Maths Mansion Part 1 is a unit of ten 10-minute programmes designed to support key objectives in the mathematics curriculum and in particular, aspects of the National Numeracy Framework. The Maths Mansion Part 1 package consists of a video, a Teachers' Guide, an Activity Book and a website: www.4learning.co.uk/mathsmansion

It is recommended that teachers preview the programmes to note the places they may wish to stop the tape to encourage discussion. The programmes could be used as part of the introductory class or main teaching activity. After viewing, there could be a whole-class discussion of the maths challenge presented at the end of each programme. Pupils could then do follow-up work on related activities.

The programmes would be very useful as part of the bank of resources available to support mathematics in school and used to introduce, consolidate or extend work on a particular topic.

Programme 1: Not the Great Big Hen
Multiplying positive integers by 10 or 100

This programme introduces the main characters – a group of youngsters, trapped in Maths Mansion by Bad Man who insists they take part in regular game shows to test their mathematics. If successful, they win a maths card. A complete set of maths cards is needed in order to escape. The Great Multiplier, one of three Maths Monster Machines, demonstrates what happens when numbers are multiplied by 10. Sad Man appears with his Great Big Hen and the Eggy Zeros. In the Great Hall, the contestants succeed in the final challenge and win their first maths card.

Viewers' challenge: Using four sevens, twelve blanks and twelve zeros, make four numbers each a hundred times the number below.

Answer: 7, 700, 70 000, 7 000 000

Programme 2: Not the Great Big Hen Again
Dividing positive integers by 10 or 100

The contestants are challenged to divide numbers by 10. Bad Man offers a decimal point to one contestant in the warm-up session. Sad Man uses a little green decimal pea. The Great Divider demonstrates, with alarming speed, what happens when numbers are divided by 10 and sings a catchy tune about moving digits to the right. The contestants take note of his advice and win a second maths card.

Viewers' challenge: Divide 654 321 by 10, by 100 and by 1000 by moving the digits.

Answer: 65 432.1, 6543.21 and 654.321

Programme 3: The Deciworms
Using decimal notation for tenths and hundredths

Sad Man introduces more of his strange creatures – Deciworms and the Decimole who likes to gobble up everything. He sings a song about tenths and hundredths. Decimole swallows the Deciworms. Bad Man visits a student campus and persuades a brave student to be measured using metres and Deciworms. The contestants run out of time in the final challenge and fail to win a maths card.

Viewers' challenge: What's the biggest number you can make that has got three digits, one decimal point, and is less than five?

Answer: 4.99

Programme 4: The Negs
Ordering positive and negative integers

In the Great Hall, the contestants count back successfully through zero. Bad Man, pretending to be a spy, bewilders passers-by, handing them negatives to pass on to the Blue Goose. The Negs are introduced. In the street, Bad Man checks some temperatures with volunteers who stand on a number line that runs from -5 to 5. The contestants succeed in the final challenge.

Viewers' challenge: Which is bigger, the difference in temperature between Saturn and the Arctic, or the difference between a frozen fishfinger and boiling water?

Answer: The differences in temperature are 140ºC for the difference between Saturn (-180ºC) and the Arctic (-40ºC) and 110ºC for the difference between a frozen fishfinger (-10ºC) and boiling water (100ºC). So the bigger difference is that between Saturn and the Arctic.

Programme 5: Fraction Aid
Relating fractions to their decimal representations

In the Great Hall, the contestants correctly match some decimals and fractions. In the street, Bad Man tries to raise public awareness of 'Fraction Aid'. He gives money to passers-by if they can work out fractions of a pound. The final challenge is too much for the contestants. They have to match fractions of a pound with the amount in pence and the decimal equivalent. No maths card this week.

Viewers' challenge: How much money is zero point two of a pound? What fraction of a pound is it?

Answer: 20p and $\frac{1}{5}$ of a pound

Programme 6: The Rounding Machine
Rounding up to one or two decimal places

Bad Man reminds the contestants that they have collected only three maths cards and they need seven before they can leave Maths Mansion. Decimole helps Sad Man even up his collection of worms by nibbling at one to shorten it and stretching out another. Bad Man gives contestants the rule that, if the digit after the decimal point is five or more, the number rounds up. The Rounding Machine is the latest of the Maths Monster Machines to appear. In the final test, the contestants win another maths card to add to their collection.

