

Introduction

The aim of this kit is to cover the National Curriculum for primary aged children. It is designed to be easy for any adult to facilitate, with very little preparation.

We aim to use the Three R's when learning with children: Relax, Relate, Repeat.

Relax - try to start the activity in a good mood yourself. Sit somewhere comfortable. Be encouraging and calm.

Relate - there are lots of opportunities to learn about each other's likes and dislikes. Children learn well if they are sharing their learning with an adult they trust. Bring your own relationship into the learning.

Repeat - learning takes time and repetition is incredibly helpful. All of the activities in the box are designed to be enjoyed several times.

Some of the Extension Activities require additional items not included in the box, such as pencils and paper, tin foil or a torch. These activities are all optional, not required to cover the curriculum, but would help to consolidate learning.

We have tried to include equipment in the box that will be fun and engaging as well as educational. But, the most important resource is the adult working with the child. Children learn a great deal through conversation and play with adults. Much of the National Curriculum focuses on children expressing their ideas and listening to other people's ideas. The conversations that you have whilst completing the activities are a key component of education. You can model attentive listening and insightful questioning by taking an interest in your child's ideas.

Though it can be fun to have a bit of a challenge, attempting activities that are far too hard is likely to demoralise your child and not to help them master new skills. Pay attention to non-verbal cues as well as what they're saying, so that you know when things are getting too tricky.

It is, of course, fantastic to supplement any curriculum with trips, cooking, crafts, sports, and socialising. This kit is only intended to cover the basics. Supplement it with things that interest you and your child.

How to Use the Kit

- ★ Start slow. At first, you should probably only attempt one activity a day.
- ★ Find somewhere comfortable - ideally with a flat surface to lay out all your equipment.
- ★ Read through the instructions and begin with the first one.
- ★ Try not to worry about getting everything 'right first time'. Exploring and making mistakes is a very important part of learning.
- ★ You need not complete all the steps of an activity at a sitting. Go as far as you can comfortably, then stop for the day.
- ★ You should try to repeat the activities. You might get a bit further on your second try. Or it might take four or five repeats before your child finds the games easy.
- ★ It's more important to consolidate learning than it is to finish the book, so don't rush your child through the activities. Try not to set yourselves any deadlines.
- ★ When you've done an activity, fill in the record sheet (at the back of the book) so that you know how far you got.
- ★ Success looks like children engaging enthusiastically, contributing their own ideas and questions, incorporating some of the ideas into their own play. Academic progress will follow these signs.

Literacy

L001
Letter Families

Equipment:

Box of foam letters

White board

White board pen and eraser

- 1) Get one of each letter out of the box. Lay them out in the order of the alphabet to check they're all there.
- 2) Look at the shapes of the letters and say their sounds together.
- 3) Sort the letters into groups, following the table below:

Curly Family	Tall Family	Tails Family	Sharp Family	Dots Family	Humps Family
a	b	f	v	i	m
c	h	p	w	j	n
d	k	y	x		r
e	l		z		u
g	t				
o					
q					
s					

- 4) Can you make any words using letters from only one Letter Family? For example the word 'age' only uses letters from the Curly Family.
- 5) Make your own groups of similar letters. Talk about why letters belong in a group together. What would you call your Letter Families? (NB. It doesn't matter how the children sort their letters, whether they sort them by sound, shape, or familiar words that they contain - the aim of this exercise is to look at the letters and talk about them together.)
- 6) Use the white board to write your letters in their family groups.
- 7) Can you make any words using letters from only one of your Letter Families?
- 8) Try sorting capital letters into Letter Families. Do you put the same groups of letters together?

Extension:

Using a ruler, you could make a table like the one above, to show the Letter Families that you have chosen, with their names.

If you have some colouring pencils, or crayons, you could try to make a picture using letters. Can you make one picture using each letter family?

Spot the Picture, Spot the Letter

Equipment:

Time snail

Anatomy and alphabet sheet

Foam letters

- 1) Lay out the Time Snail sheet.
- 2) Can you find a boat?
- 3) Can you see a queen?
- 4) Can you spot a rocket?
- 5) Take it in turns to name things for your partner to find.
- 6) When your child is ready, move on to spotting letters on the alphabet sheet. Show them an 'a' from the foam letters. Can they find the 'a' on the alphabet sheet?
- 7) Ask your child to point to a letter on the alphabet sheet and find it in the foam letters for them.
- 8) Take it in turns to choose letters for your partner to find.
- 9) When your child is ready, swap roles so that you point to a letter on the sheet and they find the foam letter. Then they find a foam letter and you point it out on the alphabet sheet.

Extension

Play this game with other books you own. Take it in turns to name things to spot in the illustrations. Then take it in turns to name letters for one another to spot. You don't always need to use the foam letters, try pointing at one 's' on the page and ask your child if they can find another 's'.

Make your own spotting picture. If you can, make a photo collage and spot family members and pets.

L003
Talk Like a Tortoise

Equipment:
Foam letters

- 1) Can you talk like a cat? Try saying 'I like fish' in a cat voice.
- 2) Can you talk like a dog? Try saying 'I wag my tail' in a dog voice.
- 3) Can you talk like a robot? Try saying 'I have a switch' in a robot voice.
- 4) Can you say 'sloooooow' like a tortoise?
- 5) Can you say 'quick-quick-quick' as fast as a cheater?
- 6) Lay out the word: butterfly, and split it into pieces. Can you say the word in pieces, like a woodpecker, 'but-ter-fly'?
- 7) Can you break up this one: 'sn-ai-l'?
- 8) Can you break up your name and say it in pieces?

Extension

Try splitting up a word and drawing a picture for each of the pieces. For example, for the word 'homophone', you could draw a home, a surprised face, then a telephone.

9)

Which Word Rhymes

Equipment:
Counters

- 1) Read the nursery rhymes below to your child, when you get to a choice of words, put a yellow counter on the one that fits.
- 2) See if you can think of another rhyming word that would fit in the rhyme. Re-tell the rhymes with your substituted words.

Hickory, dickory dock,
The mouse ran up the clock / wall,
The clock struck one, the mouse ran down.
Hickory, dickory dock.

Twinkle, twinkle little star,
How I wonder what you are / eat,
Up above the world so high,
Like a diamond in the cloud / sky.

Baa, baa black sheep, have you any wool?
Yes sir, yes sir, three bags full / gone.

Extension

Have a look through a book of poetry and see if you can spot the words that rhyme. Can you think of any other rhyming words that would fit there instead? Try reading the poems with your own substitutions instead of the proper words.

L004
Beginning to Read

Equipment:

This book

Foam letters

White board

White board pen and eraser

- 1) Get all the lower case 's', 'a', 't' and 'i' foam letters and put them in a pile, mix them up, then sort them into a line of each letter. Talk about the letters and the sounds that they make whilst you are doing this.
- 2) Copy out the three letters onto the white board.
- 3) Take foam letters and lay them out, with spaces between the letters, to spell 'sat'. Carefully sound out the word together, 's-a-t'. Then try to 'blend' it. Push the letters together so they're touching. Can the child hear how the letters pushed together make the word 'sat'?
- 4) Swap the 'a' for an 'i', let the child try to sound out the word first. If they struggle, demonstrate 's-i-t', then push the letters together and say 'sit'.
- 5) Try playing the other way around as well. Put the letters 'sat' together and say 'sat', then separate them out and say 's-a-t'.
- 6) The next time you play this game, add one more letter 'p'. You can use 'pit', 'pat', 'tap' and 'tip' in this round.
- 7) Here is a suggested order for introducing the letters: s, a, t, i, p, n, c, k, e, h, r, m, d, g, o, u, l, f, b.

Extension

There are lots of resources online for playing with sounds. Most of them will introduce the sounds in the same order as above. I particularly like Jolly Phonics, which has songs to introduce each letter.

Once you are familiar with the first set of letters, you can find phonics reading books online, or in the library, which have stories made using only those letters.

L005
Sound Effects

Equipment:

This book

Mini xylophone

Two of the large geometric shapes - for banging together

- 1) Read the story below together.
- 2) Read it again, but this time, every time you get to a word in **bold**, stop and make a noise, using some of the equipment above, instead of saying the word. Which noises suit which words?
- 3) Can you think of any other words that sound like the noises you can make with the xylophone?
- 4) Can you make up your own sound effect story?

I was sitting at home with my Dad and the doorbell **dinged**. Dad ran to open the door, but he tripped over his feet and landed with a **thud** on his bottom. Whoever was at the door got impatient and **knocked** hard. Dad got up and **plodded** over to the door. He opened it and saw the postman with a heavy parcel.

Dad thanked the postman and took the parcel. Something inside the parcel **tinkled**. Dad opened it up; it was full of plates; they were all broken!

Extension

Gather objects from around the house to make sound effects for your own sound effect story.

L006
Prepositions

Equipment:

Geometric shapes

Wooden animals

- 1) Find the smallest animal.
- 2) Can you put the animal **on** the big cube?
- 3) Can you put it **under** the small cone?
- 4) Can you put it **next to** another animal?
- 5) Can you put it **behind** the biggest animal?
- 6) Can you put it **in front of** the biggest animal?
- 7) Take it in turns to make up sentences with prepositions in for your partner to act out.

Extension

Take the game outside and try putting yourself on a chair, under a blanket, in front of a tree, etc.

L007
Letter Picture

Equipment:

Foam letters

White board

White board pen and eraser

- 1) Get out one of each of the foam letters and look at them.
- 2) Do any of them look like something else? Maybe you think 'z' looks like a flash of lightning or 'n' looks like the mouth of a cave.
- 3) Copy the letters that look like something else onto the white board to make a picture (I would make a cave in a lightning storm, with one big 'n' at the bottom and lots of 'z's and 'Z's in the sky, and a line of 'c's at the front to look like waves in the sea).

Extension

Take a photo of your work of art. Or make one on paper so that you can keep it.

If you have a big enough piece of paper, you could decorate it with a pattern of letters to make wrapping paper.

L008
Emphasis

Equipment:
This book
Counters

- 1) Read the sentence below to your child in a normal voice.

This is your pet.

- 2) Put a counter on the first word of the sentence. Now read it again, placing emphasis on the first word.
- 3) Ask your child if they can repeat the sentence, placing emphasis on the first word too.
- 4) Move the counter to the second word. Now read it, placing emphasis on the second word.
- 5) Ask your child if they think the sentence implies something different when you change the emphasis. When we emphasise 'this' it implies that there's some surprise that the object we're discussing is a pet. When we emphasise 'is' it implies that we're insisting the object is a pet.
- 6) Move the counter to the third word. Both try and read the sentence emphasising the third word.
- 7) What meaning is implied when the 'your' is emphasised?
- 8) Move the counter to the fourth word. Both try and read the sentence emphasising the fourth word.
- 9) What meaning is implied when the 'pet' is emphasised?
- 10) Can you make the statement below into a question, just using your voice:

Reading is fun?

