Milestone Maths B1
by
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Milestone

For Joshua

My youngest son and the inspiration for this series.

Milestone Maths B1
First Edition (2024)

milestonemaths.com.au

Cover photo by Benjamin Sow on Unsplash
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Milestone Maths
Gin Gin, QLD
Australia

Parent's Introduction

Welcome to Milestone Maths, the mathematics curriculum designed especially for Australian home schoolers. This course has been developed with Australian home schoolers particularly in mind but will also be useful for after school study with or without a tutor. The series follows the Australian Curriculum (v 9.0). Level B corresponds to year 1 and this book is intended for term one, with four lessons per week for 10 weeks.

The course is gradual, systematic and thorough. Mathematics is a sequential subject where one concept is built upon another and thorough mastery of each step is essential for true understanding of the whole. This is reflected in Milestone Maths by presenting new topics sequentially and in a manner that builds from the known to the unknown. Review is built into the program and the needs of students with different abilities are catered for by pacing guidelines and supplementary practice activities.

Resources

Besides the student books, the only essential resource for this curriculum is a set of Sumstix (also known as Cuisenaire rods). These may be purchased from the place where you obtained this book. Visit the following link for details:

www.milestonemaths.com.au/what-are-sumstix/

Occasional lessons will require simple resources that you should already have around the house. It would be a good idea at the beginning of each week to have a quick look over the lessons for the week to see if any aditional resources need to be prepared. This will usually be the only preparation required on your part.

Placement and Progress

To begin at level B a child should be able to count to 10 and recognise the written numbers 1-10. They should also be fairly confident at counting out a given number of objects from a larger collection, although this will be reviewed and reinforced. They do not need to be able to write the numbers.

While it is impossible to make one fixed series of lessons to meet the needs of all students, this series is designed to be flexible enough to fulfill the needs of the majority of students. With this in mind, please note that you do not need to finish the entire "B" series in exactly one school year. If your child is finding the concepts easy, you may consider doing two lessons in one day and conversely, if the subject matter is more challenging, break the lesson up across two or more days. Lessons or activities marked with  a graduation cap icon are advanced and are included to challenge the more motivated/talented students. Advanced material will usually become 'mainstream' at some point later in the course.

Importance of Practice and Drills

The importance of the drills cannot be overstated. In my tutoring practice I have seen several students who began to struggle in mathematics from year 5 transformed into "A" students in high school after only one to two years of intensive drilling on the times tables. If the habit of daily practice on the basic facts of numbers is established early, a plethora of problems and struggles will be avoided later on. In this level the drills form a part of each lesson from lesson 41 (Student Book B2) and are labeled with an hour glass icon.

If you or your child prefer a more interactive and social approach to achieve the same goal, consider using flashcard drills. Most children will benefit from doing both written drills and flashcard drills. I recommend using flashcards as a warm up activity. This will leave some 'space' between the flashcard and written drills. This type of "spaced repetition" is an excellent way to efficiently learn a new skill or to memorise information.

What are Milestones and Checkpoints?

A Milestone corresponds to a chapter or unit of work. In the student book, the start of each Milestone is marked with a picture of a milestone and the milestone title. Checkpoints are end of chapter reviews and are essentially lessons dedicated to review and practice of the key concepts and skills introduced in the Milestone. If your child has particular difficulty completing a checkpoint, it is recommended that you spend some time reviewing the concepts taught in the Milestone before moving on. If they have difficulty with only one or two activities, review the concept imediately and make a note to practise those skills often during the introductory phase of subsequent lessons until the skill is mastered.

The child should be able to complete each activity in a checkpoint lesson independently, or with minimal help, after you have read the instructions. At this level the child may use Sumstix as much as they need to while completing checkpoints, lessons and drills, although they should be encouraged to transition to completing the drills without assistance.

Adaptations for Children with Special Needs

If your child has special learning needs, there are a number of adaptations possible.

For older yet illiterate students: you should read all instructions to the student just as you would to a young child that is still learning to read.

For children who have difficulty writing: you may act as scribe and have the child tell you what to write. When numbers or equations are required, have the child "build" the answers using the number and game flashcards. Also, use the number bond flashcards for drills instead of the written drills until writing is easy. Unless the child has a physical handicap that makes writing difficult or impossible, I would suggest that you gently encourage them to do more and more writing on their own every day. Begin by taking turns with the pencil - you write one number then the child writes one, etc and slowly increase the amount of writing that your child does until they achieve independence.

For children who need a slower pace: some lessons could consist entirely of warm up/review activities or the student book activities could be assigned over two or more days.

Extra writing practice can be done on a reusable drawing board (eg whiteboard, LCD tablet, etc.), on scrap paper or in a separate exercise book.

For children who need a faster pace: If your child is finding the lessons very easy and is learning the concepts quickly, you may consider doing two lessons a day and completing the Review and Practice section of only one of the lessons. Special care needs to be taken that the child is mastering the drills at this pace as well. Over learning is always a good thing however, a particularly bright child will need to be challenged to maintain motivation.

Questions or comments?

If you have any questions whatsoever about any aspect of this course's implementation, or if you need help understanding any maths related concept, please do not hesitate to contact the author at author@milestonemaths.com.au

Parent Notes for Book 1

Milestone Maths B1 lays the essential foundation for all future learning in mathematics. The following concepts are introduced:

- Writing the numbers from 0-10.
- Counting backwards from 10 to 0.
- The number line.
- Counting on from a number.
- The idea that a number (or group) which we call a total can be broken into two smaller smaller numbers (groups) which we call the parts.
- How we use number bonds to represent addition facts.
- How we use Sumstix to represent the numbers.
- How we can use Sumstix to solve simple 2 digit addition problems with a total of 10 or less.
- How to use Sumstix to solve simple addition equations where one of the addends is unknown.

Milestones 1, 2, and 3 collectively form a single comprehensive unit of work. However, instead of presenting it as a single Milestone, it has been divided into three separate Milestones. This deliberate division allows your child additional time to grasp the information thoroughly and become familiar with checkpoints from the outset of this course.

A NOTE ON NUMBER REVERSALS

In children of this age group, it is quite common to reverse certain numbers while learning to write them. Specifically, they tend to confuse the direction of digits like 2, 3, and 5. This phenomenon occurs because our writing system imposes a constraint that contradicts the child's intuitive understanding of the visual world.

From a very young age, their brains learn to recognise their mother's face regardless of its orientation. Through numerous observations, they develop the idea that all objects exhibit the same pattern. For instance, a triangle remains a triangle whether it appears pointing up or down.

Numbers (and letters) contradict this pattern by imposing the constraint of fixed orientation. For many children this is a concept that takes a long time to learn. It is also very common for a child to write their numbers perfectly one day and then reverse random digits the next. Please do not become frustrated or scold your child for reversing their numbers. Children of this age group are usually trying their very best to please you so scolding them for an unconscious error will do much more harm than good to both the child and your relationship with them. Simply point out the error, erase the number and gently help them (guiding their hand if necessary) to write the number the correct way. With consistent and patient effort, number reversals will eventually disappear.

The best way to minimise number reversals is to spend much time practising number formation and stressing the correct formation of each of the digits. For example, insist that zeros be written in a counter clock-wise direction and that fives begin with a down stroke. Attention to detail from the outset will smooth the entire journey.

NUMBER RECOGNITION, WRITING AND SEQUENCING ACTIVITY SUGGESTIONS

Counting is the true foundation of all mathematics so it is suggested that at least one activity from each of the groups below be practised often, preferably daily, during the six to twelve months of learning mathematics. The activities should be adapted and extended to include the entire range of numbers that has been taught.

DIGIT RECOGNITION

Flashcard drill of the numbers: Shuffle number flashcards and have the child name the number on each card.

Match numbers to objects: Hand out a single set of 0-10 digit flashcards, shuffled. Have the place the cards in ascending order on the table then line up the corresponding number of counters (any small object) under/above/on top of each card.

Label groups with numbers: Place groups of 0-10 objects on the table and ask the child to label each one with the correct number card.

Match numbers to Sumstix: As above but replace the counters with Sumstix. One rod of the appropriate colour and length should be placed on each card. I.e. a white cube should be placed on the 1 card, a red rod should be placed on the 2 card etc. This can be extended to larger numbers once they are taught.

Look for opportunities to reinforce counting and number recognition skills: Outside of formal lesson time look for any and every opportunity to put counting and number to practice. Look for numbers on road signs or number plates. Have the child count out cutlery to set the table. Count family members, pets or toys etc.

NUMBER SEQUENCE

Learn and practice counting songs or rhymes like "One, two buckle my shoe." Search online for more.

Have the child sort a deck of number cards from smallest to largest.

Place number cards on the table in sequence but leave one out. For example, lay out the cards, "1, 2, 4, 5". Ask the child to tell you which one is missing.

Select a number at random and have the child count on from that number to 10, 20 or 100 (to their level).

Select and shuffle 5-10 number cards at random and have the child place them on the table in ascending or descending order.

Have the child make a large number line by pegging number cards to clothesline or s string suspended between chairs.

NUMBER WRITING

Have the child practice writing numbers from dictation in various media. Ideas to try: whiteboard, chalkboard, magnetic or LCD drawing board, using a finger in a baking tray filled with a thin layer of rice, polenta, flour or dry, raw ingredient, on concrete with chalk, in sand at the beach or in dirt with a stick.

MIXED ACTIVITIES

You can mix any of the above. For example:

- Shuffle a deck of number flashcards and use them to decide what number the child should write.
- Have the child choose a card from a hand that you present fanned out but facing you. Let the child write that number or count out that number of objects from a larger group.
- Select a random card or choose a number and have the child write that number and all the rest of the numbers in sequence to the next multiple of 10.
- Arrange toys in groups in a sandpit or on the beach and have the child write the number of toys in each group with a stick or their fingers.

Milestone 1

MILESTONE GOALS

By the end of this milestone, your child should be able to:

- Write the digits 1-7 from diction in any order without a model
- Write the sequence of numbers 1-7 without a model
- Recognise basic shapes: circle, triangle, square, rectangle
- Recognise which number the Sumstix from white to black represent. At this stage, this goal may still be developing and it is OK if your child needs to sort the rods and then count to find which number a particular rod represents.

SPECIAL TEACHING DIRECTIONS

Please ensure that you perform at least one activity daily from the section titled Number Recognition, Writing and Sequencing Activity Suggestions. Placing the shuffled cards in proper sequence is also an excellent daily activity at this stage.

Even if the child is able to "rattle off" the numbers to ten or beyond, this does not mean that they have truly mastered the sequence or that they have a concept of what the numbers actually mean so please do not dismiss these early lessons as unnecessary unless you are certain that they have mastered these skills.

Milestone 2

MILESTONE GOALS

By the end of this milestone, your child should be able to:

- Recongise a number line and label it with appropriate numbers from 0-10 as requested.
- Write the sequence 0-10 from memory.
- Find the missing number in a consecutive three number sequence.
- Find the number immediately before and after a given number.
- Recognise which number any Cuisenaire rod represents. Recognition of the longer rods may be developing.

SPECIAL TEACHING DIRECTIONS

LESSON 14

Sumstix and number cards are excellent tools to teach and practise the concepts taught in this lesson. Use two or more of the following activities as the introduction to the lesson:

- Find the Sumstix which represent the given numbers and then find the sumstix which fits between these two to form a mini-staircase.
- Sort a set of number cards and then find the two given numbers. The one in between will be obvious.
- When only one number is given you then find the sumstix either side of it in a stair case or the number cards either side of it in a sorted sequence of cards.

LESSON 15

The ability to count fluently in BOTH directions is an important foundational skill in mathematics. Encourage your child to count down from ten often. As the introduction to this lesson consider doing an art, craft or lego activity which involves making a rocket. Your child will likely enjoy counting down many times to send their toy "into space."

Milestone 3

MILESTONE GOALS

By the end of this Milestone, your child should be able to:

- Select the biggest or smallest number from a small group of random numbers.
- Order a few non-consecutive numbers in ascending or descending order
- Count back from 10 to 0. This skill may still be developing.

SPECIAL TEACHING DIRECTIONS

This short Milestone presents fairly straightforward ideas , however, your child will likely take some time to become fluent with the skills taught. The activities will be practised often in subsequent reviews throughout the four books of this level.

