Solving Maths Problems For Years 1-2

By Anita Green

SECTION FIVE: ON THE FARM

The horses' paddock was next to the cows' paddock. Pop said he would take us out for a ride on the horses tomorrow afternoon.

7. Bailey counts 25 animals in the paddocks. How many horses might there be and how many cows?

As I wandered back into the hou_ I heard the cuckoo clock go an_ I think that was the fifth tim_ _ad heard it since I got up.

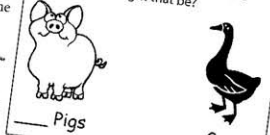**8.** What time might it be now and what time might B___ have got up?

Before __ left the __ _ _ really __gry! There were __o chick_ _ _ coops side __ side. Alt__ugh __ey __e same size, I noticed that there were 8 more chickens in one coop __ _ in the other.

4. __ many chickens might be in each coop?

On our way to feed the horses we passed the pigs and the geese. There were little piglets running around. I knew that Justin would want to take one home!

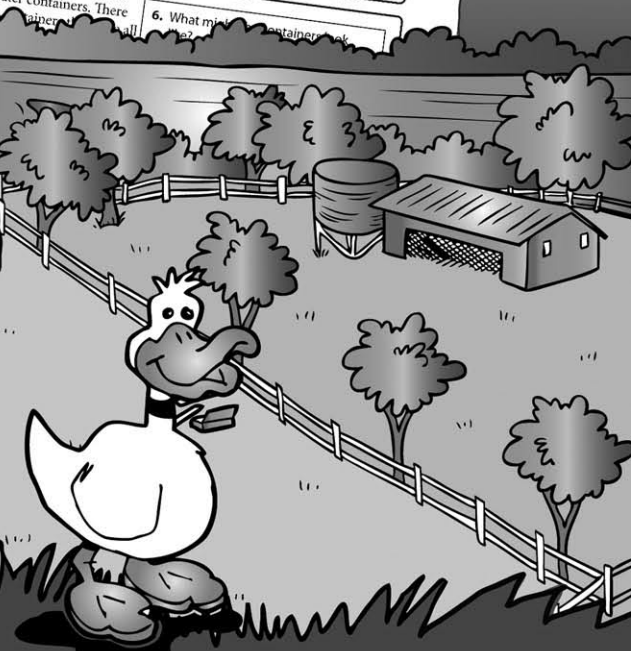**5.** Bailey counts 30 legs when looking at the pigs and geese. How many pigs and geese might that be?

___ Pigs

___ Geese

After we fed the horses we filled up their water containers. There were 3 big ___ainer___ __all

6. What mig__ __ontainer_ _ook

Contents

Sample

Teachers' Notes

This book contains a series of open-ended maths problems based on fun and engaging stories. The problems are placed into real life everyday contexts in which the students are likely to find themselves. It's important for students to know that open-ended maths problems have more than one answer and that students often need to add to the information to be able to solve them. For example, if the problem is: 'If I have 30 tablets, how many days will it take me to finish them all?', students need to decide how many tablets the patient is required to take each day, to work out how many days it would take to finish the course. They could work out answers for 1 a day, 2 a day, 3 a day, etc.

A benefit of using open-ended problems is that all students in one class, with their range of experiences and mathematical knowledge and skills, can be working on the same problem. This is because these problems can be solved using a variety of strategies, which means students can tackle them at their own level.

You will notice that the problems based on the stories have accompanying support and extension questions. This allows for further differentiation. If there are students who seem to be struggling with the main problem (this will often happen when you are first introducing these kinds of problems) it is a good idea to have a support question on hand for them to attempt first. In my experience usually once students have worked through the support question they are then ready to move on to the main question. The extension questions are there for the students who solve the main problems quickly to challenge them further.

Reflection time is important when implementing these lessons, not just at the end of a lesson, but also during it. It is important to stop at regular intervals and share how students are tackling the problems. This allows students to share successes and to learn about a range of different strategies. It also helps those students who may be struggling or are using a strategy that isn't working for them.

The questions that you pose during these lessons are also important. These questions can help students delve deeper and think more critically. For example:

- What would happen if…?
- Can you do it a different way?
- How do you know….?
- Have you found all the answers?
- How could you make this problem more challenging/easier? (This question encourages them to take responsibility for their own learning.)
- Prove it! Convince me!
- Can you show me/explain to me how you got your answer?
- Can you find a pattern?