Extension

Next time you read a story together, pause and try reading a sentence with varied emphasis. How does it change the meaning of the story?

L009
Beginning to Read 2

Equipment:

This book

Foam letters

White board

White board pen and eraser

- 1) Find the lowercase letters: 's', 'a', 't', 'i', and 'p'. Ask your child if they can make a word using some of the letters.
- 2) When they've made a word, sound it out (e.g. p-a-t) then read the word (e.g. pat). Ask them if they can make any other words using the available letters. Keep going until your child has shown you all the words that they can make using these letters. Then put the letters to one side.
- 3) Now find all the 'n', 'c', 'k' and 'e' foam letters and put them in a pile. Ask your child to sort the letters into piles of the same type, so that all the 'n's are together, all the 'c's are together, etc. Pay special attention to the 'c's and the 'e's - they are quite similar!
- 4) Look at each pile and tell your child the sound they make.
- 5) Ask your child to try and copy these four letters onto the board. Write the letters yourself underneath your child's writing.
- 6) Now take the foam letters and lay them out to spell 'neck'. Sound out 'n-e-ck', then read 'neck'.
- 7) Swap the 'n' for a 'p' and ask the child to try and read the new word. If they have trouble, sound out 'p-e-ck', then read 'peck' for them.
- 8) Swap the 'e' for an 'a' and ask the child to try and read the new word. If they have trouble, sound out 'p-a-ck', then read 'pack'.
- 9) Look at all the letters available (s, a, t, i, p, n, e, c, k), ask your child if they can form any more words. If they form any words, read them, then write them onto the white board.
- 10) Next time you play this game, you can add the letters: 'h', 'r' and 'm'.

Extension

Write down a list of words that your child can spell and read. Write a story together, including as many of these words as you can. Read the story back to your child, pausing each time you reach a word that they can read and giving them a chance to supply it.

If you read through your story a few times, your child may be able to read the whole thing!

Can You Read This?

Equipment:

Foam letters

- 1) Lay out the foam letters to spell 'bed' and read it to your child.
- 2) Then rearrange the letters to make 'deb' and read it to your child.
- 3) Now rearrange the letters to make 'ebd' - sound it out 'e-b-d' and explain that it isn't a word. Some arrangements of letters are words and others aren't.
- 4) Use the foam letters to spell 'cat', read it, then ask your child to rearrange the letters, try to read the result. (Tac is a word, Act is a word Tca isn't!)
- 5) Use the foam letters to spell 'tap', read it, then ask your child to rearrange the letters. Ask them if they think they have made a word or not. Then try to read it.
- 6) Arrange the letters to spell cat again. Read it to your child. Then muddle the letters up and ask your child to try and rearrange them to spell cat again.
- 7) Show your child 'bed', read it to them. Then muddle up the letters and ask your child to try and make them say 'bed' again.

Extension

Hide some letters around a room or garden. Ask your child to run around, find the letters, and then try to arrange them to spell a word. Sound out whatever word they've made, is it a real word?

Fact Files

Equipment:

White board

White board pen and eraser

- 1) Read the fact files below to your child:

Chicken	Oak Tree	Frog	Fir Tree
Family: Bird	Family: Tree	Family: Amphibian	Family: Tree
Offspring: Egg	Offspring: Acorn	Offspring: Frogspawn	Offspring: Pine Cone

- 2) What do all the fact files have in common? The format is the same in each one. It makes it easy to compare the different living things.
- 3) What would you put in a fact file for humans? Let your child dictate a fact file for you to write on the white board.
- 4) Can you think of another living thing that you could make a fact file for? Encourage your child to dictate their choice of fact file for you to write on the white board (it doesn't matter if they choose a real or imaginary living thing) - try to get the format the same.

Extension

Get some non-fiction books out of the library and look at how they are written. Can you find any with parts that aren't written in full sentences, like the fact files above?

- 5)

Letter Bingo

Equipment:

White board

White board pen and eraser

Foam letters

- 1) Each write three letters on the whiteboard.
- 2) Take it in turns to close your eyes and pull a letter out of the box.
- 3) If it's one of the letters written on the board, put a tick next to the letter.
- 4) Keep going until one of you has ticked all three of your letters.
- 5) When you have ticked all three of your letters, you can shout, 'bingo!'
- 6) Play more rounds. When you're ready, try writing a word on the board instead of just three letters.

Extension

If you have a big cardboard box and some ripped up newspaper, you can make your bingo a bit more exciting by putting the letters in the box to pull out. You could put some small toys or sweets in the box as well as added surprises, so that sometimes players will pull out a treat instead of a letter!

Describe the Animal

Equipment:

Wooden animals

- 1) Pick an animal and say, 'This is a ____.'
- 2) Take it in turns to add an adjective (e.g. small, red, funny, friendly, wooden etc.). How many adjectives can you come up with to describe one animal?
- 3) Ask your child to pick another animal and have another go. Can you think of some different adjectives to describe this one?
- 4) Can you play with yourselves (e.g. I am a short, friendly, tired mummy)?

Extension

This is a good game to play at a meal or snack time. How many adjectives can you think of to describe what you're eating and drinking?

Capital Letters and lower case letters

Equipment:

Foam letters

Anatomy and alphabet sheet

Globe

- 1) Get a pile of lower case letters and a single capital letter and mix them up.
- 2) How quickly can your child find the capital letter?
- 3) Ask your child to take a turn at hiding the capital letter in a pile of lower case letters, and see how quickly you can find it.
- 4) Now play the other way around: hide a single lower case letter in a pile of capital letters and see how quickly you can each find it.
- 5) Have a look at the two alphabets on the anatomy sheet. Which one is capital letters and which one is lower case letters?
- 6) Can you make the alphabet in foam letters? Can you make an alphabet with one capital and one lower case for each letter?
- 7) Blow up the globe and have a look at how the words are written. All the words on the globe are proper names. Most are written with a capital letter at the beginning. But, some of the words are written in BLOCK CAPITALS. Can you find a word written in capital letters? Why do you think this word is written in capitals?
- 8) Sometimes people use block capitals for emphasis. To show that words are very important. Other times people use block capitals to make their writing easier to read - like in forms. Forms often ask you to write your name in capital letters. Can you use the foam letters to make your name in capitals?

Extension

Postcodes are always in block capitals. Write someone a letter - don't forget to include your own address somewhere, so that they can reply. Maybe you could write to me:

Frogotter,
4 Neeps Terrace,
Middle Drove,
Marshland St James,
Norfolk
PE14 8JT

9)

Beginning to Read 3

Equipment:

This book

Foam letters

White board

White board pen and eraser

- 1) Find the lowercase letters: 's', 'a', 't', 'i', 'p', 'n', 'e', 'c', 'k', 'h', 'r' and 'm'. Ask your child if they can make a word using some of the letters.
- 2) When they've made a word, sound it out (e.g. h-a-t) then read the word (e.g. hat). Ask them if they can make any other words using the available letters. When your child has spelt a few words, put the letters to one side.
- 3) Now find all of the 'd', 'g', 'o', 'u', 'l', 'f', and 'b' foam letters and put them in a pile. Ask your child to sort the letters into piles of the same type.
- 4) Look at each pile and tell your child the sound they make.
- 5) Use some of these letters to spell out 'dog' and ask your child if they can read it. If they have trouble, sound it out yourself 'd-o-g', then read it 'dog'.
- 6) Swap the 'd' for an 'l', and ask your child to try and read the new word. If they have trouble, sound it out yourself 'l-o-g', then read it 'log'.
- 7) Swap the 'l' for an 'f', and ask your child to try and read the new word. If they have trouble, sound it out yourself 'f-o-g', then read it 'fog'.
- 8) Swap the 'f' for a 'b' and read 'bog'; then swap the 'o' for a 'u' and read 'bug'.
- 9) Retrieve the letters from the first game ('s', 'a', 't', 'i', 'p', 'n', 'e', 'c', 'k', 'h', 'r' and 'm') and ask your child if they can make any words.
- 10) If your child spells out a word using the foam letters, copy it onto the board.
- 11) Then make another word yourself using the foam letters and ask your child to copy it onto the board.
- 12) Keep going until you run out of words!
- 13) Next time you play, introduce the sounds 'j', 'z', 'v', 'w', 'y', and 'x'.

Extension

When you're reading a story to your child during the day (unless your child asks to do it, avoid reading practise with bedtime stories - they're meant to be relaxing), pause when you get to a word that you think they can read and encourage them to have a go. If they make a mistake, just read the word yourself and carry on with the story, don't encourage multiple attempts that might be upsetting and ruin the flow of the story.

What Kind of Book?

Equipment:

This book

- 1) Read the opening lines below and talk about what kind of book they might come from?

Molly was a little girl, but she had huge powers.

Aardvark: noun. A mammal with a long snout.

There were ghosts in the old factory.

Daisies are a kind of flower, their scientific name is *Bellis perennis*.

- 2) Can you think of any other types of book? Can you think about how they might start?

Extension

How many different types of book can you find in your home or local library?

Build a Sentence.

Equipment:

This book

- 1) We're going to make sentences together, each saying one word at a time, until you have a whole sentence (e.g. One player might say 'today', the other could say, 'I', the first 'ate', the second 'some', the first 'chocolate' - the sentence: today I ate some chocolate).
- 2) When you've played a couple of times, try taking it in turns to say a sentence, and tell a story together.
- 3) When you've played a couple of times, try taking it in turns to say a single word and see if you can build a whole story together.

Extension

If you can, record yourselves playing this game, then you can play it back and listen to yourselves telling the whole story.

Vowels

Equipment:
Foam letters

- 1) Collect together all the vowel letters:

a, e, i, o, u

- 2) Tell your child the sounds that the vowel letters make (ah, eh, i, o, uh). How long can you make the sounds for? These are the short vowel sounds.
- 3) The vowels can also make long vowel sounds (when followed by an e, for example). Get the capital vowels out:

A, E, I, O, U

- 4) Tell your child the names of the letters (ay, ee, aye, oh, you). How long can you make the sounds for? Can you tell why these are called the long vowel sounds?

Extension

Read a poem together. Have a look at the words at the ends of the lines, do they have long vowels or short vowels in them?

Can You Write This?