Use Sumstix and/or number cards to introduce the idea of comparing and sorting numbers to your child.

USING SUMSTIX

Find the sticks corresponding to the given numbers. The largest number will be the longest sumstix and the smallest number is the shortest sumstix. If you are required to sort the numbers, arrange the sumstix you found in order from shortest to longest or vice versa to match the question.

USING NUMBER CARDS

Find the number cards that correspond with the numbers given. Sort the cards from smallest to biggest. Finding the biggest or smallest number is then easy. If your child is still developing fluency with counting and sequencing of numbers it would be best to start with all the numbers from 0-10 and arranging these in order. You can then "pull down" the cards corresponding to the numbers given in the question maintaining the order.

Illustrating with Sumstix at the same time will help to reinforce this learning. Do this by finding the matching stick for each of the number cards that you have pulled down, and show the child that the shortest stick corresponds to the smallest number and that the longest stick represents the biggest number.

Milestone 4

MILESTONE GOALS

By the end of this milestone, your child should be able to:

- Understand the concept of breaking a total into two parts
- Be able to find a missing number in a number bond using Sumstix (working with numbers <10)
- Relate simple addition word problems to number bonds and Sumstix to find the solution empirically

SPECIAL TEACHING DIRECTIONS

This concept is key to understanding the duality between addition and subtraction which will simplify learning the addition and subtraction facts and prepare the child for algebraic concepts which will be encountered later.

LESSON 21

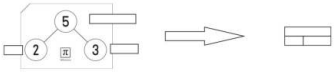
Before teaching this lesson consider presenting the idea to the child using concrete materials: any toy or counter will work. Start with a small number of counters (say 4) and have the child count them. Then "label" the group with the appropriate number card as most children have very short "working memories." Break the group into two smaller groups (eg 1, and 3) and label each group with the appropriate number cards. Arrange the number cards so that they look like the numbers in lesson 21 which is suggestive of a number bond. Repeat this a few times, before asking your child to break a group into two smaller groups. At first you may suggest how many objects should be in each group but you should aim to have the child make different groups on their own.

LESSON 22

This lesson presents the same concept as the previous one but the groups of objects are replaced with Sumstix. I suggest allowing the child to "experiment" with finding as many combinations of sumstix as they can to make a train the length of a Sumstix that you specify (4 and 5 are good numbers to start with but you may extend this activity all the way to 10). Have the child find the corresponding number cards to the patterns they build but only for a few of them as they will find the exercise tedious if they have to deal with the numbers too much at this stage. You can, however, ask the child to verbalise what they have built fairly often. So you can elicit from the child a statement like, "two and three make five," or "a two Sumstix and a three Sumstix make a five Sumstix."

LESSON 23

This lesson relates the Sumstix represenation of addtion to number bonds. If you have the Milestone Maths number bond flashcard system, select one card (with a total < 10) and place Sumstix next to each of the numbers in the bond, then group the Sumstix together to make the familiar pattern. If you don't have the flashcards, the same demonstration can be done by writing the number bond on a whiteboard or scrap paper. The demonstration is illustrated below:



LESSON 25

The concept taught in this lesson is fundamental to understanding subtraction, and more importantly, the relationship between addition and subtraction. Give a practical demonstration of the lesson by writing the number bond from the following example on a whiteboard and constructing the Sumstix pattern. Ask your child to find the rod that "fills in the gap." Repeat with different numbers as often as necessary for the child to understand the idea.

LESSON 26

Work through the example with your student. Show them that they should first find the Sumstix that correspond to the numbers given in the question. Show them how to arrange the Sumstix to reflect the other information given in the question. Point out that in this case we have two parts so the Sumstix should be placed end-to-end. It should be easy for the child to find the rod that is the same

length as the train they have just made. Finally, they can fill in the number bond and write the total on the line provided for the final answer.

Milestone 5

Milestone Goals

By the end of this milestone, your child should:

- Recognise and be able to write a basic addition equation.
- Understand the principle of commutativity of addition (A+B=B+A). They do not need to know the term "commutativity".
- Be able to use Sumstix to solve an addition equation with a total of 10 or less.
- Be on the way towards memorising the addition facts to a sum of 5.

Special Teaching Directions

With the foundation laid down in the previous Milestone, the lessons in this Milestone are fairly straightforward. The introduction of zero in addition is delayed until the end of the Milestone because it is a concept that can confuse children if introduced too early.

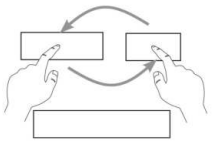
Lesson 31

The aim in this lesson is to have the child break up each group of shapes into two groups and then represent this using an addition equation. They can (and should) break up the shapes in any way that works. As an introduction you could do this with concrete materials (counters, buttons, coins, small toys etc) and a whiteboard. Take five counters and divide them into a group of 2 and a group of 3 then draw five shapes on the whiteboard and draw circles to group the shapes the same way as you did the counters. Finally write, "2+3=5" on the whiteboard. Repeat but this time break the group of five into groups of 1 and 4. Then swap the groups around to make the sum 4+1 and write this down.

Lesson 33

This lesson introduces the concept of commutativity of addition, that is the idea that A+B = B+A (we can add in any order). It is best illustrated with Sumstix which make the concept intuitive. Make up a Sumstix pattern that represents an addition equation. Then swap the order of the two shorter Sumstix and show the child that the train is still the same length. Tell the child that we will call the two equations they created "mirror sums" because they are similar but different. Some children like to say that the sums are "flipped."

3 + 2 = 5



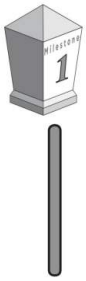
2 + 3 = 5

Hi! I'm Emmy Echidna and I'm here to help you learn maths.

Watch for me and I'll give you some hints and tips along the way.

And sometimes... I'll just be there to "hang out" with you!...

So, let's do some maths!

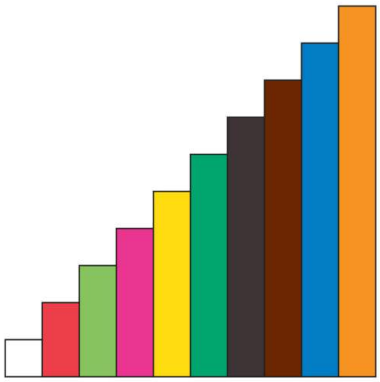


Lesson 1

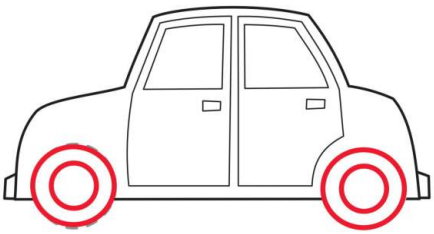
Numbers 0–10 Part 1

Trace and write

The picture below shows a Sumstix staircase. Build a staircase with your Sumstix then colour the picture to match.



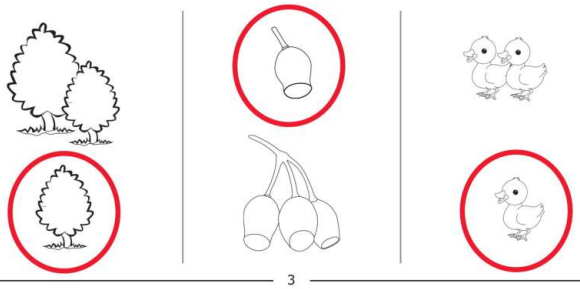
A circle has only one side and no corners. Trace and draw circles to complete the picture. Hint: both wheels should look the same.



Review and Practice

Practice writing the number 1.

Circle the pictures that show 1.



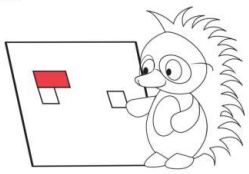
Lesson 2

Trace and write

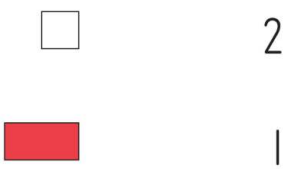
2

We can use the white Sumstix to measure the other Sumstix. Measure how many white sticks can fit next to a red stick (on the long side). Draw white sticks under the red stick to show how you did this. Write how many white Sumstix long the red Sumstix is on the line.

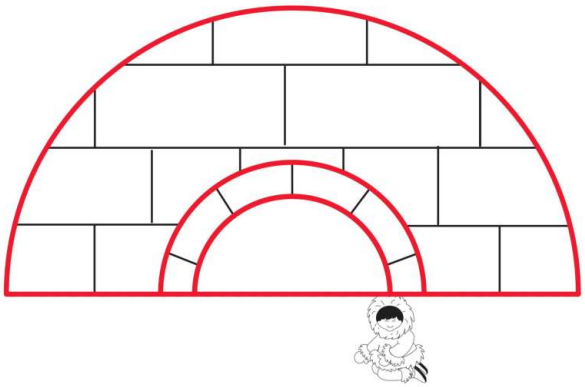
2



Match the Sumstix with the number that it represents.



A semi-circle has two sides and two corners. Trace the semi-circles.

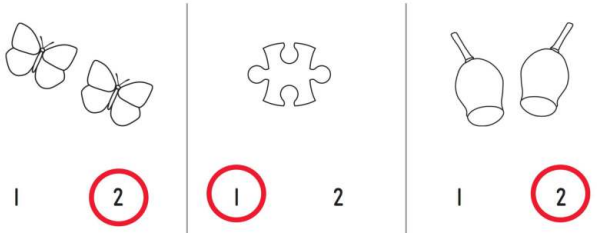


Review and Practice

Practice writing the number 2.

2

Count the pictures and circle the correct number.



Lesson 3

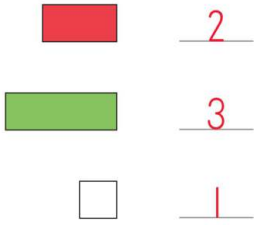
3

Trace and write

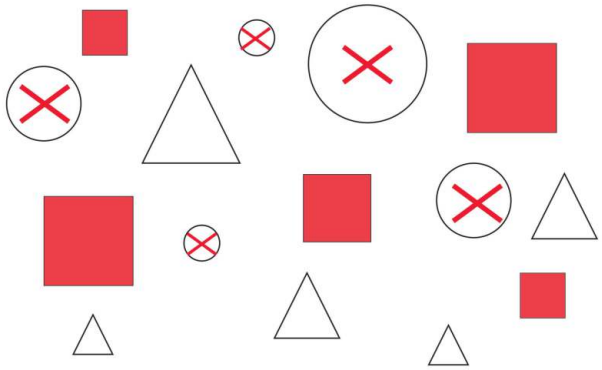
3

Find the Sumstix that is three white Sumstix long. Colour the Sumstix below to match.

Write the number represented by each Sumstix on the line next to it.



Colour the squares using your favourite colour. Draw an 'x' inside the circles. What do you call the shapes that are left? How many sides does one of them have?

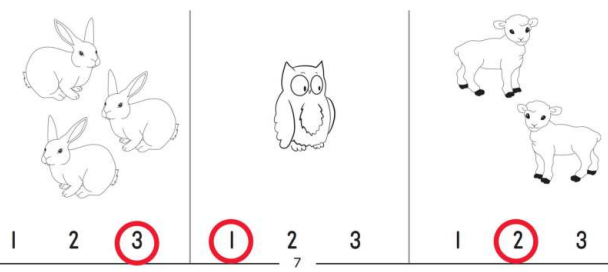


Review and Practice

Write the number sequence 1-3.

1 2 3

Count the pictures and circle the correct number.



Lesson 4

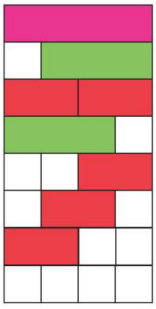
4

Trace and write

4

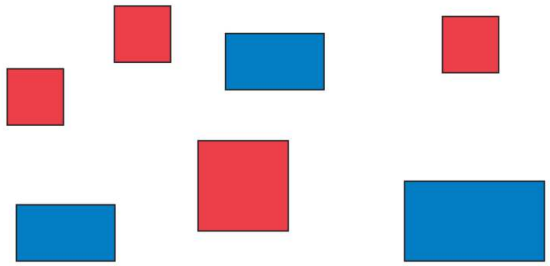
We make a Sumstix train by putting two or more Sumstix next to each other to make a longer shape like this:

How many sumstix trains can you make that are the same length as the pink (4) Sumstix? Draw them here:



I can find 7 trains. How many can you find?

