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Introduction

Hello! We hope you enjoy using this book and that the ideas in it help add to your toolbox of resources for teaching mathematics. This revised edition also includes a CD resource exploring the history of numbers.

About the series

The main idea behind *Using Stories to teach Maths Ages 7 to 9*, is to provide a way of looking at the maths that the children have to learn in school, from a fresh angle. This means that their learning can be enhanced by looking at maths ideas in different ways. Using the stories can be a fun way of helping the children with their learning and their revision. It also helps children to understand maths by encountering it in different contexts, such as the imaginary situations in the stories and in real-life situations. Every different way in which a child (or an adult!) comes across a maths concept, enhances a child's ability to learn and understand the concept and to remember it. The age categories we have put each story in are of course only a guide – as all children are different and they can be of interest and use to older or younger children using the same or different contexts.

By making maths fun, the barriers to learning that they often create (“I can’t do maths”, “maths is boring” or similar phrases that they may have picked up from others) can be dissolved and the children gain more confidence and facility to understand and use mathematical concepts. This can lead to a far more positive approach and attitude to the rest of their mathematical learning. Having used these stories and poems in many schools around the UK, we are confident that the children will enjoy engaging with them and learning from them.

Inevitably, over the years, the maths curriculum has changed and been modified. However, as the core skills and concepts children need to learn at any age are essentially the same, we have been able to link the stories to the new curriculum. For this reason we hope that the stories and poems can provide a resource for initiating or supporting work to cover the Programmes of Study for each year group.

Therefore, in the teachers’ notes accompanying each piece we quote the Programmes of Study and supporting Notes and Guidance specified within the new curriculum. In the teachers’ notes we also suggest follow-up work, often incorporating worksheets or the illustrations that accompany the pieces, which you can use to create a whole lesson, or several lessons, around each piece. Of course, suggested lesson plans are only a guide and so

you can pick and choose the suggestions and ideas that will work best in your school, with your class etc.

Reading the stories

When you read the children the story, we recommend that you read them the story twice. The first time as a story in its truest sense – a story they can listen to and enjoy as a piece of narrative, without it being broken up and dissected as it’s told. Hopefully the enjoyment they get from the story will enhance their enjoyment of the mathematics they are learning.

However on the first reading of the story, they may have been so involved in the plot etc that they miss some of the maths ideas that are used in the story. So on the second reading you can get the children to focus on the maths ideas that weaved into the story by stopping at the points where a new concept enters into the narrative and discussing its role in the story, using an enlarged copy. This also means that the children will be able to enjoy seeing – and learning from! – the illustrations as well and many of the children will enjoy reading the story with you.

Using the lesson plans

Within the planning we have added reference statements headed **WALT**, **WILF** and **TIB** as these or similar systems are often used to ensure lessons are focused, objective led and in context for the learner. They help summarise the purpose of the lesson, what is required of the children in order for them to successfully learn that lesson and why what they are learning is important.



WALT stands for “We Are Learning Today.”



WILF stands for “What I’m Looking For.”



TIB stands for “This Is Because.”

The worksheets are designed to support the learning the children are making in mathematics. We recognise that completing them will often require literacy skills, which in some cases the children will not have at the required level. In order that the work remains focused on mathematics we suggest that you or your classroom assistants etc. scribe for such children so that their capability in mathematics is not held back by specific difficulties with literacy.

Round up rebellion

Links to curriculum

Year Four

Number – number and place value

Round any number to the nearest 10, 100 or 1000.
(PS)

Solve number and practical problems that involve the above and with increasingly large positive numbers.
(PS)

Background

This story is about rounding to the nearest 10 or 100, so either before or during the story you will need to explain how this rounding up is done. We suggest below several points you could discuss with the children about rounding numbers which the story introduces.

We also suggest that the children could either follow up the story by writing or creating their own versions through drama work and we describe two possible "Round Up Games" one of which could be played as a kinaesthetic session in the hall and one in a quiz style format in the classroom.



"About situations that occur in a funny story involving rounding numbers."

"To take an active part in class discussion thinking about how rounding numbers works."



"Rounding numbers can often but not always be a very useful thing to do."

Lesson plan

In the story, rounding up turns out to be disadvantageous to King Hundreds and King Tens – even though they both actually have bigger armies than King Units because of the way numbers are either rounded up or down.