All questions and activities are linked to the v8.1 Australian Curriculum. As Problem Solving is one of the proficiency strands, it is important that students are able to use all mathematical concepts that they have learnt in a problem solving situation. This book will also help to address Reasoning as students are required to show and explain their thinking and working out. Understanding may also be shown as students need to have some understanding of mathematical concepts taught, to be able to apply the knowledge to solve a problem.

AT THE PARK

v8.1 CURRICULUM FOCUS

Number and Algebra	Measurement and Geometry
Year 1:	
Develop confidence with number sequences to and from 100 by ones from any starting point. Skip count by twos, fives and tens starting from zero (ACMNA012) Count collections to 100 by partitioning numbers using place value (ACMNA014) Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015) Recognise, describe and order Australian coins according to their value (ACMNA017) Investigate and describe number patterns formed by skip counting and patterns with objects (ACMNA018)	Tell time to the half-hour (ACMMG020) Describe duration using months, weeks, days and hours (ACMMG021) Give and follow directions to familiar locations (ACMMG023)
Year 2:	
Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences (ACMNA026) Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting (ACMNA028) Solve simple addition and subtraction problems using a range of efficient mental and written strategies (ACMNA030) Recognise and represent multiplication as repeated addition, groups and arrays (ACMNA031) Recognise and represent division as grouping into equal sets and solve simple problems using these representations (ACMNA032) Count and order small collections of Australian coins and notes according to their value (ACMNA034) Solve problems by using number sentences for addition or subtraction (ACMNA036)	Tell time to the quarter-hour, using the language of 'past' and 'to' (ACMMG039) Interpret simple maps of familiar locations and identify the relative positions of key features (ACMMG044)

Discussion (before):

- ❑ Do you have a park near your house?
- ❑ Can you walk to it?
- ❑ Do you have a favourite park?
- ❑ What do you like about it?
- ❑ What sort of equipment do parks normally have?
- ❑ What do you like to play on at the park?
- ❑ What do you do at the park?

Discussion (after):

- ❑ What is your house number?
- ❑ What is the pattern of house numbers in your street?
- ❑ Can you put the house numbers into a different pattern?
- ❑ Take a photograph of your school's playground. Can you find different shapes?
- ❑ If I have 20 stones and I collected them during three separate trips, how many might I have collected during each trip?

AT THE PARK

SUPPORT & EXTENSION QUESTIONS

1. What do you think is the number of the first house in Chelsea's street? What do you think is the number of the last house in Chelsea's street? How many houses do you think are in the street altogether?
   Support: If there are just 10 houses in the street and the numbers go up in twos, what might the pattern be?
   Extension: What is the pattern? Can you create a different pattern for the letterbox numbers?

2. What might the temperature have been yesterday and what might it be today?
   Support: What if the difference is just 3 degrees?
   Extension: Tomorrow is going to be 13 degrees warmer than yesterday. What might the temperature be tomorrow?

3. How do you get to your closest park? Can you draw a map and show the path that you take?
   Support: Draw a map of your local park. What sort of play equipment is there?
   Extension: Write out a set of directions that someone could use to get to your local park.

4. How many ants do you think Chelsea can see?
   Support: How many legs are there on 3 ants?
   Extension: Can you work out how many legs there are on 8 ants?

5. Draw what the pattern might look like.
   Support: What might the colour pattern be if there are red, blue and yellow beads?
   Extension: Create three different patterns. Give your most difficult pattern to a friend and see if they can complete it.

6. How many beads might be in each group and how many beads is this altogether?
   Support: If there are 12 beads altogether, how many are there in each group?
   Extension: Can you find all the numbers from 20 to 40 that can be divided into 3 equal groups?

7. How many legs do you think there might be?
   Support: How many legs are there on 5 dogs?
   Extension: At first Chelsea counted 46 legs, but she knew that couldn't be right. How does she know that she wasn't right?

A MATHS STORY - AT THE PARK

Read the story *At The Park* and solve the problems along the way.

Dad and I decided to walk to the park. As we walked past the houses in our street I read out the numbers on the letterboxes, "24, …...26, ……28, ……30, ……32."

34!

"What number do you think will come next Chelsea?" Dad asked before we reached the next house. I thought about this. The numbers on the letterboxes were in a pattern. "34!" I said. As we strolled down the street I thought about the numbers on the letterboxes.

1. What do you think is the number of the first house in Chelsea's street? What do you think is the number of the last house in Chelsea's street? How many houses do you think are in the street altogether?

