

wizarding maths

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The following investigation into ‘maths from a story’ started almost by chance with a conversation in a seminar with final year primary ITE [1] students. This took place just before the release of the film of the first of the Harry Potter books [2] that have found international favour among children and grown-ups. The conversation also centred on making maths motivating for children in school by drawing upon interests from outside school. The Harry Potter books were an example of a good stimulus for ideas.

It was refreshing to hear students thinking in a cross-curricular way about mathematics as a contrast to the discussion about numeracy hours. This kind of starting point, which was so familiar to teachers who trained at a similar time to myself, has ceased to play the same role in our training of students. Yet, when looking at Curriculum 2000 and the emphasis on numeracy across the curriculum, it would appear to be a good way of getting students to think about the links between subjects.

I started the ball rolling by producing a good old-fashioned topic web brainstorm. The group of students then worked on specific ideas to produce resources for use in the classroom.

They were working in their own time, before their final teaching placement and I was impressed by their creativity. There is clearly a lot more that could be worked on from this particular starting point and we hope this article will provide food for thought to students and teachers alike.

For both long-standing teachers and those about to join the profession, it is reassuring to see that creative approaches are still alive and kicking in the classrooms of the future; and from non-maths specialists!

‘Collecting Candy’ board game

The aim of the game is to roll a dice to travel from start to finish on the board (see page 24). On the way, players should collect as many sweets as possible whilst faced with challenges from the fat lady and the basilisks. It is not all doom and gloom however – it is possible to overcome their challenges with the help of the moving staircases. Sweets collected must be recorded onto a tally table, which can be used to create a simple bar chart.

Good luck!

COLLECTING CANDY DATASHEET



Name..... Date.....

Complete the following tally table

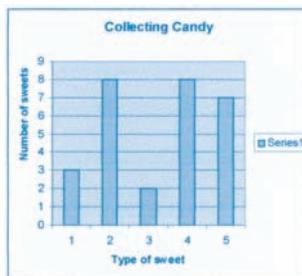
Type of sweet	Tally	Total

Now create a bar chart using the information from your tally table

The tally table and bar chart that result from the board game can be varied to suit different children and to include different information. For example:

- intervals on the graph can increase by more than one
- children can be asked to label and choose the appropriate scale on a blank graph
- extended eg, ice mice, creamy chunks of nougat and black pepper imps

Type of sweet	Tally	Total
Fizzing whizzbees	lll	3
Cockroach cluster	llll llll	8
Exploding bonbons	ll	2
Levitating sherbert balls	llll llll	8
Toothflossing string mints	llll lll	7



The completed graphs can be used to generate and answer questions to encourage the children to interpret the graphs. Children can also compare and contrast different representations of data eg, pie charts and bar charts.

Footnotes:

- 1 Initial Teacher Education
- 2 J.K. Rowling: *Harry Potter and the philosopher’s stone*, Bloomsbury, 1997

Collecting Candy

Devised by Nicky Lenton



FINISH

	Dropped your bag of candy. Slip back to 56	99	98	97	96	95	Bonus. Collect 8 Exploding Bonbons	94	93	92	91
81	82	83	84	85	86	87	Hedwig drops the mail. Miss a turn	88	89	90	
80	79	78	77	75	74	73	72	71			
Hedwig brings 3 Cockroach Cluster in mail. Climb to 95	61	62	63	64	65	66	67	68	69	Climb the Moving Staircase to 87	
Avoid being caught by Peeves. Collect 7 Toothflossing String Mints	59	58	57	56	55	54	53	52	51		
	41	42	43	44	45	46	47	48	50	50	
Collect 5 Cockroach Clusters hidden behind cauldron	39	38	37	36	35	34	33	32	31		
Collect 3 Fizzing Whizzbees	21	22	23	24	26	27	28	29	30		
	20	19	18	17	16	15	14	13	11		
Go up the Moving Staircase	2	3	4	5	6	7	8	10			
START											

Illustration by Tamaris Taylor

Wizarding Money

Devised by Jane Farncombe

Currency at Hogmeads consists of galleons (g), sickles (s) and knuts (k)

In the novel 'Harry Potter and the Philosopher's Stone':

1 gold galleon is equal to 17 silver sickles

1 silver sickle is equal to 29 knuts

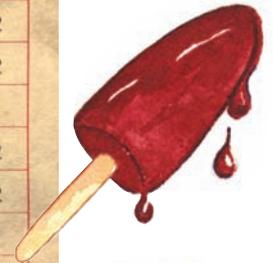
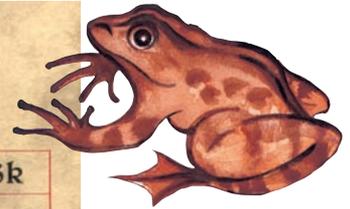
The exchange rate can be altered according to the abilities of the children. For example of problems see p26.