Equipment:

White board

White board pen and eraser

- 1) Write these sounds on the white board and read them to your child:

urgle

bleeko

flurb

wobboloo

- 2) Ask your child to make up some more fun noises, and write the noises they suggest on the white board, and read them back to your child.
- 3) If they're ready, encourage your child to have a go at reading the funny sounds.
- 4) If they're ready, make up some sounds of your own and ask your child to have a go at writing them.
- 5) If all your funny noises were words in an alien language, what do you think they would mean?

Extension

Watch a cartoon together. Every time there's a sound effect, pause the cartoon and try to spell the sound effects.

Beginning to Read 4

Equipment:

This book

Foam letters

White board

White board pen and eraser

- 1) When two letters are together they sometimes make a different sound. Take 'a' and 'i' out of the box and ask your child if they can remember the sound these letters make. Help, if they're stuck.
- 2) Push the letters together and tell your child that when these letters are together they make the sound 'A', like in 'paint' and 'snail'.
- 3) Ask your child to try and select foam letters and arrange them to spell 'paint'. If they make a mistake, show them how to spell it correctly. Once you have the word in foam letters, both try and write it on the white board.
- 4) Ask your child to try and select foam letters and arrange them to spell 'snail'. If they make a mistake, show them how to spell it correctly (don't worry if they suggest a word like 'day', just explain that the sound 'A' can be spelt in several different ways). Once you have the word in foam letters, both try and write it on the white board.
- 5) Ask your child to try and come up with a sentence with both words in. If they get stuck, you could use: 'My pet snail likes to paint.' Write your sentence on the board and read it back, pause at the words 'snail' and 'paint' and give your child a chance to read them.
- 6) Ask your child if they can think of any other words with the 'A' sound in. If they think of any, use the foam letters to show them how to spell these words. Otherwise, you could suggest some words and use the foam letters to spell them together (e.g. 'nail', 'sail', 'rain').
- 7) Next time you play this game, use the letters 'o' and 'a' to introduce the sound 'Oh' as in the words 'soap' and 'toad'. (Your child may name some words with the 'oh' sound in that are spelt with 'oh' or 'o_e' - if that happens, just show how the word is spelt and explain that a lot of sounds have more than one way of being written.)

Once you have mastered all those letters, introduce the concept of sounds made from two letters together with the sound 'ai', like in 'paint' and 'snail'. You can play exactly the same game, though! The second round of sounds, could be introduced in this order: ie, ee, or, ng, oo, ch, sh, th, qu, ou, oi, ue, er, ar

Equipment

This Book

- 1) Choose two letters.
- 2) Read the poem below and count the number of times each letter occurs. The one that appears most frequently wins.

From a Railway Carriage

Faster than fairies, faster than witches,
Bridges and houses, hedges and ditches;
And charging along like troops in a battle,
All through the meadows the horses and cattle:
All of the sights of the hill and the plain
Fly as thick as driving rain;
And ever again, in the wink of an eye,
Painted stations whistle by.

Here is a child who clambers and scrambles,
All by himself and gathering brambles;
Here is a tramp who stands and gazes;
And there is the green for stringing the daisies!
Here is a cart run away in the road
Lumping along with man and load;
And here is a mill and there is a river:
Each a glimpse and gone for ever!

By Robert Louis Stevenson

Extension

You can use any story or poem you have to have a sound race.

Identifying Letters

Equipment:

Foam Letters,

World map

- 1) Take it in turns to hide four different letters under the map. Your partner should put their hand under the map and try to guess the letters by feel.
- 2) Pull the letters out as you guess them and see if you were right.
- 3) Now take it in turns to hide four lower-case letters and their matching upper-case letters under the map.
- 4) Can your partner find, identify and match a lower-case and upper-case version of the same letter and bring both out?

Extension

Try making letters out of playdough, biscuit dough, or lego and see if your partner can identify these letters by feel.

Pictionary

Equipment:

White board,

White board pen and eraser,

Foam letters

- 1) Take it in turns to draw a picture, while the other person guesses what it is.
- 2) When you have guessed correctly, the adult should write the name of the picture clearly next to it.
- 3) The child should use the foam letters to copy the word that the adult has written.
- 4) If the child is ready, they could try to write the word themselves.

Extension

This is a fun game to take out and about. Try pictionary outside, using leaves and flowers to make a picture for your partner to guess.

Spot the Feeling

Equipment:

This book

- 1) Read the story below. If your child can, they should read it aloud. If they can't manage that, encourage them to read all the words they can, and read the others yourself.

When I was very little, I got lost in a supermarket. I was shopping with my parents and my big sister. We were in the same supermarket we went to every week, buying the same foods that we always bought.

None of the exciting cereals were going into our trolley. I wandered away from my family, looking for something more interesting to see. *

I saw lots of brightly coloured boxes and bottles. I saw other families shopping together. I saw the pet food aisle, with a display of cheerful toys for cats and dogs. *

When I looked around to return to my family, I couldn't find them. I looked up and down the aisle, but they were nowhere to be seen. I was alone. *

I remembered what my parents had told me and I walked straight to the front of the shop. I found a shop assistant and, exactly as I'd been told, I explained that I was lost and told them my name.*

Moments later my parents heard an announcement over the tannoy system, a child had been found, they announced my name, and said that I had been shopping with my older sister, would she please come and collect me. So, my older sister did - all of five years old herself - she marched down the aisle to the desk to collect me, our parents trailing behind her.*

- 2) Read the story again and stop at every star to talk about how the characters might be feeling. The story doesn't contain any description of the characters' emotions at all. Can you guess from what's happening? Think about the narrator, the parents, the shop assistant and the sister. How might they be feeling? Do you both agree on how the characters feel?

Extension

Read a fiction book together. Stop a few times during the story and talk about how you think the characters might be feeling. Sometimes the author will include descriptions of characters' emotions, but sometimes you will have to work it out from the circumstances or from how the characters are behaving.

Learning to Spell

Equipment:

White board

White board pen and eraser

- 1) What are the most important words for you to be able to spell? There's one list below, but what do you think? Names, foods, instructions?
- 2) What kinds of things do you want to be able to write: cards, shopping lists, stories, treasure hunt clues?
- 3) Choose five words that you want to learn to spell and play this game: ask your adult to write out your five words, each with one letter missing, see if you can fill in the missing letters. Then rub it all out and ask your adult to write the words out with a different letter missing.
- 4) If you're feeling bold, try missing out two letters, then three, and so on, until the student is able to write out the whole word.

A List of Words

off, well, miss, buzz, back, bank, think, honk, sunk, pocket, rabbit, carrot, thunder, sunset, catch, fetch, kitchen, notch, hutch, have, live, give, cats, dogs, spends, rocks, thanks, catches, hunting, hunted, hunter, buzzing, buzzed, buzzer, jumping, jumped, jumper, grander, grandest, fresher, freshest, quicker, quickest, rain, wait, train, paid, afraid oil, join, coin, point, soil, day, play, say, way, stay boy, toy, enjoy, annoy, made, came, same, take, safe, these, theme, complete, five, ride, like, time, side, home, those, woke, hope, hole, June, rule, rude, use, tube, tune, car, start, park, arm, garden, see, tree, green, meet, week, sea, dream, meat, each, read (present tense), head, bread, meant, instead, read (past tense), her, term, verb, person, better, under, summer, winter, sister, girl, bird, shirt, first, third, turn, hurt, church, burst, Thursday, food, pool, moon, zoo, soon, book, took, foot, wood, good, boat, coat, road, coach, goal, toe, goes, out, about, mouth, around, sound, now, how, brown, down, town own, blow, snow, grow, show blue, clue, true, rescue, Tuesday new, few, grew, flew, drew, threw, lie, tie, pie, cried, tried, dried, chief, field, thief, high, night, light, bright, right, for, short, born, horse, morning, more, score, before, wore, shore, saw, draw, yawn, crawl, author, August, dinosaur, astronaut, air, fair, pair, hair, chair, dear, hear, beard, near, year, bear, pear, wear, bare, dare, care, share, scared, very, happy, funny, party, family, dolphin, alphabet, phonics, elephant when, where, which, wheel, while, Kent, sketch, kit, skin, frisky, unhappy, undo, unload, unfair, unlock, football, playground, farmyard, bedroom, blackberry, the, a, do, to, today, of, said, says, are, were, was, is, his, has, I, you, your, they, be, he, me, she, we, no, go, so, by, my, here, there, where, love, come, some, one, once, ask, friend, school, put, push, pull, full, house, our

Extension:

Put a piece of paper somewhere you won't lose it, on the fridge maybe. Everytime you think of a word that you would like to learn to spell, add it to the list (with the help of an adult who can already spell it!). As soon as your list has five words on it, play the game again with your new words!

When you've practised spelling at least fifteen words, play hang man using your list of words. (Take it in turns to pick a word, but don't tell your partner what it is, just draw one line for each of the letters it has.

Then your partner guesses a letter that might be in your word. If they're right, write the letter in the correct place on top of your lines. If they're wrong, draw one line of a picture. Then they guess another letter. They keep going until either the word or the picture is complete.)

Beginning to Read 5

Equipment:

This book

Foam letters

White board

White board pen and eraser

- 1) Get the letters: 'i', 'e', 's' and 'p' out and ask your child if they can remember the sound each letter makes.
- 2) Now push together the letters 'i' and 'e' and explain that, together these letters make the sound 'eye'.
- 3) Put 'p' in front to make the word 'pie', and ask the child to try and read it. If they have trouble, sound out 'p-ie', then read 'pie'.
- 4) Put an 's' at the end and ask your child to try and read it. If they have trouble, sound out 'p-ie-s', 'pies'.
- 5) Put another 's' at the beginning and ask your child to try and read it. If they have trouble, sound out 's-p-i-e-s', 'spies'.
- 6) Swap the 'p' for a 'k' and ask the child to try and read 'skies'.
- 7) When your child is ready, introduce 'ee' with the words 'see', 'bee', 'eel', and 'heel'.
- 8) When your child is ready, introduce 'or' with the words 'born', 'torn', 'fort'. ng, oo, ch, sh, th, qu, ou, oi, ue, er, ar

Extension

Have a 'Sound Race', using two letters. You could look through a book (or even the poem 'From a Railway Carriage' in this book) and see if there are more 'ee's or 'or's, for example.

