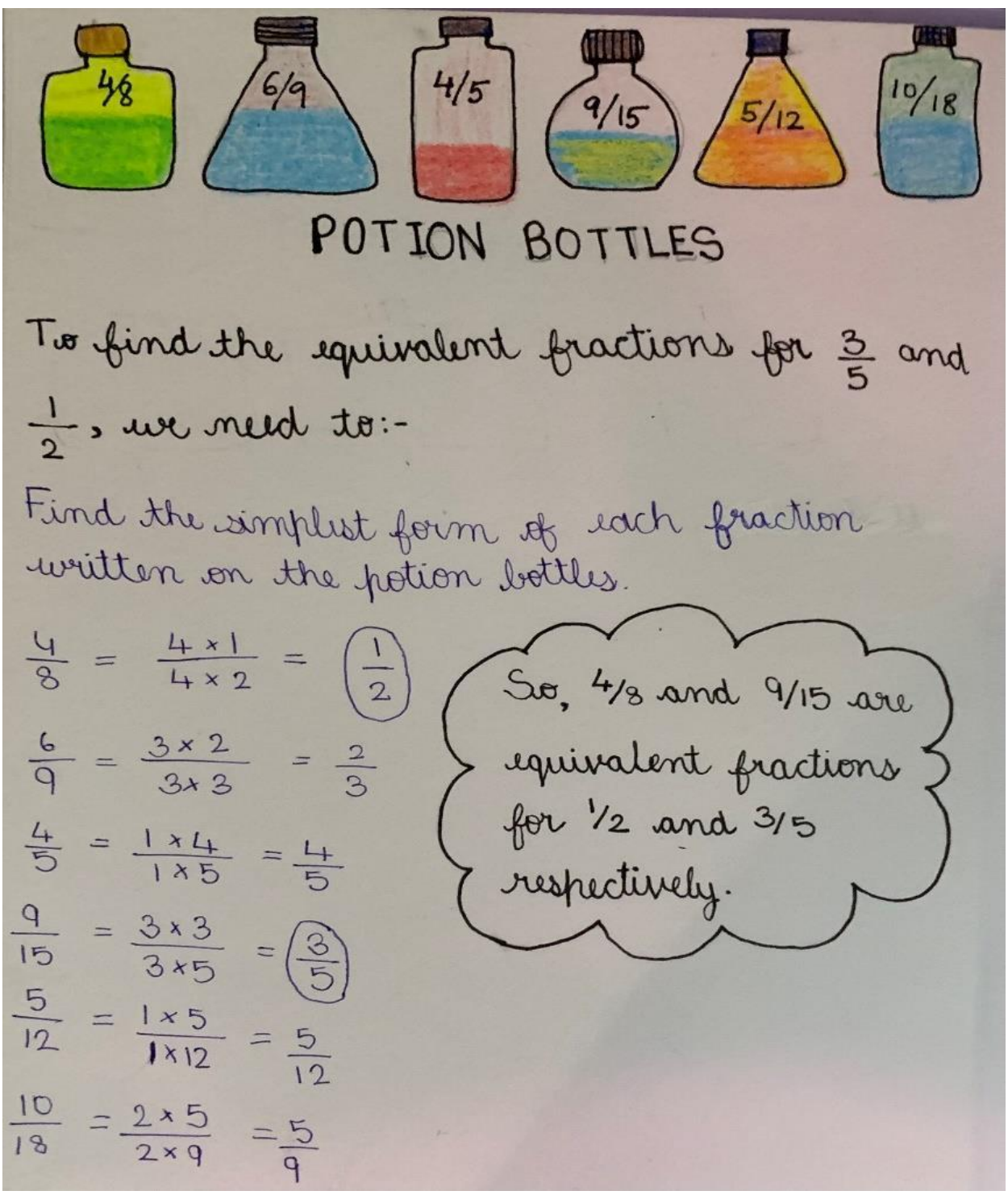
Masaba asked Bob what was in his prison. “There are some bottles with potions inside it and a fraction written on each.” said Bob.

“Wait a second, I see a fraction floating on this part of the lava!” exclaimed Radhika excitedly. “There is one more over there.” said Toby. Bob then said irritated, “I have already tried looking for bottles with the same fractions as the ones on the lava. But none of them are the same! We can’t do anything.”