The children could be asked to think of situations (writing their own stories or creating a drama presentation) when it's useful or – as in the story – unhelpful to round up. For example, it's very useful when you need an estimate of numbers quickly ("10 coaches all with about 40 people on them have arrived at our roadside caff – how many bags of chips do we need to get out of the freezer?") or to do rough calculations more easily. ("The wages manager is ill – I've got to get to the bank before it closes to draw out enough money to pay everyone, how much should I draw out? We've 30 staff who earn different amounts but we pay them all about £250 a week?")

As you tell the story, you could work out the rounded totals before they are revealed, which makes the learning more interactive.

Having read the story and reviewed it to make sure that the children can see who the rounding of the numbers was disadvantageous to, the children could be asked to see what might have happened if the three armies had had different combinations of numbers. Can they think of situations when King Tens would win or when King Hundreds would win?

The most confident children could be asked to imagine a fourth King – King Thousands and see what happens when the numbers of troops are much greater.

You could also ask them to work out what the numbers would have been if the kings hadn't wanted the numbers of the different types of soldiers to be given separately but the overall totals had been used.

You could also have a discussion about why we round numbers up when they reach five in the column we're rounding up. There's no logical reason why we should as it would be just as fair to round it down. Can the children think of any good arguments why we shouldn't round five up? Should we do it differently each time?

As part of this discussion you could reveal to the children our as yet undiscovered or properly appreciated rounding numbers system, which we

proudly call – “Steve and Simon’s Rounding Five Fortnights.”

This is how the “Rounding Five Fortnights” work*.

1. Everyday diary in the land records which day it is within a “Steve and Simon Rounding Five Fortnight”.
2. The first Monday of a “Steve and Simon Round Five Fortnight” is a rounding up day, so on this day if numbers are being rounded 5’s are rounded up. The next day, Tuesday, is a rounding down day and the pattern continues like this for the rest of the fortnight – the first Wednesday is a rounding up day, Thursday is a rounding down day and so on. Of course every second week that were rounding up days in the first week will be rounding down days and vice versa for the rounding down days.

*Brilliant, eh? So why haven’t we had a letter from the Queen or the PM yet agreeing to make every fortnight a “Steve and Simon Rounding Five Fortnight”?

You could use this to demonstrate and discuss how awkward it would be to randomly round fives up or down. Someone sometime decided that we must round up instead of down and so we do.

You could also ask the children what they think about the number of King Hundreds’ archers – 48 – being rounded down to 0 to the nearest 100. It does seem a bit odd that these 48 huge belching hairy men are discounted (sorry but they are belchy and hairy) from the numbers. Can the children think of a more suitable alternative – maybe a special rule for numbers less than 100 – but then what happens if there’s only three archers, that’s nowhere near 100!?!)

Along with the various discussions we suggest above – plus the idea of the children writing or dramatising their own versions, you could play a “Round Up Game.”

In a kinaesthetic version of the game you could place hoops on the floor, or mark off particular areas with posts where you have plenty of pace, such as in the hall.

Each area is labelled with a number, such as 30, 40 etc. The players are then told a number and then what they have to round it to the nearest of – e.g. 10 or 100.

Children who run to the wrong hoop/area are eliminated until a master-number-rounder is discovered. (Note: for the following lesson regarding sharing we’ve

also suggested a kinaesthetic idea, so you may want to plan to do them simultaneously.)

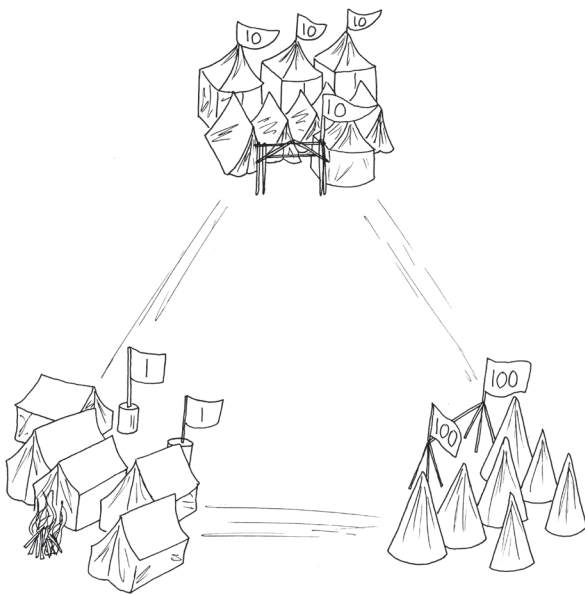
Alternatively the children could be split into teams and ask other teams to correctly round up numbers to the nearest 10 or 100 within a certain time. Correct answers gain a point; incorrect answers gain a point for the team asking the questions.