HONEYDUKES PRICE LIST

1 galleon is worth 5 sickles. 1 sickle is worth 5 knuts

Chocolate frogs			3k
Hot butter beer		2s	
Acid pop	small bottle	1s	3k
	large bottle	2s	4k
Droobles best blowing gum		1s	
Tooth flossing string mints		1s	4k
Ice mice each			2k
Exploding bonbons 1 packet		2s	
Blood flavoured lollies 1 costs			3k
Levitating sherbet balls 1 costs			4k
1 packet of 4		3s	
Bertie Botts every flavoured beans	small packet	1s	2k
	large packet	3s	



Illustrations by Tamaris Taylor

FLOURISH AND BLOTTS (Booksellers) FIRST YEARS' PRICE LIST

The standard Book of Spells (grade 1)	10s	10k
A History of Magic	2g	3s 14k
Magical Theory	1g	8s 25k
A Beginners' Guide to Transfiguration	5s	8k
One Thousand Magical Herbs and fungi	2g	8s 0k
Magical Drafts and Potions	4g	9s 14k
fantastic Beasts and Where to find Them	6s	6k
The Dark forces: A Guide to Self Protection	18s	





Hogsmeade Shopping Trip

The following questions were devised for KS2 pupils to accompany the 'Honeydukes price list' (page 25). They are designed for the national numeracy strategy and national curriculum requirements for pupils to solve word problems involving money.

How much change would you have from a Galleon if you bought 2 bottles of hot butter beer?

Neville Longbottom wants to buy some Levitating Sherbet Balls. In his pocket he has 2 sickles and 9 knuts. How many can he buy?

How much would it cost for 2 Blood Flavoured Lollies, 2 Ice Mice, 1 Large bottle of Acid Pop and a small packet of Bertie Botts Every Flavoured Beans?

Hermione has 2 sickles, how many Chocolate Frogs can she buy? How much change will she have?

How many packets of Droobles Best Blowing Gum can you buy with 17 knuts?

Hermione and Ron decide to buy Harry some Bertie Botts Every Flavoured Beans, they have 13 knuts between them, which packet size can they buy?



Gringotts Bank Exchange

Converting money

When Harry Potter starts at Hogwarts he has to convert his 'muggle' currency to wizard money.

An exchange rate can be given, eg; **£1.00 is worth 1 galleon and 2 sickles** Children could be asked to find £3 and £5 worth of 'wizarding' money.

The exchange rate could be changed or the Galleon devalued.

Today's exchange rate at Gringotts Bank is £1.00 to 5 sickles and 5 knuts

At the end of term Harry changes some 'wizarding' money into 'muggle' money for his stay with his aunt and uncle. He changes 1 galleon, 8 sickles and 25 knuts, how much would he have in sterling?

If Harry was given £ 3.00 at the Exchange how much wizard money had he changed? How many knuts would this give him altogether?

Find out how much Harry and his friends would have paid in 'muggle money' for each of the books on *Flourish and Blotts first years' price list* (p25). Handy Hint: find the value of the book in Knuts before trying to calculate the cost in 'muggle money'.

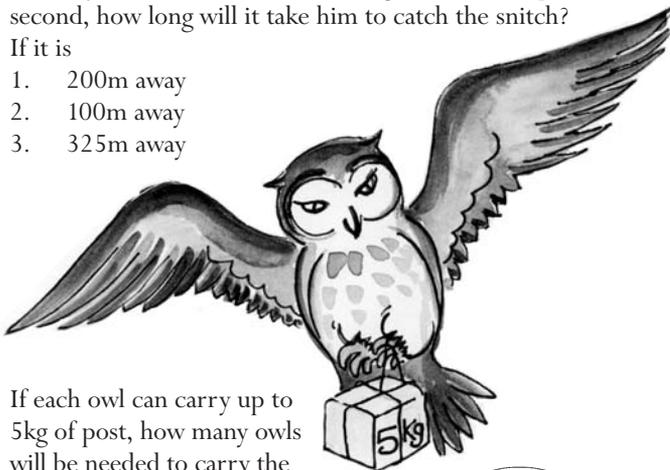
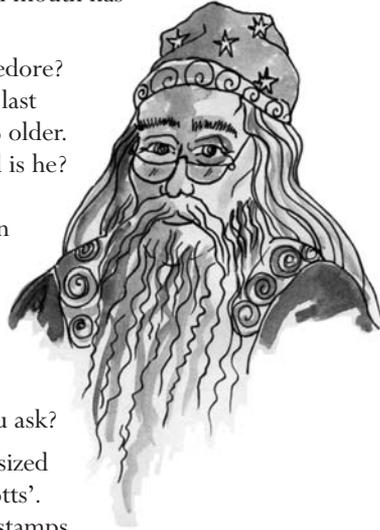