Radhika then thought for a moment and said, “That’s okay Bob, let’s try finding their equivalent pairs.” “But I don’t know what are equivalent fractions!” exclaimed Bob sheepishly. “Don’t worry Bob! We will help you.” said the three friends. Masaba then explained confidently, “Fractions having the same value are called Equivalent Fractions. Equivalent Fractions can be found by multiplying its numerator and denominator by the same number (other than zero).” Bob got puzzled and asked, “Okay, but how do we find out if two fractions are equivalent or not?”

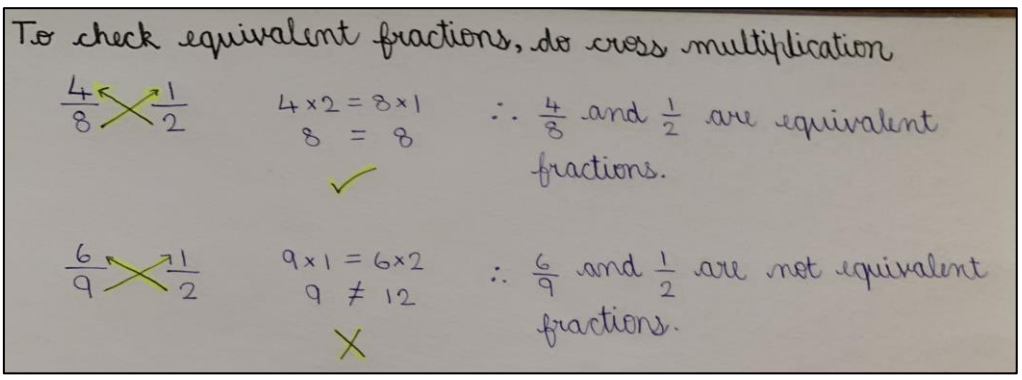
Masaba thought for a moment and said, “There are two ways to check it – We can either convert the fraction into its simplest form which means there is no common factor between the numerator and denominator, other than one. We can also check whether two fractions are equivalent or not by cross multiplication.

For this, we multiply the numerator of the first fraction with the denominator of the second and the denominator of the first fraction with the numerator of the second. If the two products are equal, then the fractions are equivalent, otherwise they are not.” “Oh, I think I get it now. Let me try the first one.” Bob said feeling better and more confident.



“Yay! I have the potion bottle with 9/15 written on it which in its simplest form is 3/5. Let me try pouring it on the first lava section.” said Bob excitedly. To his delight, one section of the lava solidified immediately allowing Bob to come closer to his friends. “This is so amazing!” said Bob happily.
“Let me quickly find the next bottle. I can’t wait to get out of here.” Toby excitedly shouted, “So, the number written on the next section is 1/2.”

Did you know?



Bob then poured the potion on the next section of lava which again solidified. He squealed with joy and came running and hugged his friends. “Thank you so much guys for saving me and teaching me the concept of equivalent fractions! You all explained the concept so nicely and supportively. Math isn’t as difficult as I thought!” said Bob. Toby then said, “Yes Bob, once you understand the concept, you should practice it and the more you practice, the better you will become!”

They then rushed out of the castle and returned to their school. The children told the Headmaster, Mr Al Geebra, all about their misadventure. Mr Al Geebra spoke to Mr Fractums about kids’ fear of him and maths. When Mr Fractums learned about it, he realised that the children had used the concepts he taught them for good and that he was creating unnecessary fear of maths. From there onwards, Mr Fractums started teaching maths with a more encouraging and positive approach and all of his students now started liking him and maths. And the best part was that no kid called him evil anymore and Mr Al Geebra built a Maths lab in place of the Evil Maths Castle!

There was once a school where no child laughed or smiled all because of one evil maths teacher, Mr Fractums. It was rumoured that he locked up students in the Evil Maths Castle if they failed his tests. One day Bob goes missing. Can his friends Radhika, Toby and Masaba find him? Read their exciting adventure to find out more.

Acknowledgements:
I would like to thank my parents for their continuous encouragement and support. I would also like to thank my maths teacher, Ms. Shruti Kulkarni for her valuable feedback and guidance and making maths so much fun to learn in the classroom.

About the Author:
My name is Navya Agarwal and I am a student at Oberoi International School, JVLR, Mumbai. I am 11 years old and am an avid reader who loves fantasy and fiction stories. I also enjoy doing maths and so I have tried weaving two of my interests together. I wrote this story to help children understand the concept of Like and Equivalent Fractions in a fun and easy to understand way.