9)

Parts of Speech

Equipment:
Foam Letters
Counters
This Book

- 1) Nouns are the names of things or ideas, like 'table' or 'anger'. Can you think of any more nouns? Try to spell some nouns out with foam letters. (If a noun is a name of a person or place, it gets a capital letter and is called a Proper Noun.)
- 2) Read through the passage below and put a red counter on top of each noun.
- 3) Verbs are the words for actions, like 'sit' or 'run'. Try to think of some more verbs and spell them out with foam letters.
- 4) Read through the passage below and put a blue counter on top of each verb.
- 5) Adjectives are words that we use to describe nouns, like 'green' or 'big'. Use a green counter to identify each of the adjectives below.
- 6) Adverbs are words that describe verbs. Use a yellow counter to identify each of the adverbs below.

Queen Victoria

Queen Victoria was born in 1819. When she was a little girl she lived quietly in Kensington Palace. Victoria didn't go to school. Several tutors regularly taught her in her house. She played with dolls and with her little dog, Dash. Victoria was eighteen when she suddenly became Queen of England. She immediately moved to London and lived in Buckingham Palace. She married Prince Albert and they lived together happily. Together, Albert and Victoria had nine children. Most people in England really liked Queen Victoria and truly believed that she was a good queen. A young man called Edward Oxford shot at Queen Victoria, fortunately, he failed to hurt her. He was quickly arrested. Sadly, Albert died. Victoria constantly mourned his death. She wore black clothes. After Queen Victoria died, her son, Edward VII became King of England.

Extension

You can use any piece of writing to identify nouns, adjectives, verbs and adverbs. Maybe you could write your own piece of writing and your adult could identify parts of speech in it.

Draw What You Read.

Equipment:

White board,

White board pen and eraser.

- 1) The adult writes a simple sentence including a noun, an adjective and a verb, for example: 'The girl bounces a big ball', and reads it aloud.
- 2) Your child has to draw the sentence.
- 3) Play another version of the game, acting out the sentences that you read, rather than drawing them.
- 4) When your child is a confident enough reader, they should try to draw, or act a sentence without hearing it read aloud.
- 5) When your child is a confident enough writer, they should take turns writing sentences for you to draw or act out.
- 6) If you're feeling really artistic, try adding an adverb, for example: 'The tall boy swims slowly'.

Extension

If you're learning another language, try playing the game in that language too.

Comparative Adjectives and Superlative Adjectives

Equipment:

Geometric shapes

Wooden animals

- 1) Get out all the cubes and line them up. Which is the smallest? Line the cubes up in size order.
- 2) Point at the cubes and say: big, small, smaller, smallest.
- 3) If you were an ant, the cubes wouldn't look small at all, they would look huge. Point at the cubes, as if you were an ant and say: big, huge, huger, hugest (don't forget to go the other way around).
- 4) Get out the wooden animals and choose your three favourites. Line them up in order of preference. Then point at them and say: good, better, best.
- 5) Find the three most dangerous looking animals and line them up and name them: fierce, fiercer, fiercest.
- 6) Can you line up animals in any more comparative orders (e.g. red, redder, reddest; funny, funnier, funniest)?
- 7) Can you think of one superlative adjective for each of the animals (superlative adjectives are the most something, e.g. cutest, strangest).

Extension

Get a line of cups and fill them with water at various temperatures (don't use boiling water, though!). Ask your child to arrange them in order from coldest to hottest.

Opposites and Synonyms

Equipment:

Geometric shapes

- 1) Get out the shapes. Line up the cubes, which is big? What's the opposite of big? Small. Which cube is small?
- 2) Which shape is sharp? What's the opposite of sharp? Rounded? Blunt?
- 3) Some words have easy opposites: hot / cold; fast / slow; good / bad. Can you think of any more?
- 4) Some words are trickier to find opposites for. Is there an opposite of green? What about tired?
- 5) The opposite of opposite is synonym - those are words which mean almost the same as one another like big and huge; quick and fast; happy and cheerful. Can you think of any synonyms for hot? Can you think of any synonyms for small?

Extension

Read a poem together and underline all the adjectives. Then make a list of synonyms for all of the words and read the poem with your synonyms instead. Do you think any of the lines sound better?

Now try replacing the adjectives with opposites. Does it change the meaning of the poem completely?

6)

Beginning to Read 6

Equipment:

This book

Foam letters

White board

White board pen and eraser

- 1) Get the letters: 'h', 'c', 's' and 't' out and ask your child if they can remember the sound each letter makes.
- 2) Now push together the letters 'c' and 'h' and explain that, together these letters make the sound 'ch'.
- 3) Now push together the letters 's' and 'h' and explain that, together these letters make the sound 'sh'.
- 4) Now push together the letters 't' and 'h' and explain that, together these letters make the sound 'th'.
- 5) Lay out the letters to spell 'that' and ask your child if they can read it. If they have trouble, read 'that' for them. Then ask your child to copy the word on to the board.
- 6) Swap the 't' for a 'c' and ask your child to try and read it. If they have trouble, read 'chat' for them and ask them to try copying it onto the board.
- 7) Lay out the letters to spell 'chip' and ask your child to try and read it. Then swap the 'c' for an 's' and ask them to try and read 'ship'. Then swap the 'i' for an 'o' and try to read 'shop'.
- 8) Lay out the letters to spell 'dish' and ask your child to try and read it, then swap the 'i' for an 'a' and see if they can read 'dash'.
- 9) When your child is ready, introduce 'qu' with the words 'queen', 'quit', and 'squash'.
- 10) When your child is ready, introduce 'oo' with the words 'boo', 'zoo', 'boot'. ou, oi, ue, er, ar
- 11) When your child is ready introduce the alternative spelling 'ue', with the words 'glue' and 'cue'.

Extension

You can help your child practise their reading by making a wordsearch for them containing some of the words they're learning.

10)

Question Time One

Equipment

White board

White board pen and eraser

Foam letters

- 1) First, the adult should lay out some foam letters to spell 'yes' and 'no'; and read them to the child.
- 2) The adult writes a question with a yes or no answer on the board, e.g. Do you like chocolate?; the child then writes their answer using the foam letters.
- 3) See if your child can read the questions for themselves.
- 4) Next, try questions with a variety of single word answers, e.g. Which is your favorite toy? What colour are your eyes?

Extension

Use this game when you're offering choices during the day, for example, if there is a choice of breakfast cereal, you could write down 'Which cereal do you want this morning? Cornflakes ____ Rice Crispies ____' and your child can tick to show their preference.

Choose when to use this game, carefully. Using writing to offer exciting choices can make reading and writing more appealing. It's more enticing to read a note offering a chance to watch a film on television than one offering a chance to tidy your bedroom!

Beginning to Read 7

Equipment:

This book

Foam letters

White board

White board pen and eraser

- 1) Get the letters: 'o', 'u', 'i', 'e', 'a' and 'r' out and ask your child if they can remember the sound each letter makes.
- 2) Now push together the letters 'o' and 'u' and explain that, together these letters make the sound 'ow', as in 'out'.
- 3) Now push together the letters 'o' and 'i' and explain that, together these letters make the sound 'oi', as in 'oil'.
- 4) Lay out the letters 'b', and 'l' with a gap between them and ask your child which sound fits best: 'ou' or 'oi'. If they find this hard, try both, hopefully, they'll agree that 'boil' sounds best.
- 5) Lay out the letters 'sh' and 't' with a gap between them and ask your child which sound fits best: 'ou' or 'oi'. If they find this hard, try both, to work out 'shout'.
- 6) Try again, laying out the letters: 'p__t' (pout), 's__l' (soil), 'c__n' (coin), and 's__nd' (sound).
- 7) When you've worked out the words, ask your child to copy the words onto the board.
- 8) Challenge yourselves to tell a story containing all these words.
- 9) When your child is ready, introduce the sounds 'er', and 'ar'. Use the words 'c__'(car); 'ott__' (otter); 'h__d' (hard); 'giv__' (giver).

Extension

Try writing your story out and ask your child to illustrate it.

If I Were a Giant . . .

Equipment:

White board,

White board pen and eraser

- 1) Write 'If I were a giant, I'd squash:' at the top of the whiteboard.
- 2) Take it in turns to add items to the list, e.g. If I were a giant, I'd squash: pencils and chairs and cherry tomatoes.
- 3) When you've run out of ideas, or space, put a full stop after the final item in the list.
- 4) Go back through the list rubbing out all but the final 'and', and put commas after all the items in the list except for the last one; e.g. If I were a giant, I'd squash: pencils, chairs, and cherry tomatoes.
- 5) Play another round and ask your child to write the start, remember to use a colon to begin your list.

Extension

You can play this game, without writing it down, as a memory game. We play it in the car sometimes. When it's your turn, you have to remember the entire list and recite it before you can add a new item.

Consonants

Equipment:

Anatomy and alphabet sheet

Foam letters

Dictionary

- 1) Lay out the lowercase letters to make the alphabet - you can copy the alphabet on the sheet to help you remember the order.
- 2) Take out all the vowels (a, e, i, o and u).
- 3) All the letters that are left are consonants. Can you think of a word starting with each of the consonants? (If this is really easy - you could try to think of a food starting with each of the consonants, or an animal.) If you get stuck - you could look in the dictionary.
- 4) Can you make a word using only consonants? Hint - the letter 'y' can make an 'eye' sound in some words. 'Y' can be a consonant or a vowel.
- 5) Some words have two consonants next to each other to make one sound, like 'bl' at the beginning of 'black' or 'bleep'. Try some different combinations of consonants, can you find some that make a sound? Can you think of any words that start with that sound?
- 6) Can you find two consonants that make an unpronounceable sound together - like 'ht'?

Extension

On a sheet of paper, write your name vertically down the side, then write a word starting with each of the letters of your name - you've made an acrostic! This is mine:

Fun
Reading
Or
Going
Out
To
Trek
Everywhere
Researching

You could try to make an acrostic with words that are all associated with you.

Sometimes people use mnemonics made like this to help them spell tricky words - like Big Elephants Can Always Upset Small Elephants to help remember how to spell because. Can you make your own mnemonic for the points on a compass: NESW.

Word Machine

Equipment:

Foam letters

White board

White board pens and eraser

Dictionary

- 1) We can change some nouns into verbs by adding a suffix to the end of them. '-ify' '-ise', '-ate'. For example, if we add '-ify' to 'drama', we get 'dramify'. Can you change these nouns into verbs by matching them with the right suffixes? Be careful, sometimes you have to change the root word a bit!

Root Words	Suffixes
Beauty	-ate
Glory	-ify
Pollen	-ise
Terror	

- 2) We can change some verbs into nouns by adding the suffix '-tion' or 'er' to them. For example, if we add '-er' to 'play', we get 'player'. Can you change these verbs into nouns by matching them with the right suffixes? Be careful, sometimes you have to change the root word a bit!

