The Strange Case of

The Calculating Mr One

By Michael Whitmore

Lyrics by Jessica Selous

Music by Gideon Escott

Teachers' Notes

Maths Content

Key Stage 1

The Strange Case of the Calculating Mr One has been developed to support the teaching of numeracy in schools at Key Stage One and to reinforce much of the mental calculation work tested in at the end of Year 2.

The main focus of the play is on the variety of methods available for problem solving and how to identify which is the most appropriate for the problem presented. Along the way we encounter number patterns, times tables and a selection of different techniques we can usefully employ to achieve this.

Each mathematical idea is built upon throughout the play involving the audience directly in both the calculations and the methodology employed in problem solving and encouraging them to use a variety of approaches to achieve a single answer. Throughout the play the work is put into a number of everyday contexts through which the problems are explored.

The following pages provide a summary of the work covered and examples of how it is put into practice in the play. On a separate web page you will find a pupil worksheet designed to tie in with the mathematical concepts covered in the play which can be photocopied for use in the classroom.

ORDERING NUMBERS

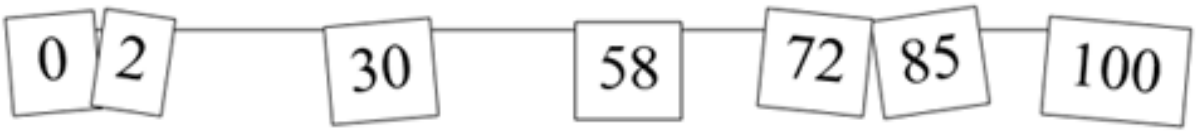
Initially, we introduce the idea of digits making up numbers by counting pennies from a piggy bank into tens and units. We find we have two lots of ten and two units giving us the number 22, thus 22p.

Moving on from this, we show that a number, such as 58 is not the same if the order of the numbers is reversed: 58 does not equal 85.

We then introduce a 100 number square and the two numbers made up from the digits 5 and 8 are located on it. From this we can see which is the bigger number. We learn that 58 has five lots of ten in it, but 85 has eight, and we can see on the square that the 58is much nearer to zero than 85..

THE NUMBER LINE

We now introduce a number line. We place 0 at one end and 100 at the other and we ask the audience to position various numbers in their correct place on the line. We start with 58 and 85, and ask the audience with would be closest to the middle. We then position 30, 2 and 72 looking at the units and tens that make each number up.



ESTIMATING

We introduce estimation as tool to approximate an answer; to give a guide to the final answer of a calculation or to check it after a calculation has been made.

We set the problem: a jar contains a number of wine gums. How many are there in the jar? Kitty, our heroine, starts by counting how many wine gums there are in one spoonful. She counts 5. She then estimates how many spoonfuls there are in the jar and decides that there are 4 spoonfuls, making a total of 20 wine gums. Then she asks Mr. Piggy (the Piggy Bank!) how many he thinks are in the jar. He thinks there are 6 spoonfuls making a total of 30 wine gums. Kitty asks the audience which answer they think is nearer to the actual amount and they then count the wine gums in batches of ten to get the exact answer. She has two lots of ten with seven left over, making 27.

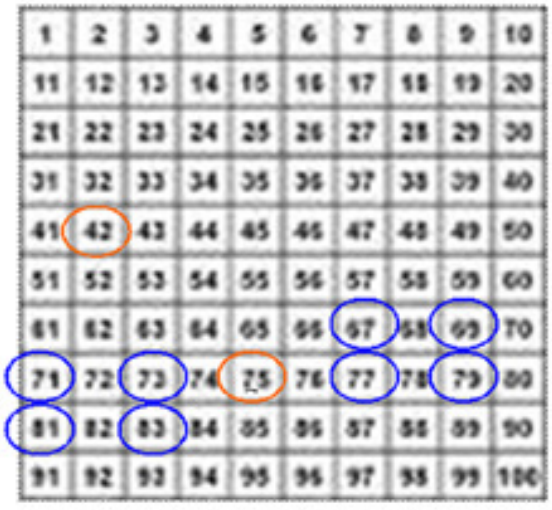
30 is nearer to 27 than 20 so Mr Piggy was the nearest!

COUNTING ON

Counting on and back is introduced from its very basic meaning of counting on one from any given number or counting back one. The concept is extended by counting on in twos and back in twos from a given number using a number square. Finally we introduce a number line to show how basic calculations can be solved by counting on in chunks eg. tens and then by counting on in units.

