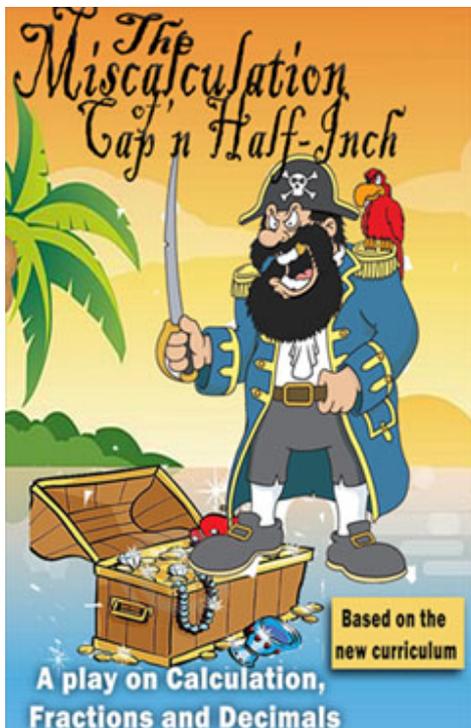# Teachers' Notes K S1

The Miscalculation of Cap'n Half-Inch

Our play has been written to support the teaching of numeracy in schools at Key Stage One and to reinforce much of the number work tested at the end of Year 2.

The main focus of the play is on ordering numbers, place value and the four functions including work with a number line and hundred square. Each mathematical idea is reinforced throughout the play by involving the audience directly in both the calculations and the methodology employed in problem solving.

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.

PLACE VALUE

The play begins in 'The Four Functions', the inn run by Pip Quarterly and his father. Trade is poor and they have far too much stock for the number of customers that come their way. Pip and his father look at how many bags of crisps they have unsold.

We introduce the idea of tens and units and show what we mean by counting the bags of ready salted crisps Pip's father has at the bar into two lots of ten and three single bags – so two tens and three units and we show it is written like this:

23 – two tens and three ones

Pip and her father then look at how many bags of each flavour they have left:

Ready salted - 23

Salt and vinegar - 16,

Cheese and Onion - 52

Roast chicken - 85

Smokey Bacon - 10

Cheesy Feet - 6

Pip then decides to play a game of 'biggest and smallest' and, using six volunteers from the audience, he puts them in order from smallest to biggest. With help from the audience Pip looks at how many tens and units each number

is made of to see what order they should be put in: 6, 10, 16, 23, 52, 85

ADDITION

We look at three simple addition calculations using 'breaking number up' or 'partition' to solve the problems.

Pip and her father decide to see which type of crisps they have the most of, cheesy ones, salty ones or meaty ones.

First they add the cheesy ones, so that's

52 + 6 – we have five tens in 52 and two ones,

so all we do is add the six ones from the cheesy feet to the two ones from the cheese and onion to get eight ones, and with the five tens the answer is 58.

Next they add the meaty ones:

85 + 10 – we have eight tens in 85 and five ones

> So this time we just have to add the tens together, eight add one is nine so we have 95

Finally they add the two salty varieties:

23 + 16 – this time we are going to have to partition both numbers into

> tens and ones and add them separately.
>
> There are two tens and three ones in 23, and there's one ten and six ones in 16. Now we add the tens together   2+1=3 tens Next we add the ones together 3+6=9 ones. We then add them together and get 39.

So the salty varieties are the most popular as there are the least number of bags of salty crisps left.

SUBTRACTION

We use the same methods – 'breaking numbers up' and 'partition' - to work out three subtraction problems.

The local Lord of the Manor, Lord Whole-Heartedly, is keen to know how much treasure the pirates have stolen. He knows how much treasure was on each of three boats and how much was left on the boats after the pirates had raided them but to find out how much the pirates stole he must take what remained away from what the boats started with. We set up these problems:

The Royal Oak. 97 gold bars and all were stolen except 5.

> *To work out how many gold bars the pirates stole we need to take 5 away from 97. Just like adding we break our number up: 9 tens and 7 ones and then take 5 ones away.*
>
> *So 97-5 = 92 gold bars*

H.M.S Victory. 88 gold bars and all were taken except 30.

> *This time we need to subtract the tens. There are 8 tens and 8 ones in 88 and we need to take the three tens, from the thirty, away from that 88.*

8-3 is 5.   So 88-30= 58.