Both squares and rectangles have four sides and four corners. Do you know the difference between them? All four sides of a square are the same length. Rectangles have two shorter sides and two longer sides. Colour or outline the squares red and the rectangles blue. Then count how many there are of each.



How many?

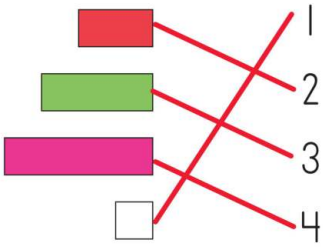
☐ 4 ▭ 3

Review and Practice

Write the number sequence 1-4.

1 2 3 4

Match each Sumstix to the number it represents.



Lesson 5

5

Trace and write

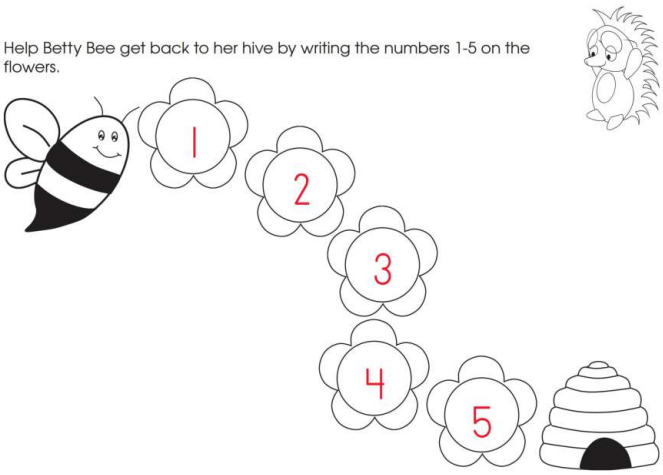
5

Find the Sumstix that is five white Sumstix long and colour the one below to match. Then find some trains that are the same length as the five Sumstix and draw them in the space below.

Parent to check. Any trains that are the same length as the yellow stick are fine. (See lesson 4 for an example.)

Review and Practice

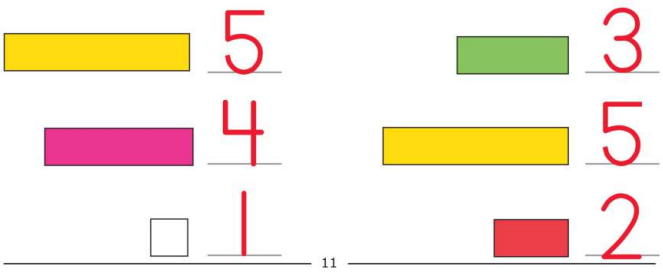
Help Betty Bee get back to her hive by writing the numbers 1-5 on the flowers.



Write the number sequence 1-5.

1 2 3 4 5

Write the number that each Sumstix represents.



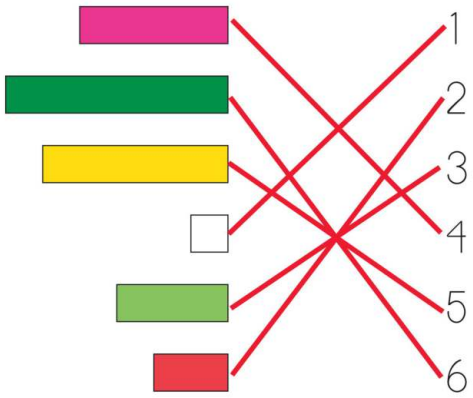
Lesson 6

6

Trace and write

6

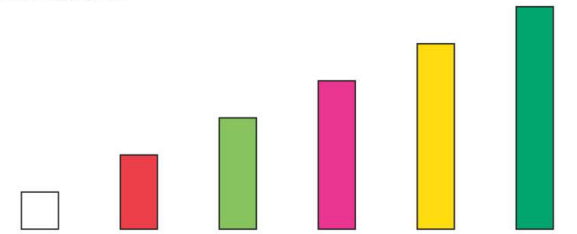
Match the Sumstix to the numbers they represent.



Build the trains shown below then draw and colour the Sumstix that is the same length as each train.

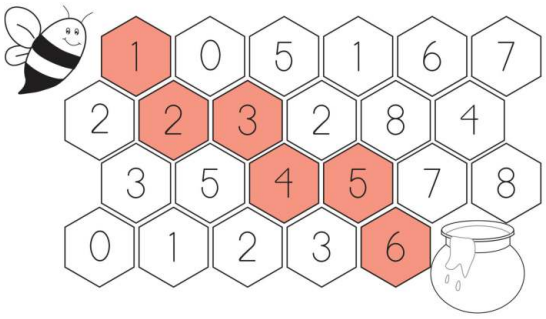
Review and Practice

Colour the Sumstix below to match real ones and write the number that each one represents underneath.



1 2 3 4 5 6

A shape with six sides is called a hexagon. Bees build their honeycomb using hexagons. Help Betty Bee get to the honey pot by colouring the path of hexagons that contain numbers in order from 1-6.



Write the number sequence 1-6.

1-6

1 2 3 4 5 6

Lesson 7

7

Trace and write

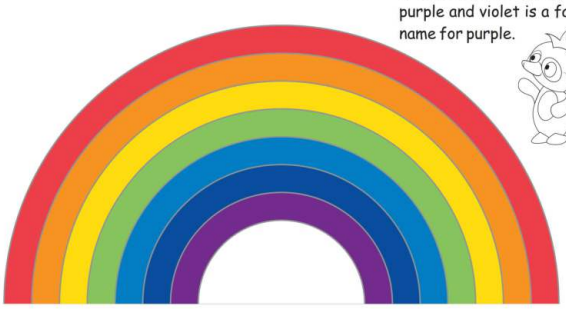
7

Find the Sumstix that is seven white Sumstix long. Colour the long Sumstix below to match. Then find the correct colours for the other two Sumstix in each group and colour the pictures to match.

Review and Practice

A rainbow has seven colours, although we don't always see them all. From the top, they are: red, orange, yellow, green, blue, indigo and violet. Colour the rainbow below using the correct colours.

Indigo is a dark blue-y purple and violet is a fancy name for purple.



Write the number sequence 1-7.

1-7

1 2 3 4 5 6 7

Write the number that each Sumstix represents.

7

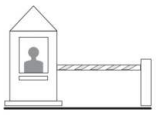
3

4

6

5

2



Lesson 8

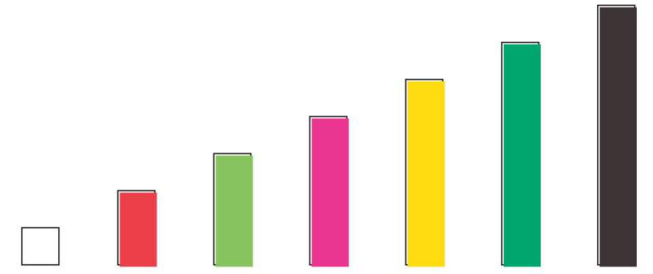
Checkpoint 1

Write the number sequence 1-7.

1-7

1 2 3 4 5 6 7

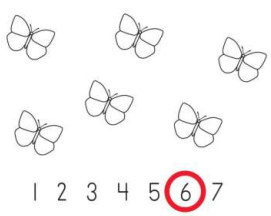
Write the numbers 1-7 under the rods. Colour the Sumstix using the correct colours.

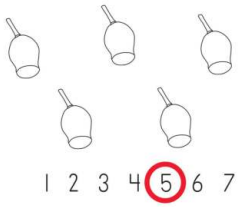


1 2 3 4 5 6 7

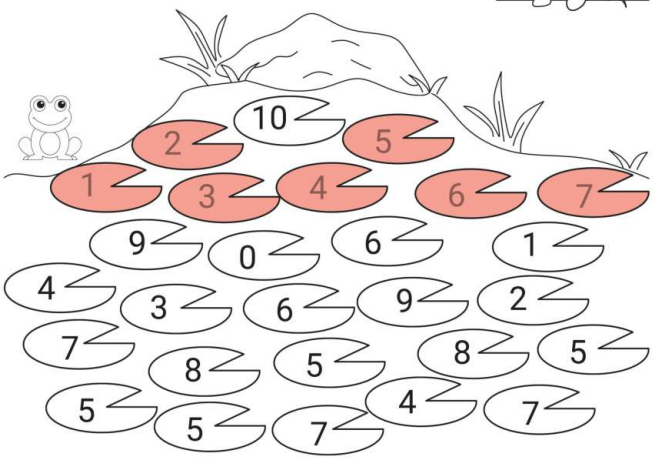
Build the following pattern with your Sumstix and colour the picture to match.

Count the pictures and circle the correct number.





Colour the lilipads in order from 1 to 7 to take Froggy from one side of the bank to the other. The lilipads are numbered so that there is an unbroken path from the frog to the opposite bank.



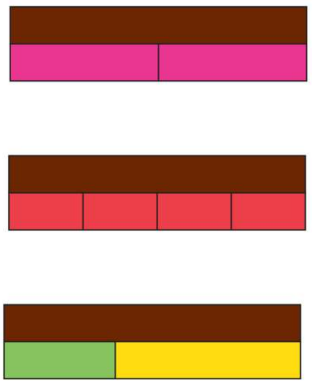
Lesson 9

Numbers 0-10 Part 2

Trace and write

8

Find the Sumstix that is eight white Sumstix long. Colour the long Sumstix below to match. Then find the correct colours for the other Sumstix in each group and colour the pictures to match.



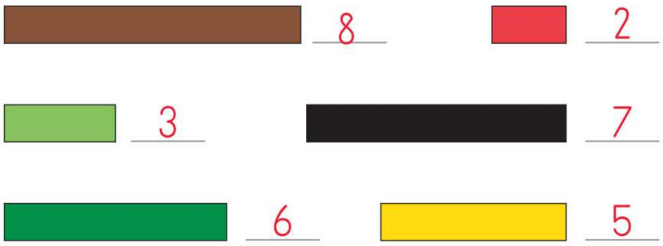
Review and Practice

Write the number sequence 1-8.

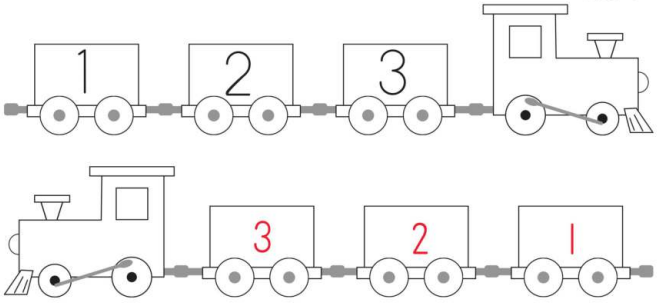
1-8

1 2 3 4 5 6 7 8

Write the number that each Sumstix represents.



The top picture shows a train on the way to town. Write the numbers on the carriages on the bottom picture to show what it will look like on the way back to the yards (assume the train travels on a loop so the engine stays in the same place compared to the carriages).

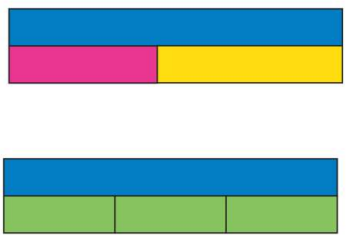


Lesson 10

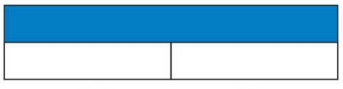
Trace and write

9

Find the rod that is nine white Sumstix long. Colour the long Sumstix below to match. Then find the correct colours for the other Sumstix in each group and colour the pictures to match.



Challenge: can you find a Sumstix that is exactly half the length of a blue (9) Sumstix?

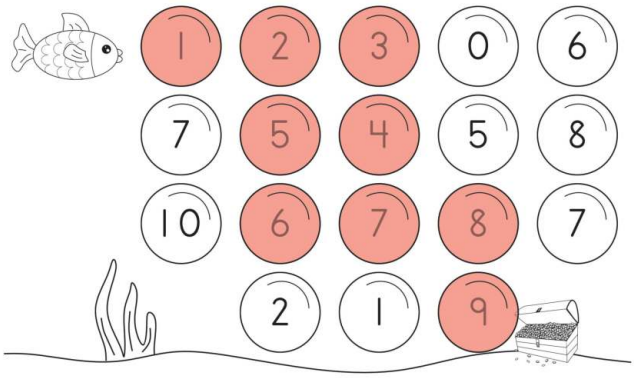


Not possible

Hint: Can you make this picture with your Sumstix?