Kitty re-introduces the 100 number square to demonstrate what she means by 'Counting on' and 'Counting back'. A number is picked at random on the square and Kitty asks the audience to count on one square from the number and then count one square back. She then picks another number and with the audience she uses her number square to count on in twos, then to count back in twos. A new calculation is then introduced:

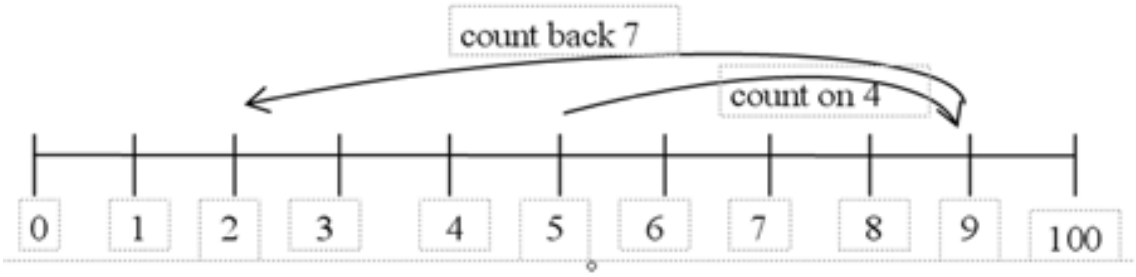
4 + 5 - 7 = ?



This time Kitty decides to use a number line. She begins the calculation by rearranging the sum. Thus she has:

5 + 4 - 7 = ?

Using her number line she counts on four jumps from 5 to 9. She then takes away the 7 by counting back seven jumps from nine, giving her the answer 2.



Another calculation is set up, this time with two digit numbers:

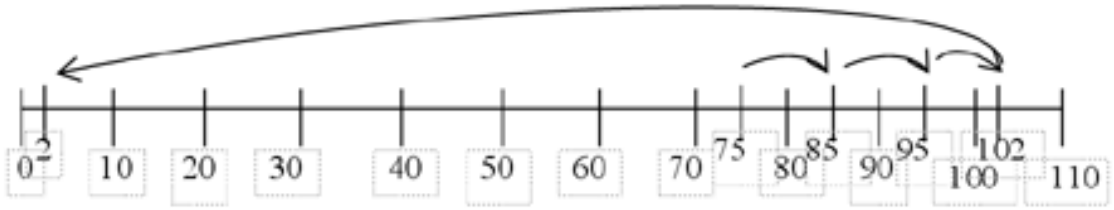
27 + 75 - 100 = ?

Kitty again begins by re-arranging the addition to put the bigger number first, thus she has:

75 + 27 - 100 = ?

Using a number line she counts on in tens from 75 to 95, encouraging the audience to join in. Then she adds the units by counting on 7 from 95 to 102.

She now needs to take away 100. This time she counts back in one giant leap of 100 to reach the answer 2.



These two calculations are part of a clue that must be solved in order to find the missing calculating machine.

PARTITION… BREAKING NUMBERS UP!

We introduce the idea of partitioning numbers as a useful tool for mental calculation. By dealing with the tens and units separately we show how a double figure subtraction calculation can easily be solved mentally without using a number line.

Mr Bloodhound has £99 and owes £85 in bills. He needs to find out how much money he will be left with after he has paid off his debts. He decides to partition his numbers:

99 - 85 = (90 - 80) + (9 - 5)

He begins with the tens: ***90 - 80 = 10***

He then deals with his units: ***9 - 5 = 4***

So he is left with ***10 + 4 = 14***
He concludes that 99 - 85 is 14 and that he therefore will be left with £14.

LEARN YOUR TABLES….

Mr Bloodhound visits the great inventor Ebenezer Brainteezer who has invented the calculating machine. With the help of the audience Mr Brainteezer and Mr Bloodhound chant the multiples of 2, 10 and 5:

2 times table: *2, 4, 6, 8, 10, 12, 14, 16, 18, 20*
10 times table: *0,10, 20, 30, 40, 50, 60, 70, 80, 90, 100*
5 times table: *5, 10, 15, 20, 25, 30, 35, 40, 45, 50*

Mr Bloodhound always has trouble remembering his tables so Ebenezer tells him to learn the patterns and, using a hundred square, he demonstrates the patterns made by the 2s, 10s and 5 times tables.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Knowledge of your tables is vital for multiplication and division calculations and an understanding of multiples as factors helps solve problems quickly.

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…..AND YOUR NUMBER BONDS

Just like knowing your tables it is very useful to know your number bonds for any mental calculations and we start by looking at number bonds adding up to 10.