Root Words	Suffixes
Bat	-er
Dilute	-tion
Compete	
Run	

- 3) We can change some nouns into adjectives by adding the suffix '-ish' or '-ful' to them. For example if we add '-ish' to 'child', we get 'childish'. Can you change these nouns into adjectives by matching them with the right suffixes? Be careful, sometimes you have to change the root word a bit!

Root Words	Suffixes
Beauty	-ful
Bull	-ish
Dread	
Fool	

- 4) Check whether your new words are right by looking them up in the dictionary.
5) Can you find any more words that can be changed like this? You might find your dictionary helpful.

Extension

Find your own words and make a table like the ones above for your adult to try and solve.

Complete the Poem

Equipment

This book,

White board,

White board pen and eraser.

- 1) Read the poem below.
- 2) Think of your own words to finish the poem and make it rhyme. Write them down on the white board, so you don't forget them.
- 3) Read the poem again with your additions.
- 4) Can you think of any other words that you could try? Write your alternate words on the board as well.
- 5) Read the poem both ways and decide which ones you like best.

A Walk

I went for a walk the other day,
On my front step I saw _____
At the end of my drive I _____
I was quite surprised to see a brown hare.
Even more surprising, the hare said, 'Hey,
I was hoping to _____.'
So the hare and I went on a walk hand in hand,
We went past the park and then past _____.
Then I felt tired, so I ran back to my house,
To end my strange day, there stood a _____.

Extension

Have a go at writing your own poem from scratch.

You could try leaving gaps in your poem for your partner to complete.

Finish the Story

Equipment:

This book

- 1) Read the story below. If your child can, they should read it aloud. If they can't manage that, encourage them to read all the words they can, and read the others yourself.

My dad and I sometimes sail in his boat together. We sail in races, as fast as we can around the buoy and back to the start. Other days, we sail out to fish for mackerel, stopping at a sandy beach to drop anchor and eat our picnic lunch. Once we sailed all the way to France. We sailed for a day and a night. During the night we took it turns to be on watch, sitting in the boat, surrounded by the dark sea, watching for ferries or tankers so that we could steer our boat out the way. About halfway across, a line broke on our main sail. It was flapping in the wind. It needed to be fixed. "You're the smallest," my dad said, "you'll have to climb up the mast and fix it." I looked up at the mast, stretching into the sky above me, as the boat rocked side to side on the waves.

- 2) Talk about how the story should end. Each come up with your own ending and tell your partner what it would be.
- 3) Can you combine your endings to make a different ending together?

Extension

Find a picture book that you haven't read before - perhaps in the library - read the first few pages, then close the book. Talk about what might happen next. Come up with your own ending for the story. The adult could write it down. Now open the book back up and read how the original author ended the story. Was it similar to your ending? Which one did you prefer? Why?

Question Time Two

Equipment

White board

White board pen and eraser

Foam Letters

- 1) Write a question on the board and ask the child to answer either by arranging the foam letters, or by writing their reply.
- 2) Use open ended questions such as 'What do you like playing?'; 'What did you dream last night?' or 'What's the difference between cats and sheep?'
- 3) When your child is confident answering your questions, they should have a go at writing their own questions for you to answer.

Extension

Write notes for your child occasionally, write about what you enjoyed playing with them, or what you are planning to do at the weekend. I wouldn't insist that the child replied, it's enough to let them experience the joy of receiving a note.

If you have family or friends who are willing to help out, you could ask them to write your child a letter too. It can be very exciting to receive post. It's really important for children to learn how to read handwriting as well as typed text, but less confident readers often find it easier to read words that aren't joined up, so it's worth starting with unjoined, slightly large writing.

Playdough Recipe

Equipment

This book,
Counters,
White board,
White board pen and eraser

- 1) Recipes are instructions, so they contain lots of Imperative Verbs - those are verbs telling the reader to do something. Read this recipe and lay a counter on top of each of the Imperative Verbs.

Ingredients

Plain Flour - 2 cups

Salt - 1 cup

Cream of Tartar - 2 tablespoons

Vegetable Oil - 2 tablespoons

Water - 2 cups

Food Colouring - optional

Method

- Measure 2 cups of plain flour and 1 cup of salt into a bowl.
 - Add 2 tablespoons of cream of tartar.
 - Carefully, stir the flour, salt and cream of tartar together.
 - In a jug, mix together 2 cups of warm water and 2 tablespoons of vegetable oil.
 - If you want to use food colouring, add a few drops to the water and oil mixture.
 - Now pour the water and oil into the flour mixture and stir it all together.
 - Pick it up with your hands and knead it.
 - You have made playdough!
- 2) Take it in turns to write an instruction on the white board and then follow the instruction together, for example, you could write 'jump', then both jump up and down.
 - 3) Start with a capital letter and write an exclamation mark after the Imperative Verb, 'Jump!'

Extension

If you have the ingredients, you could make the playdough. Try making the shapes of letters out of the playdough. Can you make some Imperative Verbs out of playdough?

The Animals had a Party

Equipment:

White board,

White board pen and eraser,

Ruler

- 1) Write the title at the top of the white board: The Animals had a Party.
- 2) Use the ruler to draw a straight line under the title.
- 3) Write about what happened at the party using compound sentences. Take it in turns to begin and end the sentences; e.g. the first player could write: 'The parrot hung balloons and'; the second player could add: 'the zebra carried the cake.'
- 4) Remember to use a capital letter at the beginning of every sentence and a full stop at the end.
- 5) What else happened at the party? Did the giraffe put up a banner? Did the monkey throw fruit? What did they eat? What games did they play?
- 6) When you've written a few sentences about the animals' party, go back through your writing and replace the 'and's between phrases with semicolons (;').
- 7) Play again, but this time make some bullet pointed lists. Like these:

The animals ate these foods:

- Fruit
- Cake
- Ice Cream

They played these games:

- Hide and Seek
- Who can climb the tree fastest
- Pin the tail on the lion

Extension

Choose a different book each and have a semicolon race. Who can find a semicolon first?

Complete the Word - Prefixes

Equipment:

White board,

White board pen and eraser,

Foam letters,

Dictionary

- 1) Put the letters 'un' on the board. How many words can you think of that start with 'un'?
- 2) See if you can use two 'un' words in one sentence. If you can come up with a sentence with three or more 'un' words in it, you're fantastic!
- 3) Once you've made your list, use your dictionary to find more words that start with the same prefix. Can you find any words you don't know?
- 4) Is there any pattern to what the words mean? For example, words that start with the prefix 'un' are usually saying not-something.
- 5) Here's a list of prefixes for you to work through. Don't try them all on one day! But, gradually work through the list and see how many words you can think of for each prefix.

dis, mis, in, il, im, irr, re, sub, inter, super, anti, auto

bi, aqua, aero, super, micro, audi, trans, prim, auto, tele, re, pre

Extension

Choose one of your own books and go on a prefix hunt. Choose two prefixes and see how many words you can find starting with those prefixes in the book (if it's a long book, just search through one chapter). Which prefix is most common?

Try another book and see if the same prefix is still the most common.

Rocks One

Equipment:

This book,

Counters

- 1) Identify all the nouns in the piece of writing below and put a counter on them.
- 2) Identify all the verbs, and place a counter on them.
- 3) Identify all the articles - 'a', 'an' and 'the' - and place a counter on them.

Rocks

A lot of rocks are grey, but some are different colours. Some rocks are striped. Most rocks are very dense, but some, like pumice, float in water. There are three main kinds of rock: metamorphic, sedimentary and igneous. Metamorphic rocks are made by squeezing rocks under great pressure and heat. A metamorphic rock is usually smooth. Sedimentary rocks are made when layers of sand fall on top of each other on the sea bed, over time these are squashed down to make hard rock. Sometimes an animal's body, or a plant, will fall between the layers of sand, then a fossil will be formed inside the sedimentary rock. Only sedimentary rocks can contain fossils. Igneous rocks are made when volcanoes explode and the molten rock, from inside the Earth, cools and forms rocks. Igneous rocks sometimes contain crystals.

Extension

Go on a rock hunt and see what rocks you can find. You can categorise rocks by their colour, their lustre (whether they are shiny or not), the size of the grains (can you see big or small lumps of colour in the rock), whether they contain crystals or fossils, and how hard they are. The mohs hardness scale ranks how hard rocks are by what they can be scratched with. Try to scratch your rock with all the things in this list, to get a rough idea of how hard your rock is:

Implement that leaves a scratch mark	Hardness of rock
Finger nail	1.5
Penny	3.5
Knife	5.5
Steel nail	7
Masonry drill bit	9.5

Homophones

Equipment:

White board,

White board pen and eraser

- 1) Some words sound the same but have different meanings, like bare and bear. Write 'Bear Feet', 'Bare Feet' on the white board and draw two different pictures underneath.
- 2) Try these homophone pairs: 'A Bridge To Wales', 'A Bridge, Two Whales';
'Which Hat?', 'Witch Hat!';
'So Many Cakes!'; 'Sew Many Cakes!'

Extension

See if you can come up with some homophone pairs of your own.

Here are some homophones to give you some ideas: there/their/they're, here/hear, quite/quiet, see/sea, one/won, sun/son, be/bee, blue/blew, night/knight
accept/except, affect/effect, ball/bawl, berry/bury, brake/break, fair/fare, grate/great, groan/grown,
here/hear, heel/heal/he'll, knot/not, mail/male, main/mane, meat/meet, medal/meddle, missed/mist,
peace/piece, plain/plane, rain/rein/reign, scene/seen, weather/whether, whose/who's

Complete the Word - Suffixes

Equipment:

White board,

White board pen and eraser,

Foam letters,

Dictionary

- 1) Write two suffixes on the white board. Can you think of some root words that can be put in front of them? (If you get very stuck, there's a list of root words at the bottom of the page for you to try - can you work out which suffixes they work with?)
- 2) Can you think of one root word that can be put in front of both suffixes?
- 3) Be careful - some root words change their spelling when you put a suffix on them, for example, 'beauty' + '-ful' = 'beautiful'. If you're not sure if your word is valid, use your dictionary to check.
- 4) When you have some lists, see if you can find any patterns. For example, words that end with '-ing' are often verbs in the present tense. Words that end with '-er' are often comparative adjectives. Words that end with '-ness' are often nouns that have been made from adjectives. Words that end with '-ly' are often adverbs.
- 5) Have a go at making a sentence with as many words with the same suffixes as you can.

Here's the list of suffixes to work through:

-ing, -ed, -er, -est, -ment, -less, -ful, -ness, -ly, -ous.