Review and Practice

Help the fish find the treasure by colouring a path through the bubbles that passes through the numbers 1-9 in order.



Write the number sequence 1-9.

1-9

1 2 3 4 5 6 7 8 9

Write the number that each Sumstix represents.

9

2

6

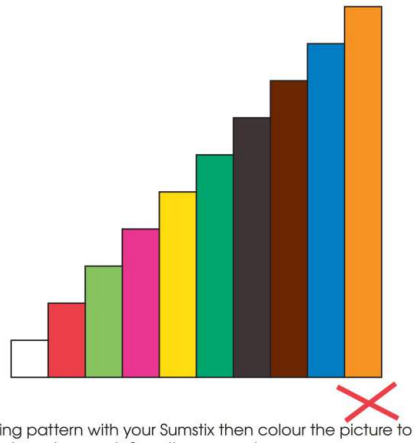
Lesson 11

10

Trace and write

10

Colour the Sumstix and place a cross under the 10 Sumstix.



Build the following pattern with your Sumstix then colour the picture to match. Tell your parent what number each Sumstix represents.

Review and Practice

Write the number sequence 1-10.

1- 10

1 2 3 4 5 6 7 8 9 10

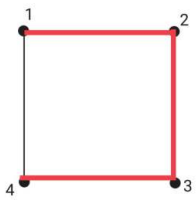
Write the number that each Sumstix represents.

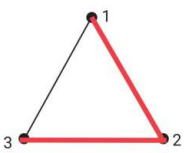
7

5

10

Use a ruler to join the dots. What shapes have you made?





Lesson 12

0

Trace and write

0

Zero means nothing or no objects. There is no Sumstix for zero. Write the number represented by each Sumstix (or space) below.

5

8

3

7

0

10

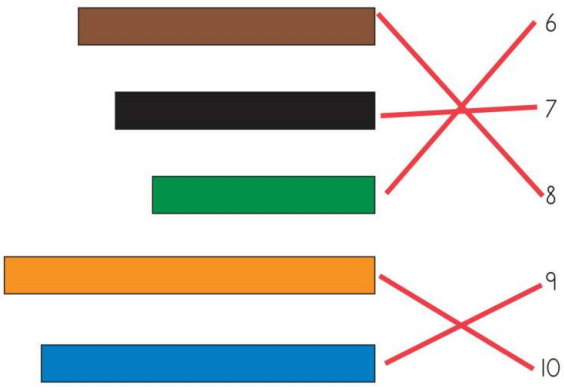
Review and Practice

Write the number sequence 0-10.

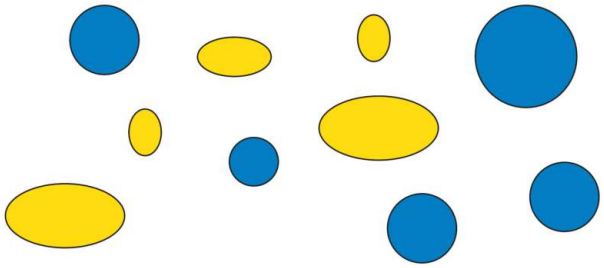
0-10

0 1 2 3 4 5 6 7 8 9 10

Match the Sumstix to the numbers.

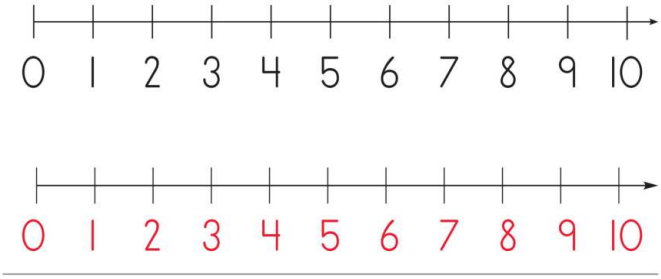


Circles and ovals have no (or zero) corners. Colour the circles blue and the ovals yellow.



Lesson 13

A number line can be used to show the order of numbers. Make the bottom number line look like the top one by writing numbers in the right places.

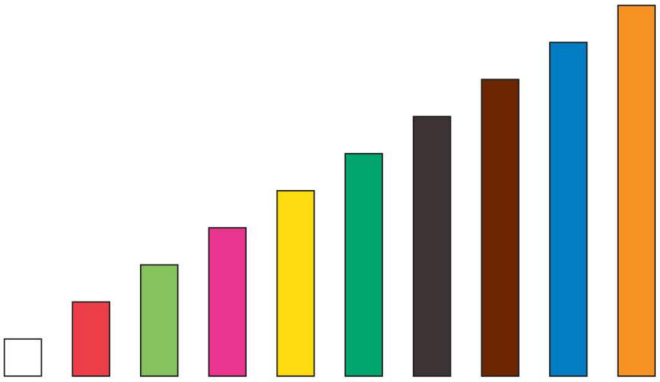


We can use a number line to help us count on from a number. Count on from each of the numbers below. The first one is done for you.

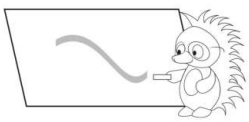
8 9 10
0 1 2
1 2 3
3 4 5
2 3 4
4 5 6
5 6 7
7 8 9
6 7 8
8 9 10

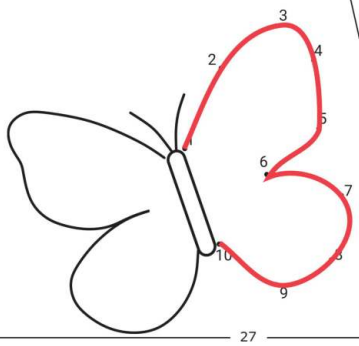
Review and Practice

Colour the Sumstix and write the number represented by each one below.



Join the dots to complete the picture.

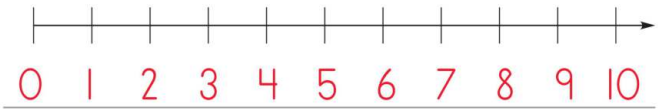




Lesson 14

Before you get started on this lesson, get out either your number cards or your Sumstix. You'll need one of each of the numbers 1-10 (or the sticks representing these). Put the cards in order on your desk or make a staircase with your Sumstix. Leave these off to the side or at the top of your desk so you can use them to help you with the activities in this lesson.

We can use a number line to help solve many different types of mathematical problems. Fill in the numbers on the number line below. Start with zero. After zero you'll be able to just copy the numbers off your cards or write the values of the Sumstix in the staircase.



The middle number is missing from the following sequences. You may use your Sumstix staircase or the number line above to help you find it. Write the missing number in the space provided.

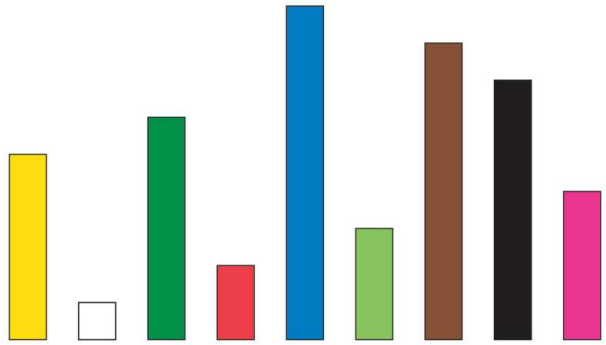
2 3 4
3 4 5
7 8 9
6 7 8
8 9 10
4 5 6

Write the numbers that come before and after the numbers given. Again, you may use the number line above or your Sumstix staircase to help you find them.

8 9 10
2 3 4
1 2 3
4 5 6
7 8 9
5 6 7

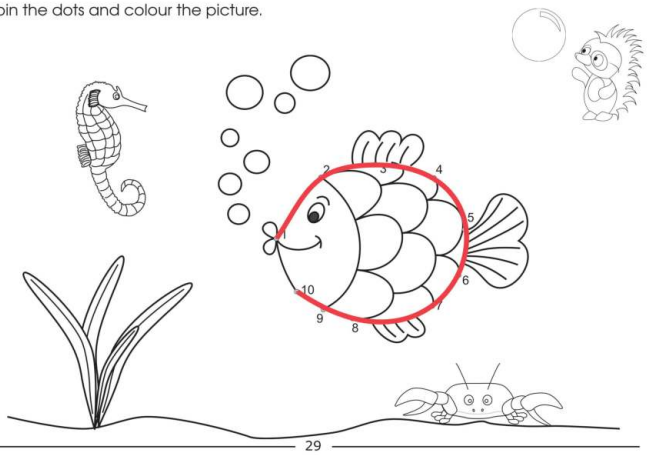
Review and Practice

Write the number that each Sumstix represents below it.



5 1 6 2 9 3 8 7 4

Join the dots and colour the picture.



Lesson 15

Let's pretend that we are counting down for a rocket launch.
Read the numbers below:

10 9 8 7 6 5 4 3 2 1 0

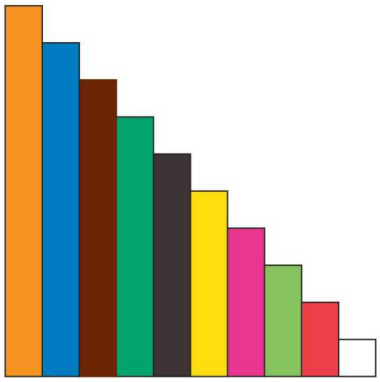
Blast OFF!

For fun why not make a rocket? You could do it as a craft activity using a toilet roll centre and coloured paper or even play dough or modelling clay. You could also use your favourite construction toy. Then you can have fun counting down and launcing your rocket into space! (And get heaps of countdown practice at the same time).

Write your own countdown on the line below.

10 9 8 7 6 5 4 3 2 1 0

Arrange your Sumstix in a staircase that goes down to represent counting backwards. Colour the picture below to match.



Review and Practice

Write the numbers 0-10 in the correct places under the number line.

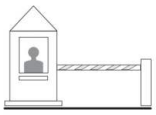
0 1 2 3 4 5 6 7 8 9 10

Write the number that comes between the numbers given.

3 4 5	5 6 7	4 5 6
0 1 2	8 9 10	7 8 9
2 3 4	6 7 8	1 2 3

Count on from each of the numbers below.

4 5 6	3 4 5
5 6 7	1 2 3
6 7 8	2 3 4



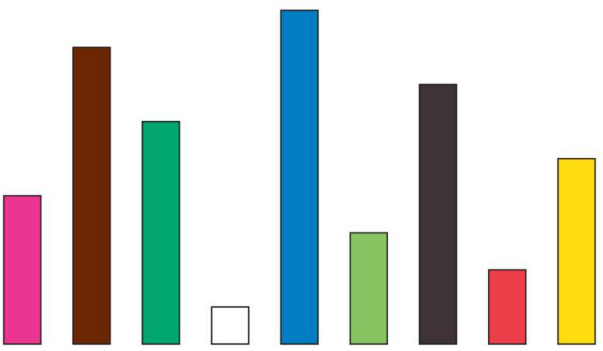
Lesson 16

Checkpoint 2

Fill in the numbers on the number line starting at 0.

0 1 2 3 4 5 6 7 8 9 10

Colour the Sumstix and write the number that each one represents below it.



4 8 6 1 9 3 7 2 5

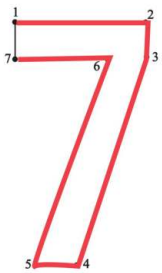
Write the number that comes between the numbers given.

4 5 6	7 8 9	8 9 10
2 3 4	0 1 2	3 4 5

Write the numbers that come before and after the number given.

3 4 5	6 7 8	8 9 10
1 2 3	7 8 9	2 3 4

Join the dots in order from 1-7. What number did you draw?



Review and Practice

Fill in the numbers on the number line starting at 0.

0 1 2 3 4 5 6 7 8 9 10

Count on from each of the numbers below.

0 1 2	6 7 8
2 3 4	3 4 5
4 5 6	5 6 7
1 2 3	8 9 10

Write a countdown from 10 to 0.