Resources

- (For “Round Up game” in the hall.)
- Hoops or posts to designate different areas, each marked with a number card e.g. 30, 40 etc.
- Large number cards – 10s and 100s.

Round up rebellion

There was going to be a war in the Land of Numbers! The three kings of the number kingdoms had had a quarrel about quadrilaterals. The three kings marched their armies to the Triangle Plain which had one side on the edge of each of their kingdoms. They each set up their camp on one corner of the huge triangle.



Because the three kings had got so furious over their quadrilaterals quarrel, they had marched straight to the Triangle Plain without bothering to count how many men they had in their armies that they had taken with them. So once they had set up their camps, they sent out their chamberlains to go and count how many men they had. They also sent out spies to both the other camps to see if the spies could find out how many men the other kings had in their armies.

When King Hundreds' chamberlain had counted their army he discovered that they had:

- 48 Archers
- 124 Cavalry
- 148 Infantry.

Now I think you'll agree that makes a total of 320 men if you add up all the numbers; a formidable force. But the chamberlain knew he couldn't tell his king exactly how many men he had in his army because he knew King Hundreds liked to have everything rounded up to the nearest hundred. (Especially now he was so angry with King Tens and King Units). So he had to round all the numbers for each group of men to the nearest hundred. That meant the chamberlain had to tell his king that his army was made up of:

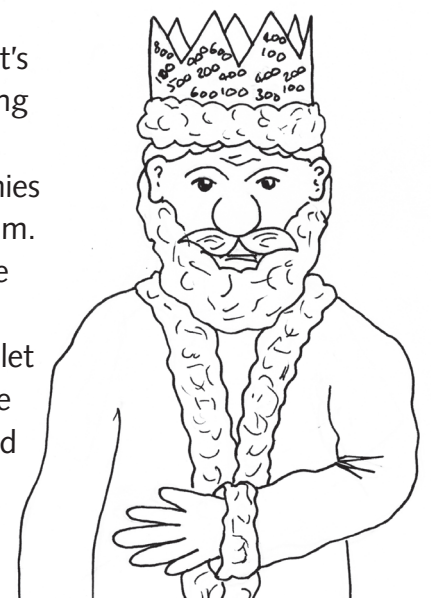
- 0 Archers
- 100 Cavalry
- 100 Infantry.

When the chamberlain told his king how many men he had the king went white with fear and then red with anger.

"You mean I've only got 200 men???" he bellowed.

"If you count each group to the nearest hundred, yes sire," replied his chamberlain, wishing his king wasn't so stubborn and that the king would let him tell him the exact numbers.

"Well, I only hope that's enough men," said King Hundreds, worrying whether the other armies had more men than him. "As soon as any of the spies get back from the other camps let me know what they've found out. Oh and find me some indigestion tablets if you can."



“Yes sire,” said the chamberlain as he backed out of the king’s tent, bowing. He knew exactly where the indigestion tablets were because King Hundreds always needed them even when things weren’t so serious.

At just about the same time as the indigestion tablets were setting to work in King Hundreds’ stomach, King Tens’ chamberlain was telling King Tens how many men he had. Having counted the men the chamberlain had discovered that they had:

- 34 Archers
- 113 Cavalry
- 114 Infantry.

Which makes 261 altogether, again quite a fair number of men. But this chamberlain knew his king would want to have all the numbers rounded to the nearest ten. So the chamberlain had to tell his king that his army was made up of:

- 30 Archers
- 110 Cavalry
- 110 Infantry.

Just as the chamberlain was telling the king these figures, the spies from King Hundreds’ camp had managed to sneak up to King Tens’ tent and could hear what was being said inside. They couldn’t see King Tens’ eyes bulging open in amazement and despair when he heard the figure from his chamberlain but they did hear him ask his chamberlain, “You mean to tell me I’ve only got 250 men??”

If the spies had stayed a bit longer they would have heard the chamberlain reply, “If you count each group to the nearest ten, yes sire,” but they were already off back to their camp, thinking they had good news for King



Hundreds. They knew they had more than 250 men in their army.

If the spies had stayed a little bit longer than a little bit longer they would have heard King Hundreds say to his chamberlain, “I’m getting a headache. I’m sure we haven’t got enough men. Let me know what the spies have found out as soon as any of them get back.”

“Yes, sire,” replied the chamberlain as he backed out of the king’s tent, bowing. He was going to head straight for the headache tablets without having to be asked, there was a huge box full of them in the supply tent, poor King Tens was always prone to headaches even when he had hardly anything to worry about.