Answers for an exchange rate of
1 gold galleon = 17 silver sickles
1 silver sickle = 29 knuts are given on p39

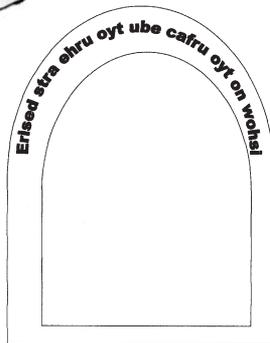
Mary Briggs lectures at the University of Warwick and at the time of writing Jane Farncombe, Jane Daniell, Nicky Lenton and Alan Stonehouse were Year 4 BA Qualified Teacher Status students.

Other 'Wizard' Ideas

- 3 times table using 'Fluffy, the three headed dog' eg, each head has 2 eyes, $3 \times 2 =$, each mouth has twelve teeth, $3 \times 12 =$
- How old is Professor Dumbledore? Mr Flamel was 665 years old last birthday. Dumbledore is 10% older. When was he born? How old is he? When was Mr Flamel born? How old was Mr Flamel when Dumbledore was 597? In 1945, Dumbledore discovered 12 uses for dragons' droppings, how old was he then? What other questions can you ask?
- Explore ratio using different sized books from 'Flourish and Blotts'. Some are the size of postage stamps others are the size of paving slabs . . . and many sizes in-between.
- If it takes the Hogwart's Express $3\frac{1}{2}$ hours to reach Hogsmeade station, at what time will it need to leave platform $9\frac{3}{4}$ in order to get there at (1) 10:30pm and (2) 22:30
- If Harry's Nimbus 2000 is travelling at 10 metres per second, how long will it take him to catch the snitch? If it is
 1. 200m away
 2. 100m away
 3. 325m away



- If each owl can carry up to 5kg of post, how many owls will be needed to carry the Christmas presents from Mrs. Weasley to Harry, Hermione and Ron? If the presents weigh . . . 50kg . . . 65kg . . .
- Use the 'Mirror of Erised' to explore reflection



UPDATE

From ATM's Professional Officer

June and July have been the busiest months so far for me as Professional Officer. This is when LEAs run extra courses for their teachers and schools want master classes for the post-SATs period. I also ran the ATM East Midlands Day Conference in Leicester on *Developing mathematical thinking*. The day was special for me, because of the enthusiasm and positive responses of all the delegates, who were clearly delighted to put aside national training priorities for a day and think about other issues! These included mathematical imagery, working without a text book and the role of the example. Offering courses which complement but also challenge the current orthodoxies is an important role for ATM, and LEAs are beginning to think this too. The courses I have run in Cornwall, Walsall, York, Bury and Darlington have covered a wide range of issues – one teacher in Bury said it was a real pleasure to come out for a day's training and not have another directive from the government put in front of him.

I have been heartened to meet so many committed and thoughtful teachers, who do care about helping their pupils to develop an enthusiasm for thinking about their own mathematics, in spite of the fact that performance of pupils and teachers is assessed through timed written tests which, by their very nature, cannot assess mathematical thinking in depth. But I have also been saddened by the teachers who feel ground down by the assessment regime. I have been surprised by the number of secondary teachers I have met who have been asked to teach mathematics, even though they have done little or no mathematics themselves since they were 16. Many, but not all, of these teachers are enthusiastic about this new challenge. Of course, this phenomenon is directly related to the current shortage of teachers qualified to teach mathematics. The government continues to be cagey about this and yet almost every teacher I have met this term, throughout the country, speak of vacancies in their mathematics department.

So what is to be done about this? The theme of the conference I attended in Cambridge in July was *Enrichment of Mathematics through Communication Technology* and several of the keynote speakers talked about making mathematics more popular and accessible. Some of the solutions they suggested involved doing this through special events outside the classroom. But it seems to me that the priority should be to make mathematics more fun *inside* the classroom, on a daily basis, and that can only happen if teachers think mathematics is fun. So how can we get more teachers like this? Maybe we should inundate MPs' postbags with letters about mathematics teacher shortages in our area.

Barbara Ball

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