10 9 8 7 6 5 4 3 2 1 0

Lesson 17

Comparing and Sorting Numbers

Circle the biggest number in each box.

10	0	3	**8**	6	2
5	1	**9**	4	**7**	3
2	5	**6**	1	**8**	7
3	9	**10**	**4**	0	1

Circle the smallest number in each box.

3	5	7	**0**	4	1
8	9	**2**	**1**	10	6
4	**1**	8	**0**	3	5
9	7	**6**	10	**2**	6

Lesson 18

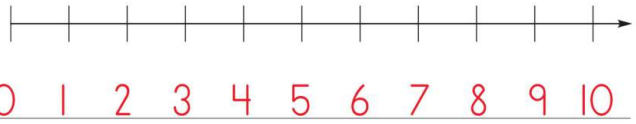
Today we're going learn how to put numbers in order. We can use number cards or Sumstix to help us. When you want to sort numbers, find the number cards or the Sumstix that match the numbers to be sorted. If you're using Sumstix, arrange them from shortest to longest (or the other way round). Then you can copy down the numbers they represent in order. If you're using number cards, sort them using a number line to help if you need it then copy the numbers down in order.

Rewrite the numbers in each box so that they are in order from smallest to biggest.

5 7 9 5 7 9	8 2 1 1 2 8
10 3 0 0 3 10	6 4 10 4 6 10
10 9 7 7 9 10	2 6 3 2 3 6
5 8 4 4 5 8	0 1 10 0 1 10

Review and Practice

Fill in the numbers on the number line starting at 0.



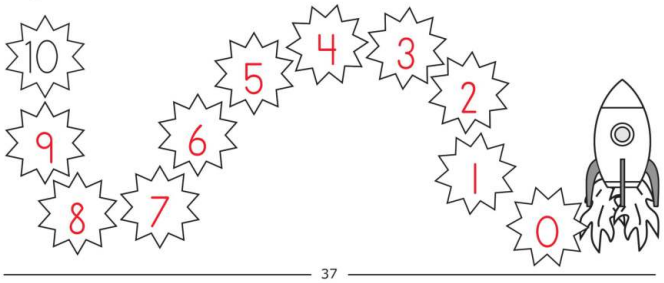
0 1 2 3 4 5 6 7 8 9 10

Count BACK from the following numbers

5 4 3
10 9 8
4 3 2
9 8 7

2 1 0
6 5 4
3 2 1
8 7 6

Fill in the countdown to send the rocket off.



Lesson 19

Rewrite the numbers in each box so that they are in order from biggest to smallest.

9 5 0 9 5 0	4 1 10 10 4 1
2 6 3 6 3 2	8 7 6 8 7 6
8 0 1 8 1 0	3 2 4 4 3 2
5 7 9 9 7 5	6 10 3 10 6 3

Review and Practice

Write a countdown from 10 to 0.

10 9 8 7 6 5 4 3 2 1 0

Write the number that comes between the numbers given.

8 9 10
0 1 2
1 2 3

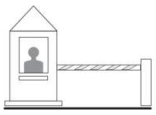
3 4 5
2 3 4
4 5 6

5 6 7
7 8 9
6 7 8

Count on from each of the numbers below.

3 4 5
5 6 7
1 2 3
4 5 6

2 3 4
0 1 2
6 7 8
8 9 10



Lesson 20

Checkpoint 3

Circle the largest number in each box.

(7)	2	0	8	(9)	1
5	(10)	3	4	6	(7)
3	5	(9)	(10)	0	4

Circle the smallest number in each box.

4	(0)	6	10	5	(3)
8	(1)	7	9	(2)	6
(2)	8	9	(3)	7	5

Rewrite the numbers in each box so that they are in order from smallest to biggest.

5 9 3	4 8 6
3 5 9	4 6 8
4 7 5	10 3 8
4 5 7	3 8 10

Rewrite the numbers in each box so that they are in order from biggest to smallest.

9 10 1	7 2 5
10 9 1	7 5 2
0 8 3	6 4 1
8 3 0	6 4 1

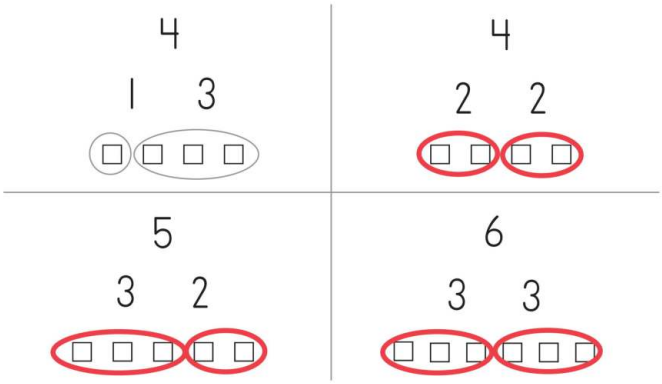
Write a countdown from 10 to 0.

10 9 8 7 6 5 4 3 2 1 0

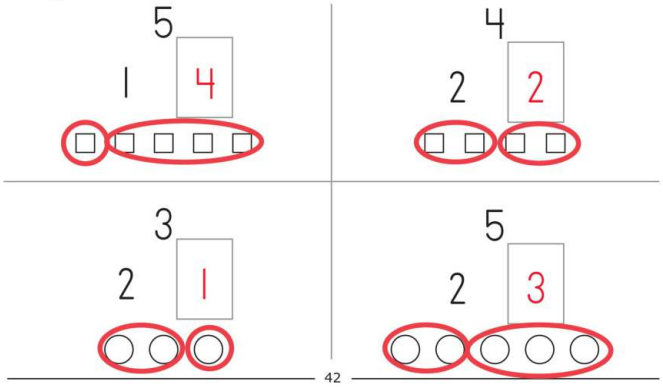
Lesson 21

The Concept of Addition

We are going to break a total into two smaller parts. The big number tells the total and the small numbers tell the parts. Draw circles to show the parts.



The total and one of the parts is given. Draw circles around the shapes to find the missing number.



Review and Practice

Fill in the numbers on the number line starting at 0.

0 1 2 3 4 5 6 7 8 9 10

Rewrite the numbers in each box so that they are in order from biggest to smallest.

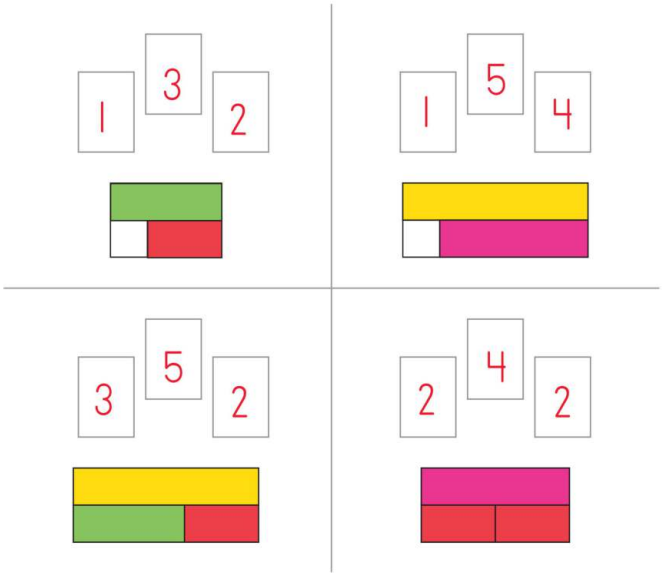
3 5 10	1 9 4
10 5 3	9 4 1
2 0 6	8 7 10
6 2 0	10 8 7

Build and colour:

Lesson 22

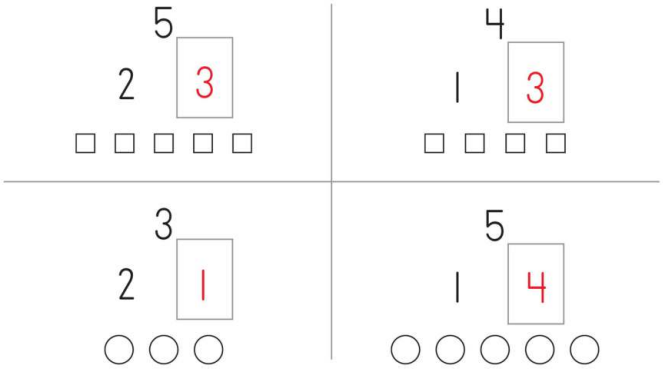
We can use Sumstix to represent breaking a total into parts. Make the patterns shown with your Sumstix and colour the picture to match.

Colour the Sumstix and fill in the numbers for the total and parts.



Review and Practice

Find the missing part.



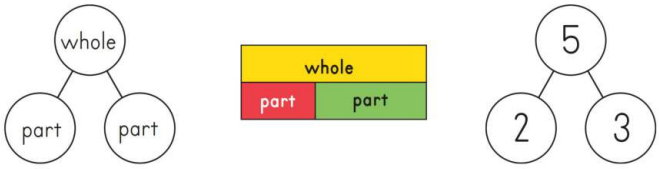
Write a countdown from 10 to 0.

10 9 8 7 6 5 4 3 2 1 0

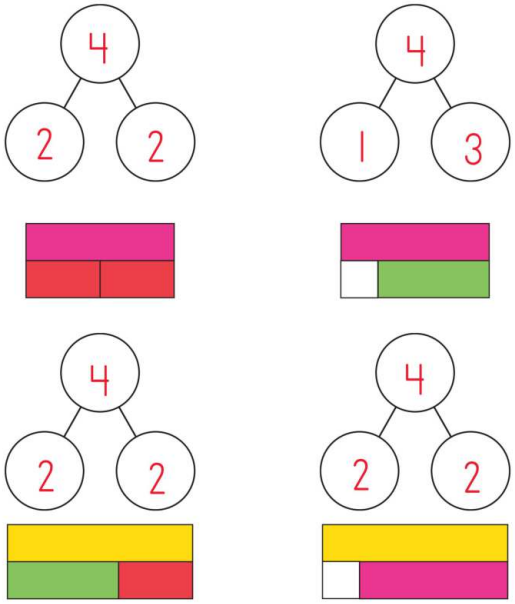
Continue the pattern.

Lesson 23

We can show the idea of breaking a number into parts with a number bond (sometimes called part-part-whole diagrams). The top number is the whole and the bottom numbers are the parts.



Fill in the total and parts on the number bonds to match the Sumstix trains.

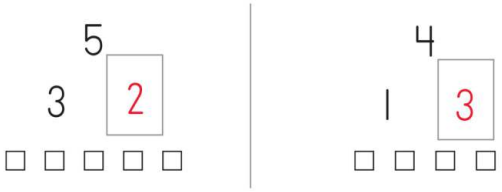


Review and Practice

Count on from each of the numbers below.

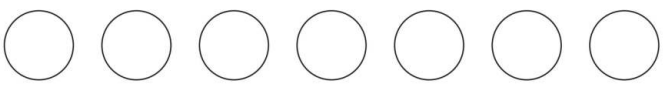
7	8	9	3	4	5
1	2	3	0	1	2
4	5	6	5	6	7
2	3	4	8	9	10

Find the missing part.



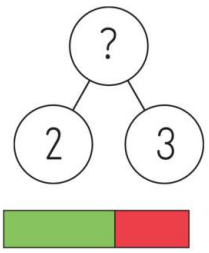
Parent to check below. Accept any repeating pattern.

Colour the circles to make a repeating pattern.



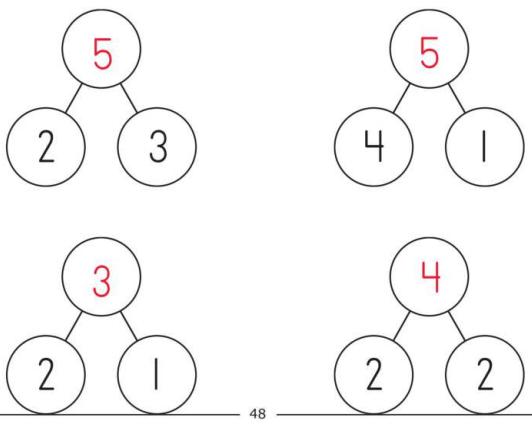
Lesson 24

We can use Sumstix to help us find a missing total in a number bond. Simply make a train to represent the parts and then find the Sumstix that is the same length as the train.