From H.M.S. Victory they got 58 gold bars.

𝒯𝒽𝑒 𝒞𝓊𝓉𝓉𝓎 𝒮𝒶𝓇𝓀. *48 gold bars and all taken except 32.*

With this one we'll need to partition both numbers. There are 4 tens in 48 and 8 ones.   There are 3 tens in thirty two and 2 ones? We start by subtracting the tens. 4-3 =1.   Now the ones.   8-2=6.   Add them together 10+6=16.

NUMBER PATTERNS/TIMES TABLES

Using a number square we look at the patterns made by our 2, 10 and 5 times tables

THE TWOS
Lord Wholeheartedly needs 18 bottles of Red Rum and they come in boxes of two. This introduces the two times table and the twos are all the even numbers. Pip shows the audience on a Number Square and we chant the table: One two is 2, two two's are 4 etc. up to 12 twos are 24.   We see on the number square that the pattern is every other number or all the even numbers.

We still haven't worked out how many boxes we need for 18 bottle of Red Rum, but looking at the two times table we see 9 twos make 18, so if there are 2 bottles in each box we will need 9 boxes.

THE TENS
Next Lord Wholeheartedly needs 60 Pork Pies and they come in boxes of 10. So for this one we'll need our 10 times table.   We chant the table: one ten is ten, two tens are 20 ….ten tens are 100. We find we have come to the end of our number square, but ask the audience if they know what 11 tens would be - 110. And 12 tens - 120.   We show the audience that all the numbers in the tens times tables end in a nought.

So how many boxes we need of pork pies? If there are ten in a box and we need 60 pork pies in all we need 6 boxes

We run through the tables one more time.   one two is two, two twos are..etc.. one ten is ten, two tens are twenty…

THE FIVES

This time we are looking at the fives. Again, it's easy to see the pattern on a number square and we chant: one five is 5, two fives etc… up to twelve fives are 60. So the pattern goes 5 then 10, 15 then 20 etc.

If there are five bottles of rum in a box how many boxes would the captain need if he wants 25? We see from our tables it's 5 because five 5s are twenty five.   We ask the audience if we've got nine boxes how many bottles have we got? 45. And we do the five times table one more time.

EQUAL SHARE. FRACTIONS.

Pip explains to Lord Wholeheartedly that if you split something, like his pie, into two equal parts each person would get a half, and if we were to write it as a fraction we would write it like this.

one-half

$\dfrac{1}{2}$

The bottom tells us how many parts something is split into. In this case two parts.
The top tells us how many of those parts there is one.

If we wanted to give a slice of the Lord's pie to a member of the audience as well we would have to split it into thirds.   There are three parts and we are having one part each. We would write it like this: 1/3


$\dfrac{1}{3}$
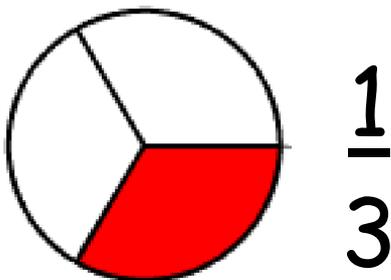
One third

We then ask the audience how many segments would we need to colour in to show two thirds? The answer is 2. And we show the audience how to write it (2/3).

The pirate have split the treasure into four – a quarter going to each pirate. And we ask the audience how much we would need to colour in to show a quarter. The answer is of course one segment.

$$\frac{1}{4}$$

One quarter

Cap'n Half-Inch wanted more than his share however, he wanted two quarters. We ask how many segments do we need to colour in to show two quarters and we see that it's the same as a half!
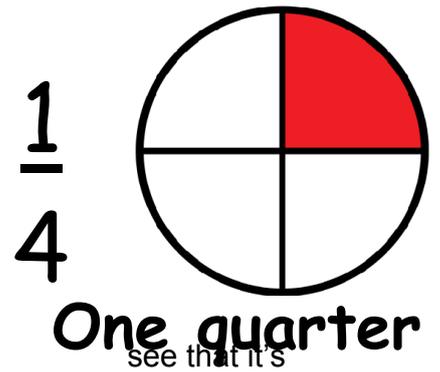
AT THE END OF THE SHOW.

Once the performance is over the actors will come out and do a ten minute Q&A with the children, checking the mathematical concepts have gone in and then throwing the questions open to the audience, where they can ask anything they like about what they've just seen – the content and how the show is put together.