Extension:

Make a venn diagram showing words that can be used with different suffixes.

Here's a list of root words to try:

Walk, Teach, Bright, Enjoy, Harm, Hope, Happy (be careful with the spelling), Slow, Glory (be careful with the spelling), Joy.

Mad Libs One

Equipment:

White board,

White board pen and eraser,

Dictionary

- 1) Make a list on your white board, of all these words (be careful to write them in the correct order):

Noun

Verb in the present tense (they frequently end with -ing)

Adjective

Adverb

Noun

Verb in the imperative tense (telling someone to do something)

Verb in the present tense

Noun

- 2) The adult should read the story below, every time you get to a gap, the child should read the next one of the words from your board. You might want to tick them off when you've read them so that you don't lose track of where you are.

Every morning when I wake up, I get out of my _____.

Then I start _____ - it's my favourite way to begin the day.

I put on my _____ clothes, because they look fantastic.

Sometimes, my _____ comes and says, "Come on, it's time to _____."

But, other days, I just get on with _____, which is much more fun.

Then it's time for breakfast, and I love to eat _____.

- 3) Rub out all your words and have another go. If you get stuck and aren't sure if the word you've chosen is the right kind of word, check in your dictionary.

Extension

Have a go at writing your own mad libs. The easiest way is to write a simple story, then take out a word from every sentence, and write down what type of word it was. When you've got your list of parts of speech, ask your partner to write down one word for each of them, and read your story aloud - filling in the blanks with your partner's selections as you go.

Evolution

Equipment:
Counters

- 1) Read the text below. Put a red counter on each of the pronouns (he, she, it, they, this).
- 2) Put a blue counter on each of the Proper Nouns (names).

Evolution is a Scientific Theory - that is an explanation for one aspect of the world, based on a variety of observations and experiments.

Evolution aims to explain how different types of living things have changed over time.

Imagine the first giraffe born with a long neck. Its long neck would help it to reach leaves that were higher up in trees, and to see predators from further away than the other giraffes could. So, the longer necked giraffe would live longer than the other giraffes and have more children. This is called Natural Selection. These baby giraffes would be more likely to have longer necks too. Over time, the giraffes with longer necks would have far more children than the giraffes with shorter necks, and eventually, there would only be giraffes with longer necks.

Charles Darwin proposed the theory of evolution in his famous book called 'On the Origin of Species'. He lived in the nineteenth century, when railways were invented and Charles Dickens wrote 'A Christmas Carol'.

In the 1960's, when the first person walked on the moon, Rosalind Franklin discovered the structure of DNA. This is a code inside cells, which allows messages to be passed from one generation to the next.

Most evolution happens too slowly for us to observe more than glimpses of it, so scientists often study animals with very short life cycles, so that they can observe lots of generations. In Columbia University, they studied fruit flies for this reason.

Extension

If you can, visit a natural history museum or a zoo or farm park and have a look at the animals. How are they adapted for their environment?

Complete the Poem Two

Equipment:

This book,

White board,

White board pen and eraser

- 1) Not all poems are structured around rhyme. Some poems are structured around rhythm. Haikus, for example, have a line of five syllables followed by a line of seven syllables and then another line of five syllables. Count the syllables in the haiku below:

Birds flutter outside,
Squabbling over seeds I left,
I tried to be kind.

- 2) Have a go at completing this haiku. It doesn't have to rhyme, but it does need to have the correct number of syllables:

Winter trees are bare,
Spring covers them with green buds,
Summer _____

- 3) Try writing your own haiku.

Extension

Haikus come from Japan. They are often accompanied by ink drawings. If you have ink, or black paint, try to illustrate your haiku.

Complex Sentences

Equipment:

White board,

White board pen and eraser,

Foam letters

- 1) Sometimes sub clauses add detail, but sometimes they change the meaning of the first part of the sentence. For example, 'Today's my birthday' is a positive sentence; if we add the sub clause 'but nobody remembered', it changes the mood.
- 2) Write 'I love cake' on the whiteboard.
- 3) Add 'but' with the foam letters, and think of your own way of adding a twist to the sentence. Don't forget to finish your sentence with an appropriate mark - a full stop(.), an exclamation mark (!), or a question mark (?).
- 4) Now try doing the same with these sentences:

'Sam is my friend'

'I'm great at writing'
- 5) Take down the foam 'but's. Put up 'when's in foam letters and read how your sentences sound now. Do they still make sense?
- 6) Switch the 'when's for 'if's and see if the sentences work now.
- 7) Rub it all out. Now take it in turns to come up with sentence starters and sentence enders, use 'because' to join the two parts together.
- 8) Take down 'because' and switch it for 'or', and then for 'that'.

Extension

Use your favourite sentence to start a short story. The mood should be set by your opening sentence. Is it a funny story, a sad story, a mysterious story?

Dictionary Race

Equipment:

Dictionary,

White board,

White board pen and eraser,

Counters

- 1) Take it in turns to flick through the dictionary and find a new word that you don't know.
- 2) Write the word on the white board.
- 3) Now the race begins, can the person who found the word write a definition on the white board before their partner finds the word in the dictionary and reads the definition aloud? (A lot of words have more than one definition, you only need to write one of them down, otherwise the writer would never manage to win.)
- 4) When you've played a few times, you should know lots of words! So, try this version: take it in turns to pick a new word from the dictionary, write the word on the white board. The other player has to guess what the word means. If they're right, they get a counter; if they're wrong the word-finder gets a counter. Play a few rounds and see who gets the most counters.

Extension

Get out a reference book, and flick through that until you find a word that you don't know. Ask your partner to guess what the word might mean, using the context in the book, e.g. if the new word is 'vermillion' and the book says 'Vermilion Flycatchers get their name from their bright red plumage', you might well guess that vermillion means red. Once your partner has said their guess, look the word up in the dictionary to check. If their guess is right, they get a counter; if their guess is wrong, you get a counter.

Guess How Long

Equipment:

Calendar,

White board,

White board pen and eraser

- 1) Get out the calendar, set the calendar to today's date, and set the clock to the right time.
- 2) You're going to write a poem about the months of the year, with one line for each month. Guess how what time it will be when you have finished your poem. Set the wooden clock to your guess.
- 3) Now write your poem. Start each line with the name of a month, then write something about that month. Here's mine:

January is cold, and the mornings are dark.
February is still cold, the wind blows through the park.
March can get warmer, it's the start of spring.
April can be Easter, and chocolate eggs bring.
May means that there's blossom on the trees.
June is when there are bees and flowers to see.
July can be warm, a good time for ice cream.
August is time to jump in a cold sea and scream.
September is when the evenings grow dark again.
October brings pumpkins and mud when it rains.
November is when fireworks fill the sky.
December has Christmas and lots of mince pies.

- 4) Look at a real clock, or watch to find out the time. How close was your guess?

Extension

Can you think of some other things to time? Guess how long it takes to watch your favourite TV show, or have a bath, or how long it would take you to draw a picture of your family. Do you get better at guessing how long things will take if you practise?

Mad libs Two

Equipment:

White board,

White board pen and eraser,

Dictionary.

- 1) Make a list on your white board, of all these words or phrases (be careful to write them in the correct order):

Adjective

Verb in the infinitive form ('to see', 'to draw' etc.)

Noun

Fronted adverbial (an adverbial phrase - describing, how, when, or why someone did something, to go at the beginning of a sentence, e.g. 'With all my heart,' or 'First thing in the morning,' or 'Because I was afraid of water,' - it should always end with a comma.)

Preposition (e.g. under, over, on etc.)

Plural noun

Modal verb (a word that comes before a verb to qualify the action e.g. could, would, will, should)

Adverb

Expanded noun phrase (a noun with at least one adjective - use as many as you like)

- 2) The adult should read the story below, every time you get to a gap, the child should read the next one of the words from your board. You might want to tick them off when you've read them so that you don't lose track of where you are.

Yesterday, I was feeling a bit _____. So, I decided that the best thing to do
was _____. I needed my _____ to get started.
_____, I started looking for it.
I looked _____ all the _____, but I still couldn't find it.
I realised that I _____ stop looking and _____ play instead.
So I took out my _____ and played with it in the garden.

- 3) Rub out all your words and have another go. If you get stuck and aren't sure if the word you've chosen is the right kind of word, check in your dictionary.

Extension

Have a go at writing your own mad libs. The easiest way is to write a simple story, then take out a word from every sentence, and write down what type of word it was. When you've got your list of parts of speech, ask your partner to write down one word for each of them, and read your story aloud - filling in the blanks with your partner's selections as you go.

Numeracy

Investigating Scales

Equipment:

Frog Scales

Wooden Animals

- 1) Get out the Frog Scales. Pick any number from the plastic number shapes and put it on one side of the scale. Count how many frogs it takes to balance the scale.
- 2) Pick two numbers and count out how many frogs it takes to balance them both.
- 3) Put one of the wooden animals on one side of the scale, count how many frogs it takes to balance the wooden animal. Do you have enough frogs to balance all the wooden animals?
- 4) Take it in turns to put frogs on one side of the scale, and see if your partner can put down the right plastic number or numbers to balance the frogs.

Extension:

Find some small toys or items of stationary around the house. Guess how many frogs they will weigh, then experiment to see if you were right.

Introducing the Shapes

Equipment:

Geometry shapes

World map

- 1) Pick up the shapes and tell the child their names: cylinder, cube, cone, triangular prism.
- 2) Lay them all out on a table.
- 3) Cover the shapes with the world map. Under cover of the map, remove one of the shapes.
- 4) Uncover the shapes and ask the child to guess which one you have taken away.

Extension

Have a shape hunt around your house. How many things can you find that match each of your shapes? Is one of the shapes a lot easier to find than the others?

Speed Counting One

Equipment

Frogs from the balance kit

- 1) Take it in turns to put a pile of frogs on the table, the other person must count the frogs, and say the total number as quickly as possible. (NB. begin with just one or two frogs, the aim of the game is to count the frogs, without counting them out '1, 2, 3' etc. At first, your child may only be able to count one or two in this manner.)
- 2) Play again, but this time, the counter must close their eyes, giving the frog placer time to put the frogs down in a pattern. It doesn't matter much what pattern you use, but you could use the same pattern as the spots on a die. Most people find it easier to quickly count frogs if they are laid out in a pattern. See how many you can Speed Count now.
- 3) Next try this two round version. The frog placer arranges frogs in a pattern; the counter looks and counts as quickly as they can; then they close their eyes again and the frog placer removes a number of frogs, or adds some; the counter looks again and sees how quickly they can count the new total - is it quicker than the first time?