Which of the following Sumstix is the same length as the train above? Colour it.

Fill in the total in the number bonds. You may use Sumstix to help you.

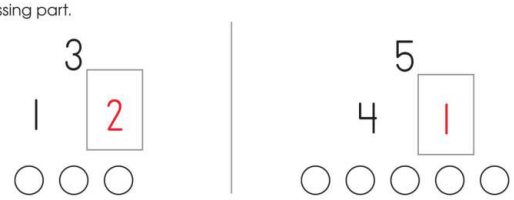


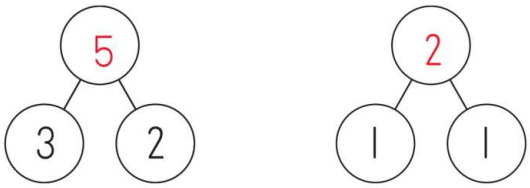
Review and Practice

Write the numbers that come before and after the number given.

6 7 8	3 4 5	4 5 6
0 1 2	1 2 3	7 8 9
8 9 10	2 3 4	5 6 7

Find the missing part.



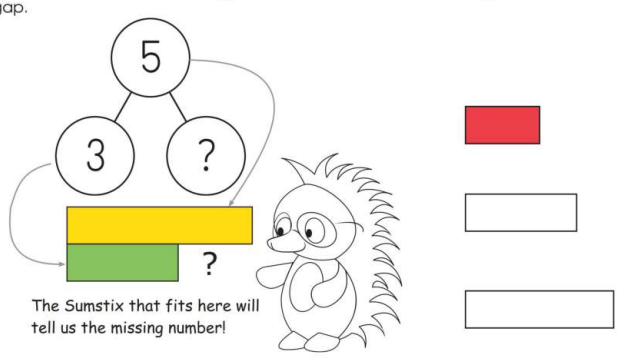


Write a countdown from 10 to 0.

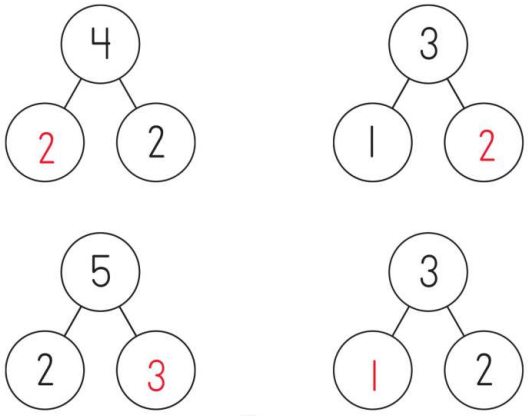
10 9 8 7 6 5 4 3 2 1 0

Lesson 25

We can use Sumstix to help us find a missing part in a number bond. Find the Sumstix representing the total and the given part. Place them together and find the Sumstix that you need to "fill in" the missing part. Colour the Sumstix on the right which fills in the gap.



Fill in the missing part in the number bonds. You may use Sumstix to help you.

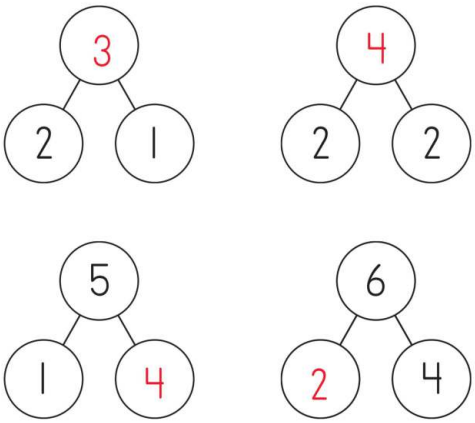


Review and Practice

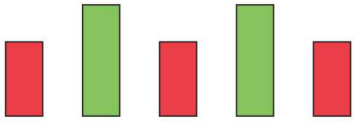
Fill in the numbers on the number line starting at 0.

0 1 2 3 4 5 6 7 8 9 10

Find the missing number.



Make this pattern with your Sumstix and then colour the picture to match.

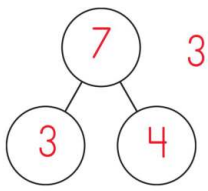


Lesson 26

Today we will see how to use number bonds and Sumstix to help us solve story problems. Your teacher will read the problems and do the example with you.

Example:

Josh was cleaning his room. He found 3 round pencils under his bed and 4 triangular pencils under his desk. How many pencils did he find all together?

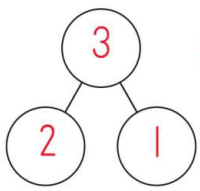


3 + 4 = 7

7 pencils

Now try these on your own. It's OK if your parent has to read them to you.

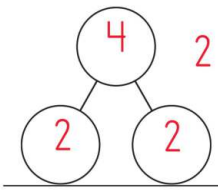
Sandy saw one butterfly on a flower and two butterflies fluttering around the flower. How many butterflies did Sandy see?



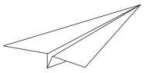
2 + 1 = 3

7 butterflies

Dan made two red paper planes and two blue paper planes. How many paper planes did Dan make?



2 + 2 = 4

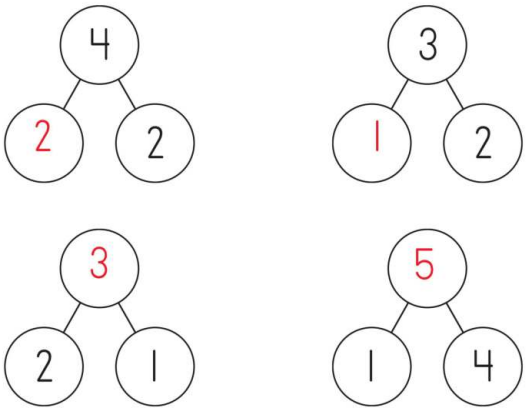


4 planes

Write a countdown from 10 to 0.

10 9 8 7 6 5 4 3 2 1 0

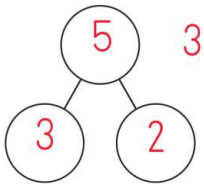
Write the missing number.



Write the number that comes between the numbers given.

8 9 6	7 8 5	2 3 0
3 4 1	6 7 4	10 11 8
4 5 2	9 10 7	5 6 3

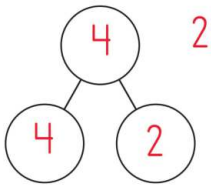
Jenny has 3 girl guinea pigs and 2 boy guinea pigs. How many guinea pigs does Jenny have all together?



3 + 2 = 5

5 pigs

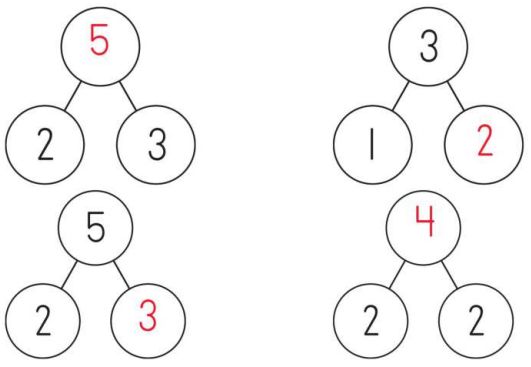
Challenge:
Mum gave Cooper four cookies. He gave two to his sister. How many cookies did he have left for himself?

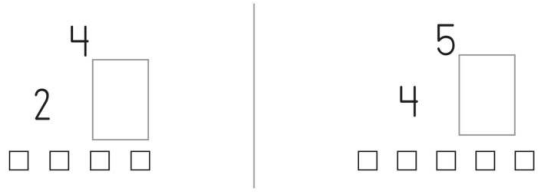


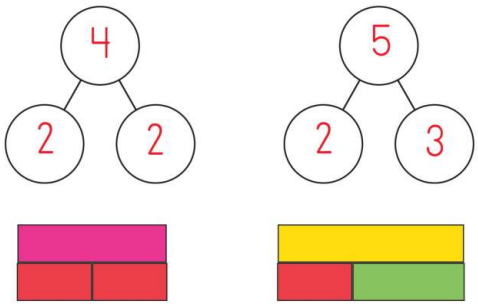
2 + 2 = 4

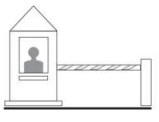
2 cookies

Write the missing number.

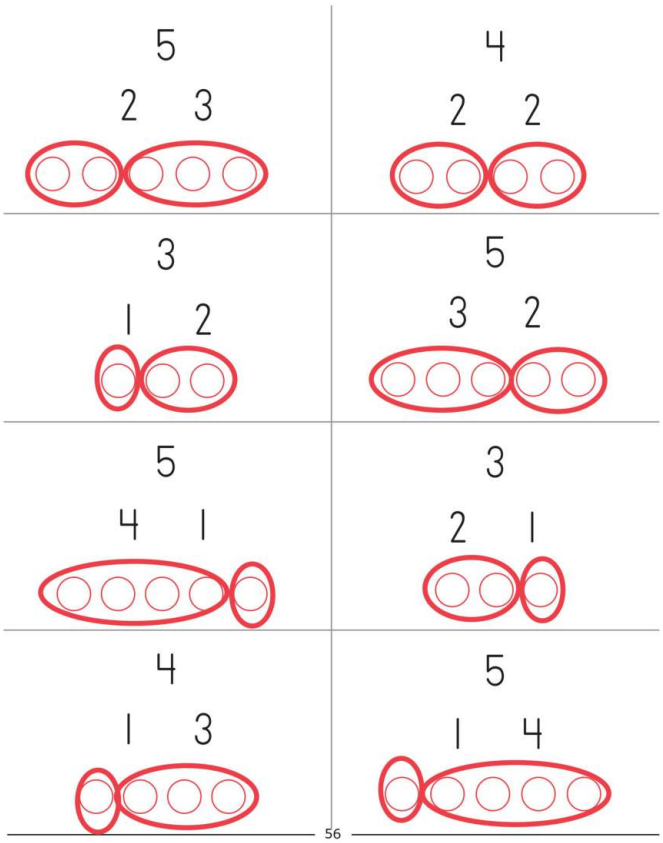




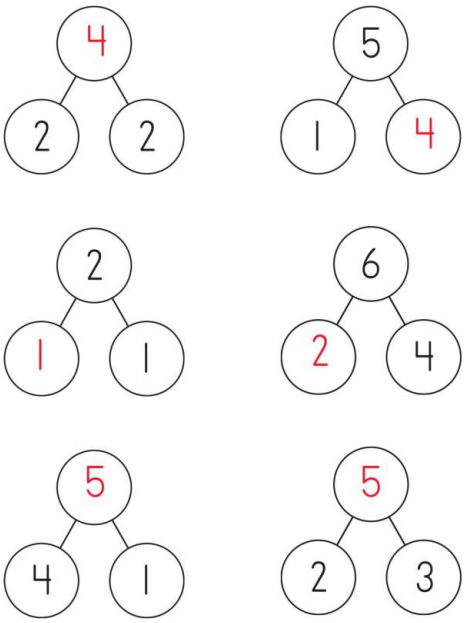




Draw shapes to match the total and then break them into the parts shown.

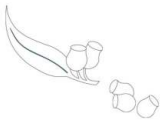


Fill in the missing number in each number bond. You may use Sumstix to help you.

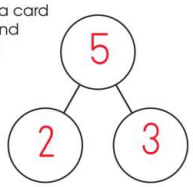


Fill in the number bond to solve the story problem.

Sarah was outside looking for things with which to make a card for her grandmother. She found two gumnuts in a tree and three on the ground. How many gumnuts were there all together.



2 + 3 = 5

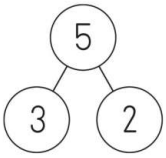


5 gumnuts

Lesson 29

Introducing Addition Within Ten

We have seen a few different ways to describe two groups and a total:

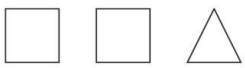


Today, we learn that we can use mathematical symbols to write an equation like this:

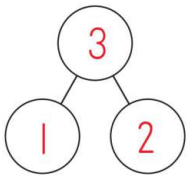
3 + 2 = 5

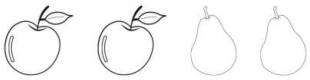
And we read the equation as "three plus two equals five" or "three and two make five".