Chelsea's Street
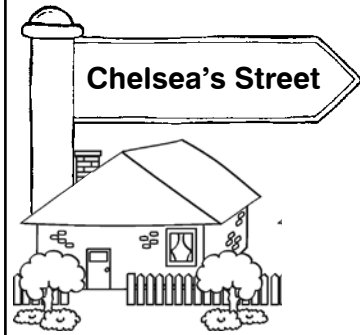
The weather was unseasonably warm! The difference between the temperature yesterday and the temperature today was 7 degrees!
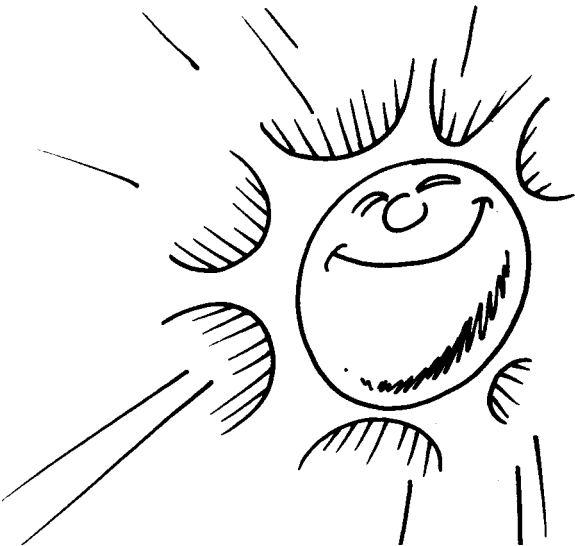
2. What might the temperature have been yesterday and what might it be today?

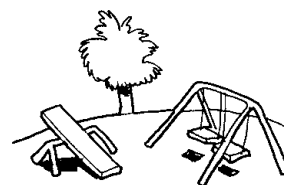| Temperature	
Today	**Yesterday**

It was a bit of a walk to get to our closest park. We turned left out of our house, took the next right and then the third left and the park was at the end of that street.

3. How do you get to your closest park? Can you draw a map and show the path that you take?

Your House

Your Local Park

When we finally arrived at the park, I ran straight to the slide and climbed up the steps. I slid down on my belly! As I hit the bottom of the slide I saw a row of ants climbing over a lolly wrapper. I could see more than 20 little legs!
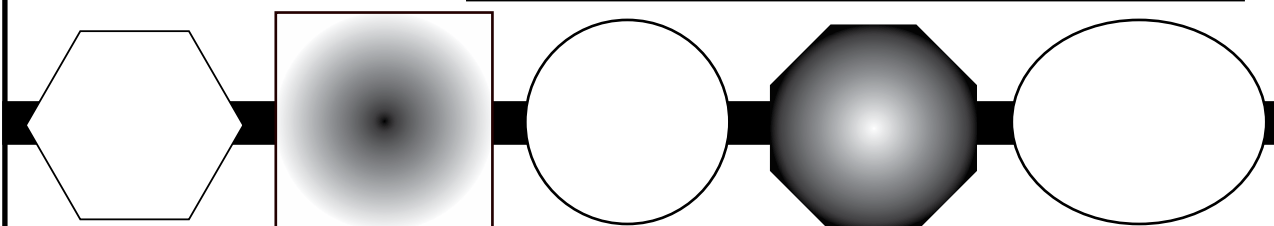
4. How many ants do you think Chelsea can see?

As I headed over to the swings, I passed counting beads attached to a long horizontal pole. The counting beads were all different shapes and colours. The beads made shape and colour patterns.

5. Draw what the pattern might look like.

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I pushed the beads all the way to the other side of the pole. Then I slid them back again. Then I moved some along the pole so they were in 3 equal groups.

6. How many beads might be in each group and how many beads is this altogether?

While swinging as high as I could on the swings, I watched as two people walked by each holding a bunch of leads. There were big dogs, small dogs, black dogs, brown dogs, short-haired dogs and long-haired dogs!

7. How many legs do you think there might be?
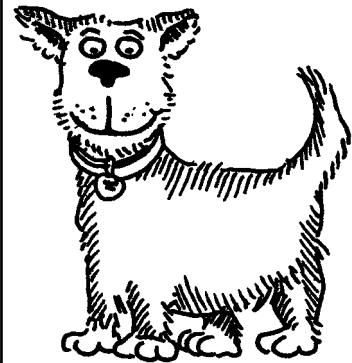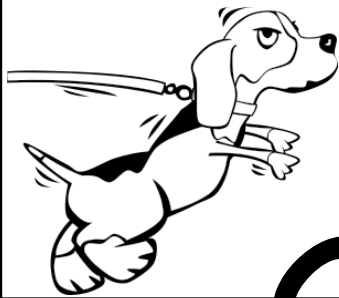
Next, I headed to the sandpit and decided to build something. I remembered that there were heaps of gumnuts along the tree line at the back of the park so I went to collect some to use in the sandpit. I collected as many as I could fit in my jacket and took them to the sandpit and then went back for a second pile. In the two piles, I had 30 gumnuts altogether.