Bassett, Mr Bloodhound's maid, explains that they are pairs of numbers that make 10, such as 8 add 2 and 6 add 4 etc. She holds up a series of numbers and the audience are encouraged to shout out the number bond in each case to make 10. She holds up the following numbers:

5 + ? = 10, 3+ ? = 10, 4 + ? = 10, 1 + ? = 10, 3 + ? = 10

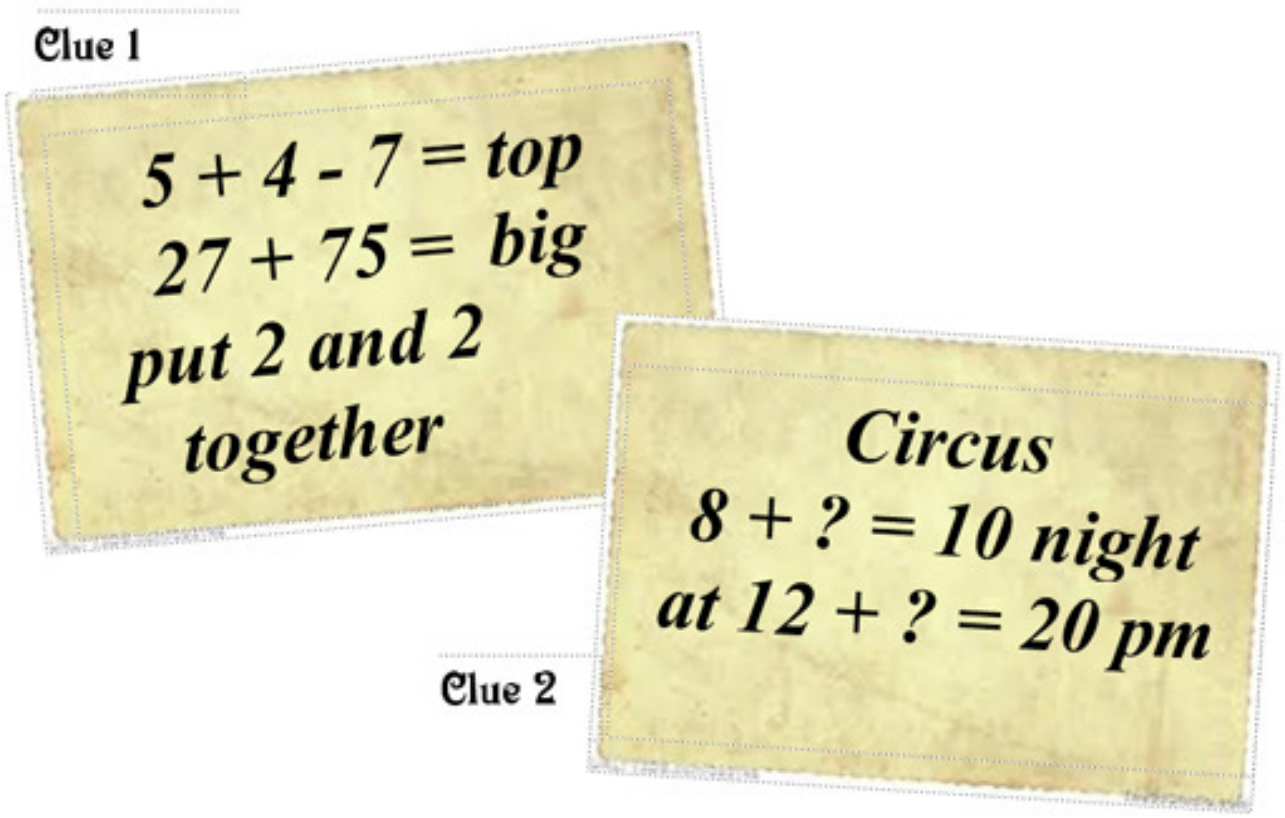
She then tries the audience on some number bonds up to 20:

18 + ? = 20, 10 + ? = 20, 5 + ? = 20, 7 + ? = 20?

She then uses her number bonds to solve a clue to the mystery of the missing machine

CLUES

There are two mysterious clues that need deciphering and with them come some mathematical calculations.



IT'S ALL IN THE METHOD……

And finally, here are the words to Kitty's song which is sung many times throughout the play:

It's all in the method
The method's all in all!
To calculate there isn't just one way!
Why not try some 'counting on'
But you must adjust your sum
And from the biggest number count away.
With subtraction and addition
It's good to try 'partition'
Split your numbers into tens and ones.
And another way to trust
Is to round and then adjust
Or doubling or halving can be done.
And don't forget to brush up on your number bonds and tables
And the world of calculation will be effortless and fun!

See how much you can remember in class……..