Fill in the number bond and write equations for each of the pictures below. You may also tell a story to an adult about the pictures.

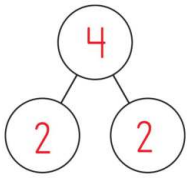


2 + 1 = 3



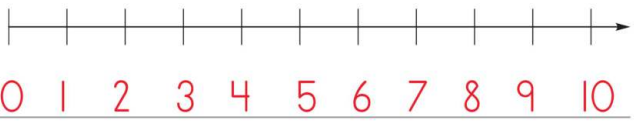


2 + 2 = 4

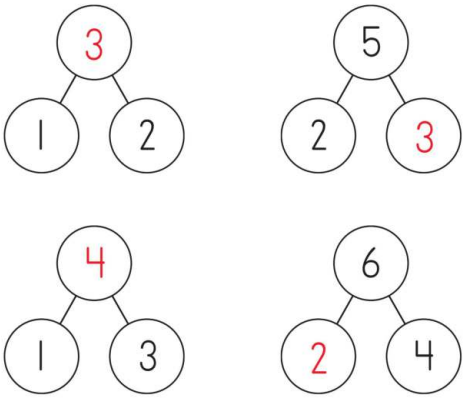


Review and Practice

Fill in the numbers on the number line starting at 0.

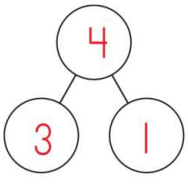


Write the missing number.



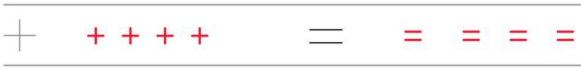
Fill in the number bond and and write equations for the picture.

3 + 1 = 4

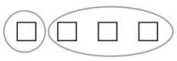


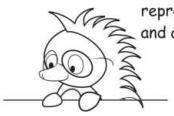
Lesson 30

Practise writing plus and equals signs:



1 + 3 = 4

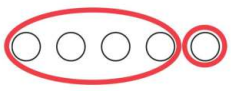




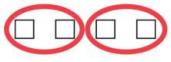
The addition equation represents two parts and a total.

Break up the group of shapes (total) into two smaller groups (parts) to match the equations.

4 + 1 = 5

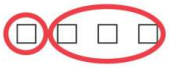


2 + 2 = 4



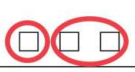
2 + 3 = 5

1 + 3 = 4



3 + 1 = 4

1 + 2 = 3



Review and Practice

Count on from each of the numbers below.

7 8 9

1 2 3

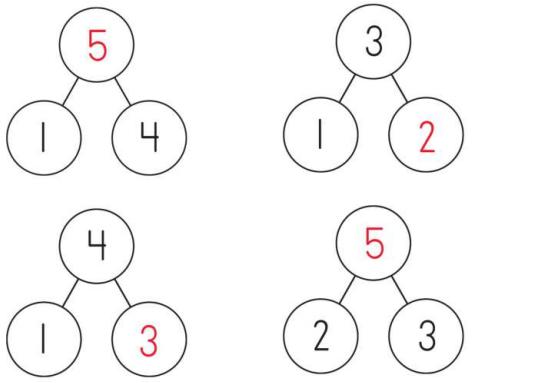
4 5 6

2 3 4

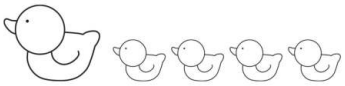
3 4 5

0 1 2

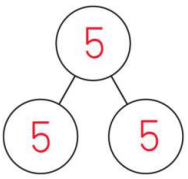
Write the missing number.



Fill in the number bond and and write equations for the picture.



1 + 4 = 5



Lesson 31

Break the group of shapes into two parts and write an addition equation. You will be able to do this in many different ways.

1 + 1 = 2

Answers will vary.
Parent to check.

Review and Practice

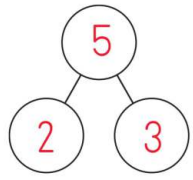
Write the numbers that come before and after the number given.

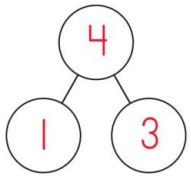
1 2 3 5 6 7 3 4 5

6 7 8 2 3 4 4 5 6

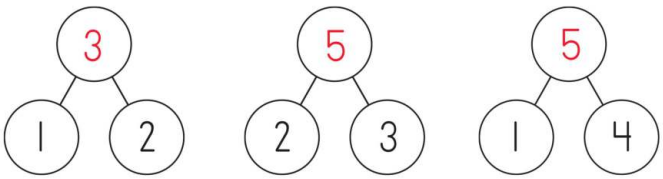
7 8 9 8 9 10 0 1 2

Fill in the number bonds to match the Sumstix patterns.





Write the missing number.

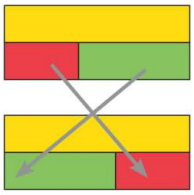


Lesson 32

Sumstix trains can be used to represent addition equations:

3 + 2 = 5

But what happens when we "flip" a Sumstix train around?



3 + 2 = 5

2 + 3 = 5

Both trains are the same length! The only thing that changes is the order of the shorter Sumstix. This means that the equations above are almost the same. We will call them "mirror sums."

Find the mirror sum to each of the following equations. You may use Sumstix to help.

1 + 2 = 3 2 + 1 = 3

3 + 1 = 4 1 + 3 = 4

4 + 2 = 6 2 + 4 = 6

2 + 5 = 7 5 + 2 = 7

Review and Practice

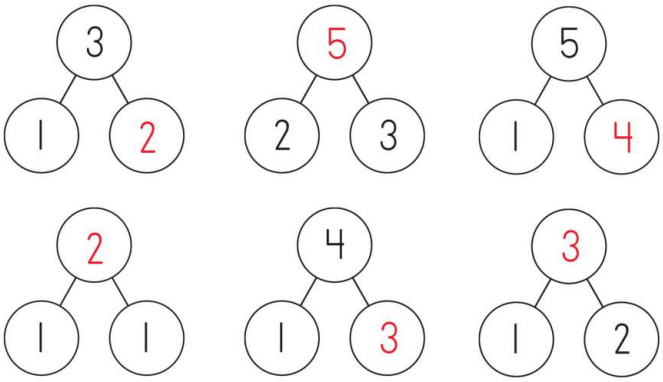
Write the number that comes between the numbers given.

2 3 4 | 6 7 8 | 4 5 6

7 8 9 | 3 4 5 | 5 6 7

8 9 10 | 0 1 2 | 1 2 3

Write the missing number.

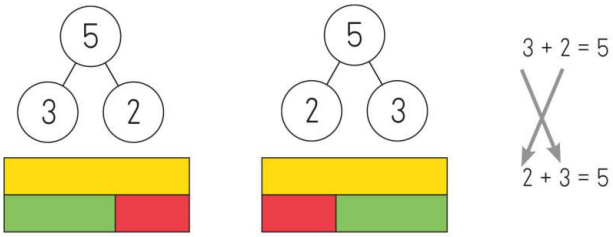


Write a countdown from 10 to 0.

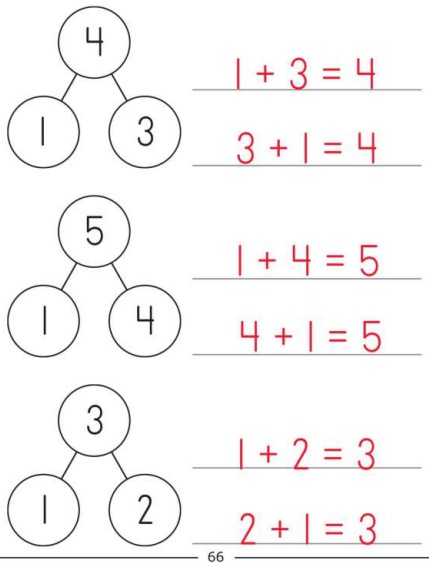
10 9 8 7 6 5 4 3 2 1 0

Lesson 33

Notice that we can flip a number bond around just like we did with the Sumstix train. So we can use one number bond to write two mirror sums.



Write two addition equations for each of the number bonds below.



Review and Practice

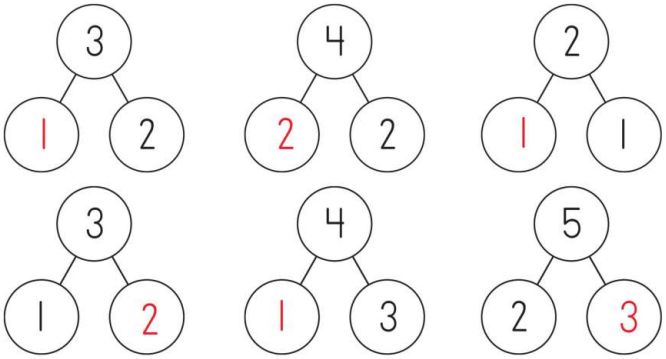
Count BACK from the following numbers

4 3 2 | 8 7 6

3 2 1 | 2 1 0

5 4 3 | 6 5 4

Write the missing number.



Write the the answer to the sums below. You may use Sumstix.

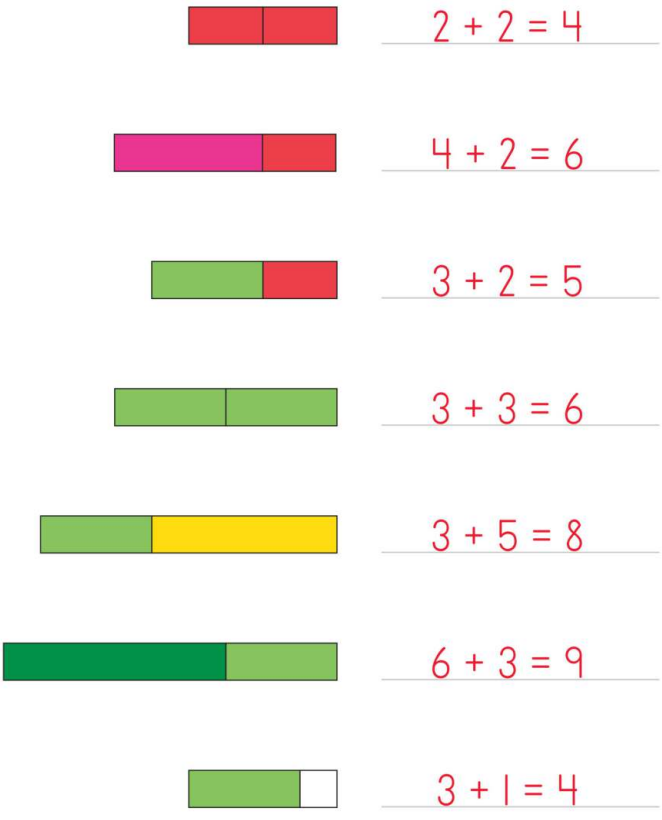
2 + 1 = 3 | 4 + 1 = 5 | 3 + 1 = 4

2 + 3 = 5 | 1 + 2 = 3 | 1 + 1 = 2

1 + 3 = 4 | 1 + 4 = 5 | 3 + 2 = 5

Lesson 34

Write the addition problem represented by each Sumstix train. Then use your Sumstix to find the answer. Finally, write the answer down.

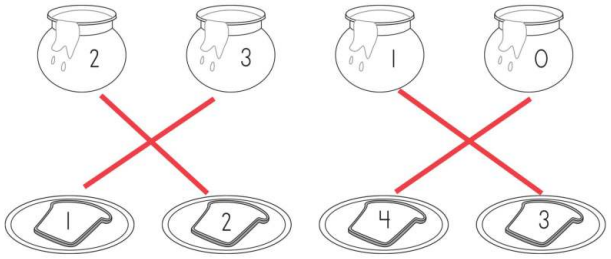


Review and Practice

Sort the numbers in each box from biggest to smallest.

2 10 8	1 9 7
10 8 2	9 7 1
6 3 5	10 4 9
6 5 3	10 9 4

Join the honey to the bread so that the numbers add to four.



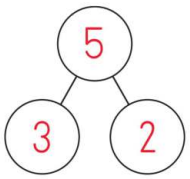
Write the the answer to the sums below. You may use Sumstix.