At just about the time the headache tablets were slowly beginning to work away in King Tens’ head, King Hundreds’ spies had got back to their camp. They immediately told the chamberlain what they had heard – King Tens saying he had 250 men. But of course he knew he had to round up the number he’d been given to the nearest hundred.

By this time King Units' spies had finally reached the camp of King Hundreds (they weren't the fastest of workers – in fact they were downright lazy) and as they crawled up behind the king's tent they heard the king shouting. Actually he was shouting and getting very bad stomach ache but they couldn't hear the stomach ache of course. What he was shouting was:

“300 men??? 300 men??? Do you mean to tell me King Tens has 300 men????”

“Yes, sire,” replied the chamberlain having broken the news, “If you count their numbers to the nearest hundred, sire.”

“We can't possibly win then, we'll retreat before we're slaughtered by his superior numbers,” said King Hundreds. So the king retreated back to his kingdom with his 320 men and a very very bad stomach ache. They'd run out of indigestion tablets and he couldn't have any more until he got back to his castle.

Having waited around for King Hundreds' army to retreat, King Units' spies lazily sauntered over to King Tens' camp to see what they could discover there. (They were far too lazy to dash back to their camp to pass on the good news about one of their Kings' foes armies retreating.)

While all this was going on, King Units' chamberlain was finally telling his king how many men he had (the chamberlain was a slow, lazy, worker as well as the spies). King Units had:

- 33 Archers
- 110 Cavalry
- 113 Infantry.

In other words, 256 men and because, of course, King Units liked to be given figures that were completely accurate including the units, the chamberlain was able to tell King Units exactly how many men he had, which was lucky really because the chamberlain would have been far too lazy to round up the numbers anyway!

King Units was a bit worried when he heard these figures and just as he was starting to notice a sore throat coming on (which he always suffered from when he was worried), King Tens' spies sneaked into his tent, pretending to be servants cleaning the tent, they heard him say, “So that makes a total of 256 men,” to his chamberlain.

“... Yes ... sire...” replied the chamberlain after a lazy pause.

That was enough for King Tens' spies; they dashed back to King Tens' camp as soon as they finished pretending to clean the tent, thinking they would be bringing good news.



They knew there were more than 256 men in their army.

Meanwhile King Units' sore throat was getting worse. "Only 256 men, I'm sure that won't be enough," he said worrying.

"... Hmmm..." hummed the chamberlain, only just not quite so lazy that he couldn't be bothered humming.

"As soon as there is any news from the spies, let me know," commanded King Units. "And please get me some more cough lozenges."

"Yes, Sire," replied the chamberlain knowing that King Units never got any news as soon as it arrived and that the king's throat would probably have to wait quite a while before it was soothed by the lozenges.

While King Units was pacing up and down worrying in his tent, feeling like he had a bucket stuck in his throat, King Tens' spies had got back to their camp and told the chamberlain what they'd discovered – that King Units had 256 men. But, of course, King Tens' chamberlain knew he had to round up the number he'd been given to the nearest ten.

By this time King Units' lazy spies had finally reached the camp of King Tens. As they crawled up behind the king's tent, they heard the king shouting, just like they'd heard King Hundreds shouting. Actually he was shouting and getting a very bad headache but they couldn't hear the headache of course. What he was shouting was:

"260 men??? 260 men??? Do you mean to tell me King Units has 260 men???"

"Yes sire," replied the chamberlain having broken the news, "If you count their numbers to the nearest ten, sire."

"We can't possibly win then, we'll retreat before we're slaughtered by his superior numbers," said King Tens. So the king retreated back to his kingdom with his 261 men and a very very bad headache. They'd run out of headache tablets and he couldn't have any more until he got back to his castle.

Having waited around for King Tens' army to retreat, King Units' spies lazily sauntered back to their camp to pass on the news. If they'd known that their king was still pacing up and down his tent worrying and still suffering from his sore throat (the lozenges still hadn't arrived) they might have gone a bit faster... but then again they might not have.

Finally by the time King Units thought he had two buckets stuck in his throat, he got his lozenges and the news that the other two armies had retreated because their kings thought he had more men than he did.

"Thank heavens they had less men than us, I was worried that we might have less than them," said King Units, relieved at being able to stop pacing up and down and start sucking his lozenge.

So King Units' army marched victoriously back to their kingdom delighted that their superior numbers had put off the enemy. They marched very slowly because you might not be surprised to learn that as well as lazy spies and a lazy chamberlain...

The End