Extension

Try speed counting with other toys, or books, or even cutlery. How quickly can you count whether enough places have been laid at the table?

Lines

Equipment:

Ruler,

White board,

White board pen and eraser

- 1) Can you draw a straight line on the white board by pushing the pen against the side of the ruler?
- 2) Once you've got one straight line, try to draw lines on both sides of the ruler. You should have two parallel lines, like train tracks.
- 3) Pretend your parallel lines are a path. Draw some perpendicular lines sticking up from your path, then add leaves to them to make them look like trees along the path.
- 4) Draw a pair of perpendicular lines sticking up from your path. Then join them at the top to make a rectangle. Add a roof, windows and a door, to make a house.
- 5) Can you think of anything else to add to your picture?

Extension

If you have some paper and coloured pencils, you could make some more pictures starting with straight lines.

Sort the Shapes

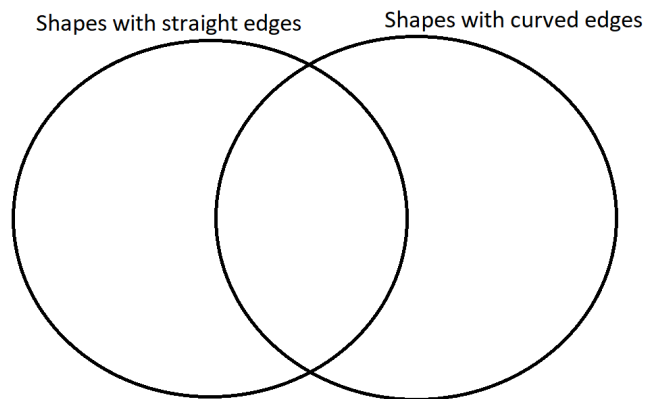
Equipment:

Geometric shapes

- 1) Get the shapes out and sort them into groups. First sort them into those with curved edges and those with only straight edges.
- 2) Next sort them into small, medium and large.
- 3) Next sort them into colours.
- 4) Can you think of any other ways of sorting the shapes?

Extension

Draw a venn diagram and put the shapes where they belong (if shapes have both straight and curved edges they belong in the overlap). If you have compasses, you could show your child how to use these to draw circles.



Treasure Hunt

Equipment:

Map

Counters

- 1) Take it in turns. The first player - without letting the second player see - puts one yellow counter on one of the squares of the map, this counter is the treasure; and puts three green counters on three other squares of the map, these counters are the snakes.
- 2) The second player guesses a square by saying a letter and a number.
- 3) If they find the treasure before they have found all three snakes, the second player wins. But, if they find all three snakes before they find the treasure, the first player wins.

Extension

The Second Player might find it helpful to write down the squares that they have guessed, so they don't waste time by guessing the same squares over and over.

If you can persuade anyone else to join in, have a Third Player take guessing turns with the Second Player for a bit more competition. Whoever finds the treasure first wins, but if the snakes are found first, then the First Player wins.

Speed Counting Two

Equipment

Frogs from the balance kit

White board

White board pen and eraser

- 1) When adding groups together, it's quicker if you don't count out every single item again. Start by putting down a small pile of four frogs and counting them together, now put down one more frog, how many are there now? Can you count on from four, rather than starting at one again?
- 2) Now start with ten frogs and add another two. It's much quicker to say 'eleven, twelve,' than it is to start all over again with '1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.'
- 3) Continue with different numbers of groups of frogs, until you are comfortable counting on, rather than starting again at one each time.
- 4) Take it in turns to place frogs and to guess. The frog placer should lay down two piles of frogs and tell the counter how many are in each pile. The counter has to say the total number of frogs in both piles as quickly as possible (NB. just like with Speed Counting One, the aim is to get straight to the total, rather than count out '1, 2, 3,' etc. so, begin by adding only a few frogs).
- 5) Rather than having piles of frogs, try writing the numbers on the board: ' $3+2=$ ' can you Speed Count the answer? Take it in turns to write sums and to solve them.
- 6) Once your child has mastered Speed Counting, try setting a run of problems where the answer is always ten: $6+4$, $5+5$, $3+7$. Talk about the different ways of making the number ten. We call these pairs 'number bonds'.

Extension

Write the number bonds to ten out on a piece of paper and stick it up somewhere you can see it. If you can learn these by heart, it will help with maths.

Once you've learned them, you could try and find the number bonds to twenty and learn them too.

Begin Adding

Equipment:

Counters

Number grid

- 1) We can use a number grid to help us add numbers together.
- 2) Take six counters and three counters. Lay them out on the number grid, one on each square, starting at one. The counters should end on square nine.
- 3) Try using a few different combinations of counters.
- 4) We don't have to count out the groups again. If we want to add three to six, we can start with the number after six. Lay out three counters, starting on seven (you'll land on nine, again).
- 5) Try some more sums like this. The bigger the number, the more time you save by counting on, rather than laying out all the counters. Try adding four to fifteen.

Extension

Write out a long numberline and try counting on using that instead. You could use one of the frogs from the balance kit to 'hop' up the numberline. You can use any paper for a number line, but if you have a long roll of paper that can be a lot of fun. You could even make a huge numberline using pieces of paper taped together and walk up it to add.

Then have a go at taking away by walking (or hopping your toy) back down the numberline.

Favourite Type of Book

Equipment:

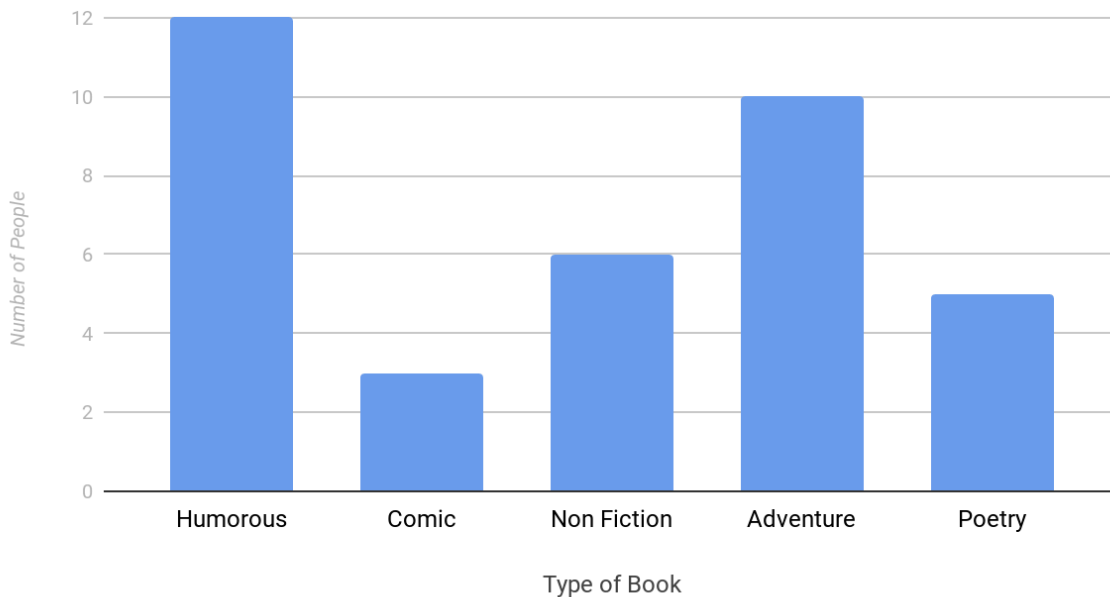
Squared white board,

White board pen and eraser,

Ruler.

- 1) Here is a bar chart showing the favourite types of books of some of my friends. Have a look and see if you can answer the questions below:

Favourite Types of Book



- 2) Which type of book is the most popular? How many people did I ask altogether? Which type of book is the least popular? Which two types of books are equally popular?
- 3) Do your own survey. Record your results in a table, then make a bar chart of your results. Maybe you could do a survey of finger lengths in your household, by measuring everyone's fingers.

Extension

Have a look at all the types of books in the library, read one of each type, and decide which one is your favourite.

Measure the Shapes

Equipment:

Ruler

Geometric shapes

White board

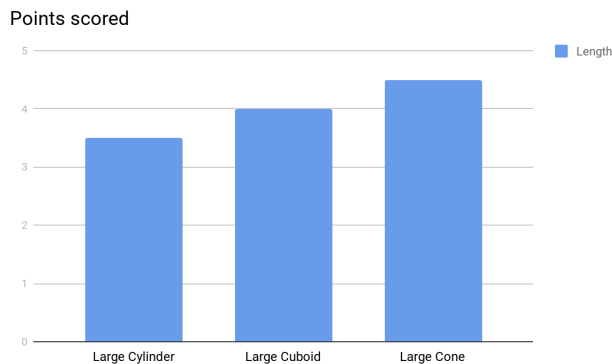
Squared white board

White board pen and eraser

- 1) Use the ruler to measure the length of each shape. Write down the lengths on the white board in a table like this:

Name of Shape	Length in cm
Large Cylinder	
Large Cuboid	
Large Cone	

- 2) Use the squared board to make a bar chart showing the information from your table.



- 3) Use the ruler to measure the width of each shape and add a new column to your table to show that information.
- 4) Rub out your bar chart and plot a line graph of width against length for your shapes.

Extension

If you have a tape measure you could also measure the circumferences of your rounded shapes.

Board Game

Equipment:
Number grid,
Foam die,
Counters

- 1) Choose a counter each and put them on the number one.
- 2) Take it in turns to roll the die and move that number of spaces forward.
- 3) The winner is the first person to get to 100.
- 4) If you roll past 100, go backwards, you have to land exactly on 100 to win, (e.g. if you were on 99 and rolled three, you would count one forward to 100, then two back, landing on 98).

Extension

Add some rules of your own, to make the game more fun. For example if you land on your age, you get to roll again; or if you land on a number with '2' in it you have to move backwards one your next go.

Speed Compare

Equipment:

Counters,

White board,

White board pen and eraser

- 1) Lay the white board down on the table. Put a pile of three counters on the left of the board and six counters on the right of the board. Which pile is bigger?
- 2) The right side has the bigger pile, so write this symbol on the board: $<$
- 3) Now put five counters on the left of the board and two counters on the right. Which pile is bigger?
- 4) The left side has the bigger pile, so write this symbol on the board: $>$
- 5) Now put four counters on each side of the board. Both piles are the same, so write this symbol on the board: $=$
- 6) Take it in turns to lay out the piles or to compare the sizes and write the correct symbol as quickly as you can.
- 7) If you have trouble remembering which way round it goes, you can think of the 'greater than' and 'less than' symbols as like greedy mouths, always open to gobble up the biggest number.