1 + 2 = 3	3 + 2 = 5	2 + 2 = 4
1 + 3 = 4	2 + 3 = 5	1 + 4 = 5
1 + 1 = 2	3 + 1 = 4	2 + 1 = 3

Lesson 35

Solve the story problems:

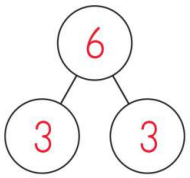
Jane was at an aquarium. She saw three starfish in one tank and two starfish in another tank. How many starfish did she see all together?



3 + 2 = 5

5 starfish

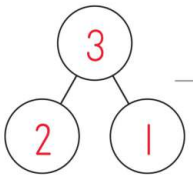
Froggy hopped over three lilipads and stopped to eat a fly. Then he hopped over three more lilipads to reach the bank of the pond. How many lilipads did Froggy jump over?



3 + 3 = 6

6 lilipads

Zach was playing at the beach. He put two scoops of dry sand and one scoop of wet sand in his bucket. How many scoops of sand did he put in his bucket?



2 + 1 = 3

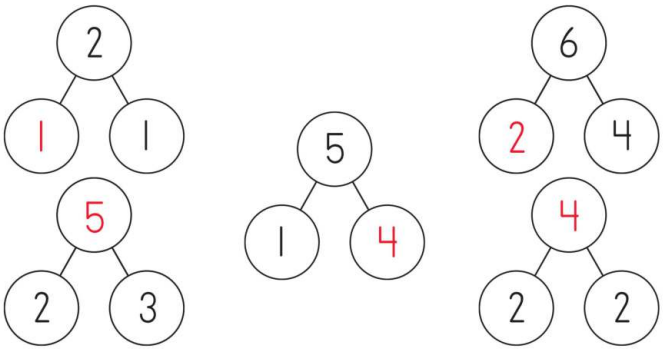
3 scoops

Review and Practice

Write the number that comes between the numbers given.

5 6 7	0 1 2	6 7 8
2 3 4	1 2 3	4 5 6
8 9 10	3 4 5	7 8 9

Write the missing number.



Write the the answer to the sums below. You may use Sumstix.

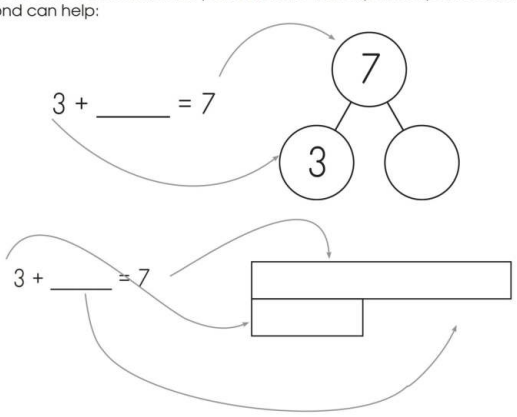
1 + 1 = 2	2 + 3 = 5	3 + 1 = 4
1 + 2 = 3	1 + 4 = 5	3 + 2 = 5
2 + 2 = 4	4 + 1 = 5	2 + 1 = 3

Lesson 36

Missing number problems are very common in mathematics.

3 + _____ = 7

To solve this we can use Sumstix, but if you're not sure which pattern you need, a number bond can help:



Fill in the missing number in each of the following addition equations. You may use Sumstix to help. If you need extra help, draw a number bond on a scrap of paper or a white board .

2 + 2 = 4	4 + 5 = 9
1 + 8 = 9	2 + 5 = 7
3 + 3 = 6	2 + 6 = 8

Review and Practice

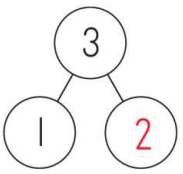
Write the the answer to the sums below. You may use Sumstix.

3 + 2 = 5 | 1 + 3 = 4 | 1 + 4 = 5

1 + 2 = 3 | 2 + 1 = 3 | 4 + 1 = 5

2 + 3 = 5 | 2 + 2 = 4 | 3 + 1 = 4

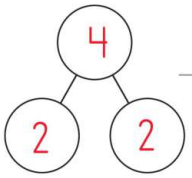
Fill in the missing number and then write the two sums represented by the number bond.



1 + 2 = 3

2 + 1 = 3

In the owl family there are two big owls and two little owls. How many owls are in the owl family?



2 + 2 = 4

4 owls

Lesson 37

In the last lesson we learned how to find the missing number in the following equation. Go ahead and fill in the blank now. Use your Sumstix if you need to.

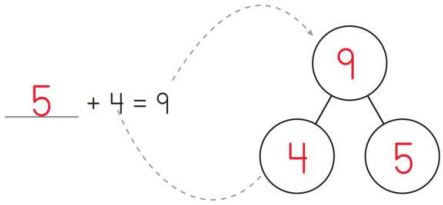
3 + 4 = 7

But what if the blank is at the start of the equation?

____ + 4 = 9

The equation may look a bit weird, but the process is the same. Fill in the number bond below to match the equation. Then use your Sumstix to find the missing number.

5 + 4 = 9



Fill in the missing number in each of the following addition equations. You may use Sumstix to help. If you need extra help, draw a number bond on a scrap of paper or a white board .

3 + 4 = 7

1 + 8 = 9

2 + 5 = 7

3 + 2 = 5

9 + 1 = 10

2 + 8 = 10

1 + 5 = 6

2 + 3 = 5

Review and Practice

Count on from each of the numbers below.

3 4 5

5 6 7

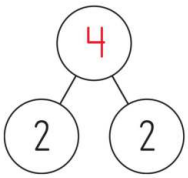
4 5 6

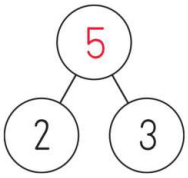
2 3 4

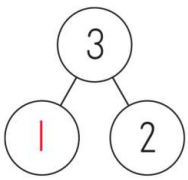
6 7 8

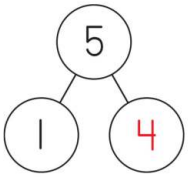
8 9 10

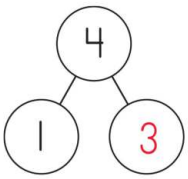
Write the missing number.











Write the the answer to the sums below. You may use Sumstix.

3 + 1 = 4 | 2 + 2 = 4 | 1 + 3 = 4

1 + 2 = 3 | 1 + 1 = 2 | 3 + 2 = 5

1 + 4 = 5 | 2 + 1 = 3 | 2 + 3 = 5

Lesson 38

Now that we know how to add numbers and solve addition equations, let's look at a very special number: 0. What do you think the following equation means? Can you work out the answer?

5 + 0 = ____

The answer is 5. If you worked this out AND know WHY the answer is 5, skip ahead to the practice activities opposite. Otherwise, let's learn about this equation now.

Remember that when we say that we have zero of something, it means we have nothing. So the above equation simply means that I start with five things and add no more. I still have only five things. Not very exciting.

Let's look at what happens if we flip the equation around.

0 + 5 = ____

This time we're saying that we start with nothing and add five so now we have five things. That's a bit more interesting because it's always nicer to end up with more than you start with (especially if we're talking about something yummy...)

The important thing to remember is that if you start with 0 and you add anything, you end up with the anything. If you start with anything and add zero, you still end up with the anything. I'm going to try and trick you below, but if you remember these two ideas, you'll win!

Solve these addition equations. Some of them contain numbers or symbols that you probably don't know. Don't worry about them. Just remember our rule: zero plus anything is the anything. Anything plus zero is the anything you started with.

Example: zero plus banana equals banana.

2 + 0 = 2

1 + 0 = 1

0 + 3 = 3

0 + 6 = 6

0 + 74 = 7

0 + 9 = 9

0 + 4 = 4

4 + 0 = 4

42 + 0 = 42

0 +  = 

Review and Practice

Find the missing numbers in the following equations.

0 + 10 = 10

4 + 0 = 4

0 + 8 = 8

0 + 3 = 3

4 + 0 = 4

0 + 6 = 6

5 + 0 = 5

8 + 0 = 8

Sort the numbers in each box from biggest to smallest.

7 2 6	4 1 8
7 6 2	8 4 1

Write the the answer to the sums below. You may use Sumstix.

2 + 2 = 4	4 + 1 = 5	1 + 3 = 4
3 + 1 = 4	2 + 1 = 3	1 + 2 = 3
3 + 2 = 5	1 + 1 = 2	2 + 3 = 5

Lesson 39

Now we will mix things up and put everything together that we have learned. Fill in the missing number in each of the following addition equations. You may use Sumstix and/or number bonds to help.

3 + 7 = 10

2 + 2 = 4

3 + 2 = 5

8 + 2 = 10

4 + 6 = 10

10 + 0 = 10

5 + 0 = 5

9 + 10 = 10

3 + 0 = 3

5 + 3 = 8

7 + 1 = 8

7 + 3 = 10

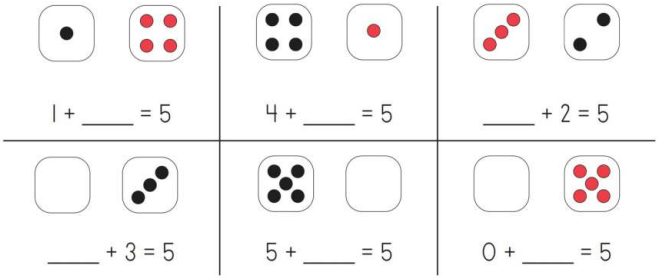
2 + 1 = 3

1 + 1 = 2

1 + 0 = 1

1 + 2 = 3

Draw dots on the second die to make five dots all together. Complete the equations.



Review and Practice

Write the the answer to the sums below. You may use Sumstix.

1 + 3 = 4	1 + 1 = 2	2 + 1 = 3
2 + 2 = 4	4 + 1 = 5	1 + 4 = 5
3 + 1 = 4	3 + 2 = 5	2 + 3 = 5

Write the mirror sums.

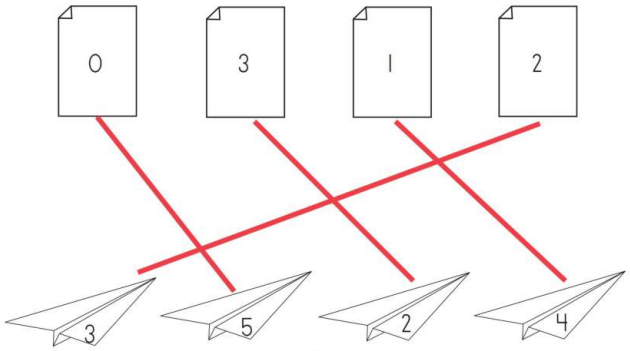
2 + 4 = 6

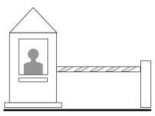
4 + 2 = 6

1 + 3 = 4

3 + 1 = 4

Join each sheet of paper with a paper plane so that the numbers on them add to 5.



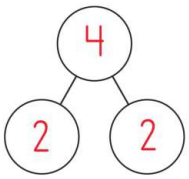


Lesson 40

Checkpoint 5

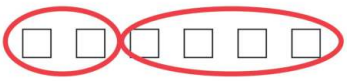
Fill in the number bond and write an addition equation to match the picture.

2 + 2 = 4



Draw circles around the squares to make two groups to match the addition equation.

2 + 4 = 6



Write the two mirror sums that are represented by the Sumstix patterns below.

2 + 3 = 5

3 + 2 = 5

3 + 4 = 7

4 + 3 = 7

Write the the answer to the sums below. You may use Sumstix.

2 + 2 = 4

4 + 5 = 9

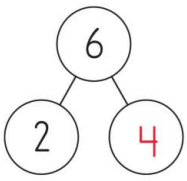
1 + 8 = 9

2 + 5 = 7

3 + 3 = 6

2 + 6 = 8

Use Sumstix to fill in the missing number in the number bond and then write the two mirror sums that can be represented by the number bond.

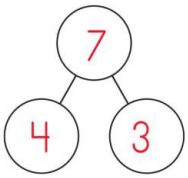


2 + 4 = 6

4 + 2 = 6

Solve the word problem.

A pod of dolphins was swimming around the Jones' boat. Kate counted four dolphins swimming around the bow and three dolphins jumping out of the water. How many dolphins did Kate count?



4 + 3 = 7

7 dolphins