Viewers' challenge: I go to the market nine times and the bills are as follows: £2.10, £2.20, £2.30, £2.40, £2.50, £2.60, £2.70, £2.80 and £2.90. If I round each bill up or down according to the rules, do I make a profit, or does the man in the market?

Answer: Round down: £2.10, £2.20, £2.30 and £2.40 to £2 each to make 4 x £2 = £8.
Round up: £2.50, £2.60, £2.70, £2.80 and £2.90 to £3 each to make 5 x £3 = £15. So I pay £23 and the man in the market should have had £22.50. Therefore the man in the market makes a profit of 50p.

Programme 7: Get Some Fraction Action

Relating fractions to division

Sad Man introduces Mr Girhalf, Third Bird and Snorter. They like to make fractions but before they are able to show what they can do, Bad Man interrupts and starts dividing Mr Girhalf and friends into fractions. In the street, Bad Man causes confusion by giving away chocolate money. In the Great Hall, the contestants decide on a strategy for finding different fractional amounts and succeed in winning another maths card.

Viewers' challenge: When you work out a fraction, should you:
(a) divide by the bottom number then multiply by the top number?
(b) multiply by the top number then divide by the bottom number?
(c) it doesn't matter which you do first.

Answer: c

Programme 8: The Whole Class Should be Expelled

Understanding percentages and the equivalence between percentages, fractions and decimals

Sad Man has a percentage cake with 100 equal bits. Mr Girhalf wants half the cake, so he has 50 bits. Snorter wants a quarter – that is 25 bits. Great Big Hen wants a tenth – that is ten bits. Decimole appears and swallows the whole cake or one hundred per cent. In the Great Hall, the contestants have to answer questions against the clock. They are too slow and miss their maths card.

Viewers' challenge: There are 30 children in a class: 50% are girls. 20% of the girls have short hair, the other girls have long hair. How many long-haired girls are there in the class?

Answer: There are 15 girls; $\frac{1}{5}$ have short hair (3 girls) and so 12 girls have long hair.

Programme 9: The Queen of Tarts

Solving problems involving ratio and proportion

Sad Man introduces the story of the Queen of Hearts. The contestants complete their warm-up task easily. In the street, Bad Man does a survey to check that one in three people can walk on their hands. Sad Man explains why the King of Hearts was not happy about the ratio of tarts he was getting – he got one for every three the Knave had. In the Great Hall, the questions are on ratio and proportion. The contestants work well and win another maths card.

Viewers' challenge: There are 30 children in a class. The proportion of them that walk to school is one in three. The ratio of girl walkers to boy walkers is one in four. How many girl walkers are there?

Answer: There are 10 walkers in the class, so there must be 2 girl walkers.

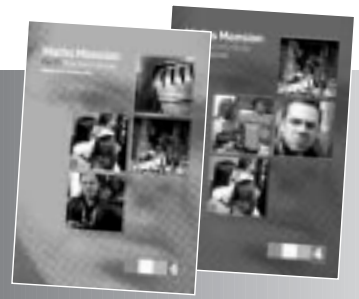
Programme 10: Doing Time

Solving simple time problems

Sad Man introduces an analogue clock, some Time Elves and a catchy tune to help viewers when using a 24-hour clock. In the Great Hall, the contestants cope with the warm-up questions. In the street, Bad Man startles two women by asking them if it is time for him to take his next dose of medicine. They suggest he ask a policeman. In the final test, the contestants work together to solve time problems. Unfortunately, they are not fast enough and fail to win a maths card.

Viewers' challenge: A film starts at 21:25 and finishes at a quarter past eleven in the evening. How long was the film?

Answer: The time difference, ie the length of the film, is 21:25–23:15, which is 1 hour and 50 minutes.



LEARNING

Mathematics for 9–10 year olds

Maths Mansion Part 1

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