**8.** How many gumnuts might Chelsea have in each pile?
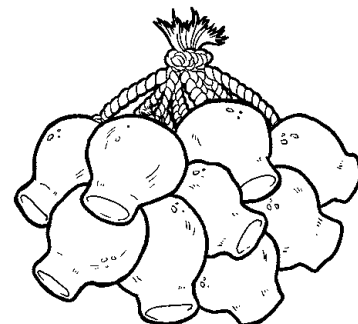
A MATHS STORY: TRANSPORT

Read the story *Transport* and solve the problems along the way.

"Smash!" yelled Jack, crashing his car into mine. Jack loved cars, trains, buses, trucks, planes ... he loved all methods of transport! I remember when we were in Jack's mum's car parked at the shops and Jack turned to me and said, "Did you know there are 24 wheels in this carpark?" I didn't know if he was right, but I was impressed that he had even attempted to count them!

1. If there are 24 wheels in a car park, how many vehicles might there be?
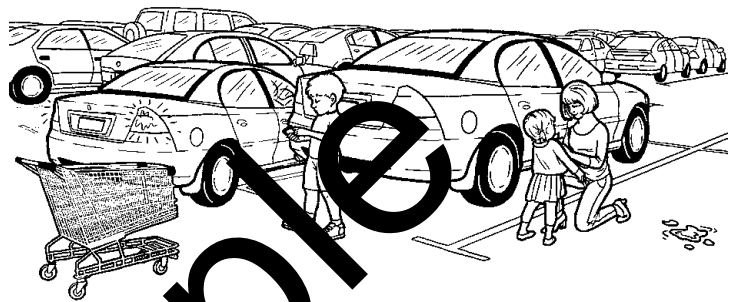
Jack and I were playing at the car track, Jack's favourite place to play at school. A few others were playing there too. Between us all we had 9 vehicles.

2. How many wheels might this be?

Jack's whole family loved cars and motorbikes. One day I went for a play at Jack's house and it looked like there were cars and bikes everywhere. Even Jack had his own little motorbike. I could just imagine my Mum's face if I asked for a motorbike!

3. If there are 30 wheels at Jack's house, how many cars and motorbikes might he have?

As we were playing at the car track, Jack ran off to get a car that had rolled away and I looked up at the cars driving past the school. I watched a few cars go by and then a minute later another group go by. By the time 10 cars had passed I realised they made a pattern!
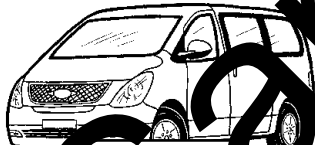
4. What might this pattern look like?

Once, our teacher, Mrs. Sander, had taken us out of school one day to collect some data on the colours of the cars that drove by. We had to create a tally for every red, blue, black and white car that we saw.

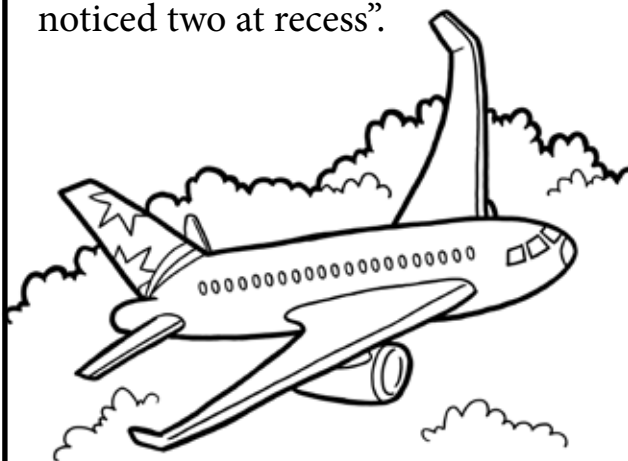**5.** What might this tally look like?
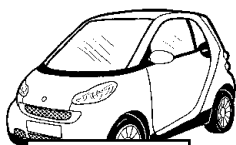
red   blue   black   white

Jack came back and pointed out a plane flying over us. "That's the second one I have seen since we came out to play," he said. "And I noticed two at recess".

6. Can you work out how many planes might fly over the school in one day?