Extension

If you have cups, mugs and bowls of different sizes, try pouring different amounts of water into them and see if your partner can guess which container is holding the most water.

Begin Timesing

Equipment

Counters

Numbergrid

- 1) Make four piles of two counters. How many counters do you have altogether? Lay them out in four columns of two and count out the eight counters. Four times two is eight.
- 2) Now put two counters on the number grid covering the numbers 1 and 2.
- 3) Choose two counters in a different colour and use them to cover the numbers 3 and 4.
- 4) Keep going, alternating the colours every two counters, until the entire grid is covered. The grid now shows the two times table. Read the two times table together: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 etc. Notice how the digits 1, 3, 5, 7, and 9 never occur at the end of the numbers. We call all the numbers in the two times table even; you can split them into two groups and they will balance. All the numbers not in the two times table are odd.
- 5) Clear the number grid. Then make four piles of five counters. How many counters do you have altogether? Lay them out in four columns of five and count out the twenty counters. Four times five is twenty.
- 6) Now put five counters on the number grid, covering the numbers 1, 2, 3, 4 and 5. Keep going, alternating the colours every five counters, until the entire grid is covered. Now the grid shows the five times table.
- 7) Finally, clear the grid again, then do the same thing with the ten times table.
- 8) The ten times table is one of the easiest to remember. Make piles of ten counters and have a go at counting in tens: 10, 20, 30, 40 etc. It's much quicker than counting every single counter!
- 9) When your child is confident counting in tens, try counting in fives, and then in twos.

Extension

If you have a pot of coins, try making piles of 10p and counting in tens - every ten piles makes one pound.

Rounding

Equipment:
Counters,
Number grid

- 1) Put a counter on the number '3' on the number grid. Which is it closest to: 0 or 10? NB you have to imagine the zero, it belongs to the left of the one.
- 2) Now put the counter on the number '7' on the number grid. Which is it closest to: 0 or 10?
- 3) We call this 'rounding to the nearest 10.' We take a number and say which number in the ten times table it is closest to. Now put a counter on the number '5', which is this closest to: 0 or 10? It's exactly in the middle. When this happens, we always round up, so 5 to the nearest 10 is 10; 25 to the nearest 10 is 30; 385 to the nearest 10 is 390.
- 4) Have a go at rounding these numbers to the nearest ten, you can use the number grid if you need to: 67; 4; 89; 75; 22; 31.
- 5) Can you round to the nearest hundred? The number grid doesn't go higher than 100, so you'll have to try without it. Try these: 234; 199; 101; 89; 3.

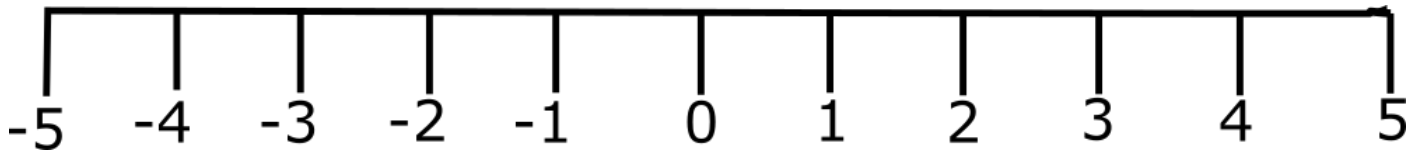
Extension

Try rounding some real life numbers. Get a recipe book and round all the weights to the nearest ten, and to the nearest 100. If you're feeling bold, try cooking your rounded recipe. Does it make much difference?

Negative Numbers

Equipment:
Counters

- 1) Put the counter on '0' on the number line below. Add five, by jumping the counter five to the right.



- 2) Take away three, by jumping the counter three to the left.
- 3) Take away two, by jumping the counter two to the left.
- 4) Now take away one more, jump the counter one to the left, past zero and onto '-1'. If you take away one more than you have, you get a negative number.
- 5) See if you can use the number line to answer these sums: $4 - 7$; $5 - 10$; $3 - 8$; $-3 - 2$; $-2 + 4$

Extension

If you can, make your own giant numberline, using chalk on your driveway or patio, try doing the sums using yourself as a giant counter.

You could also ice a numberline onto a swiss roll and use a sweet as a counter.

Animal Picnic

Equipment:

Wooden animals,
Counters

- 1) Pick your two favourite animals. They're going to have a picnic.
- 2) First they have four sandwiches to share. Take four counters and share them fairly between the two animals. How many does each get?
- 3) Now they have six tomatoes to share. Take six counters and share them fairly. How many does each animal get?
- 4) They have two packets of crisps. Share two counters between the animals.
- 5) They have eight biscuits. Share eight counters.
- 6) Finally, the animals have fourteen grapes. Share fourteen grapes between the two animals. How many grapes does each eat?
- 7) Have another picnic, for three animals. They have six sandwiches, nine tomatoes, three packets of crisps, twenty one biscuits and thirty grapes.
- 8) Hold a picnic for four animals. Share out eight sandwiches, twelve tomatoes, four packets of crisps, sixteen biscuits, and twenty grapes.

Extension

If you have a packet of sweets, you can hold a real picnic. Try sharing them between two animals first, then three, then four. If you have any remainders - you should eat them. At the end of the pretend picnic, you should eat all the sweets.

Square Numbers

Equipment:

Counters

- 1) Get out the counters, what shape are they? They're squares. If you lay four squares together, with their edges touching, you should be able to make a big square. Can you do that?
- 2) If you lay nine squares together, you should be able to make another big square. Try to do that.
- 3) Four and nine are square numbers. They are the result of one number multiplied by itself, $2 \times 2 = 4$, $3 \times 3 = 9$. Can you find the next square number? (You can find all the square numbers up to 10×10 with your counters.)
- 4) You don't have to build a new square each time, you can move from one square to the next just by giving your square one more row and one more column.

Extension

If you have some cardboard, you can make yourself some cardboard cubes, and demonstrate cubic numbers. Make eight cubes. You can build your small cubes into a big cube by making one square of cubes, two wide and two long, then putting an identical square on top. You will now have a cube that is two high, two wide, two long, made up of eight smaller cubes. $2 \times 2 \times 2 = 8$. The next cube number is 27 ($3 \times 3 \times 3$), which is rather a lot of cubes to make, but, if you have a box of sugar cubes, or a big box of blocks, you might be able to build it!

Name the Shapes

Equipment

Geometric shapes,

Globe,

White board,

Foam letters

- 1) Get out the geometric shapes and remind yourselves of what they're all called. The globe is a sphere.
- 2) Give each of the shapes an alliterative name (a name that begins with the same sound as the type of shape, e.g. Cyril Cylinder).
- 3) Use the foam letters to write the shapes' names on the whiteboard.
- 4) Use the geometric shapes to build a tower. Which shapes make the best base?
- 5) What else can you build from the shapes?
- 6) Try to build an animal and see if your partner can guess what animal you have built.
- 7) Tell this shape story, while your child uses the shapes to act it out.
- 8) Encourage your child to tell a shape story, while you act it out with the shapes.

Little Cube lived with her Mummy Cube and her Daddy Cube. Little Cube went out to play. She knocked on the door of her friend Little Cylinder. Little Cylinder's big sister opened the door.

"Hello," said Medium Cylinder.

"Can Little Cylinder come out to play?" asked Little Cube.

Daddy Cylinder said that it was ok, so Little Cylinder and Little Cube played in the garden. They jumped and span. Then Little Cone came out to play with them. They all jumped together until - oh, no! Little Cone jumped too high and got stuck in a tree.

Little Cube climbed on top of Little Cylinder, but they were still too short to reach Little Cone.

Luckily, Medium Cylinder came out to play too and she saw what had happened. So, Little Cylinder climbed on top of Medium Cylinder and Little Cube climbed on top of Little Cylinder and then they could reach Little Cone and disentangle the tree branches. Phew!

Extension

You could draw your shape story as a comic strip. Or, if you have access to a smart phone, you could have a go at making a stop-animation movie of your shape story. Try to include the shapes' features in the story, the cylinder could roll down a hill, the cone could fall spike first into a big cheese and get stuck.

Slow Compare

Equipment:

Wooden animals,
Ruler,
White board,
White board pen and eraser

- 1) Choose three animals. Guess which one is the shortest and which one is the tallest.
- 2) Use the ruler to measure all the animals and see if you were right.
- 3) Write your results on the board, using '<' and '>' symbols.
- 4) Take the rest of your animals out of the box, one by one. Try to guess how tall they are, then check with the ruler.
- 5) Measure the rest of your animals and write them all up on the board. If two are the same height you should put the '=' symbol between them.

Extension

Find some more of your toys, guess how tall they are, then check with the ruler. If you have a tape measure, you could also measure the circumference of your toys.

Animal Walk

Equipment:

Squared white board,

White board pen and eraser,

Ruler,

Wooden animals

- 1) Draw a rectangle on the white board: two squares by four squares.
- 2) Count how many squares are inside the rectangle.
- 3) Choose a wooden animal and make it walk around the edge of the rectangle, how many square lengths does it walk?
- 4) Now draw another rectangle: one square by eight squares.
- 5) Count how many squares are inside the rectangle.
- 6) Choose a wooden animal and make it walk around the edge of the rectangle, how many square lengths does it walk? Even though the area of the rectangles is the same (8), the perimeters are not (10 and 18).
- 7) Can you draw another shape with an area of eight squares? Maybe you could draw a 'T' shape or an 'L' shape. What perimeter does your shape have?
- 8) See how many shapes you can make with six squares. Which one has the longest perimeter?

Extension

Use the ruler to draw triangles, estimate their area by counting roughly how many squares are inside, and use the ruler to measure the perimeters.

If you have a piece of string, you can draw circles and measure their circumferences. Wrap the string around the shape; draw a mark on the string to show how much string you needed to get all the way around; then hold the string against the ruler to measure how long the circumference is.

Times Table Hunt

Equipment:
Number Square
Counters

- 1) Two Times Table. Put one counter on two and one on four. Continue putting your counters down until the entire two times table is covered. What do you notice about the counters? What pattern do they make? Put a different coloured counter on top of the four, the eight and so on, covering every other one of the counters that you have laid down - that's the four times table. If you cover the eight, the sixteen, and so on, covering every other pile of two counters you will have three counters on top of every number in the eight times table.
- 2) Take all those counters off and start over, putting one counter on three, one on six, and so on, covering every third counter, then you will have covered the three times table. There aren't columns like there were with the two times table, but the counters still make a pattern. If you put the two times table down again, you will see that every number with two counters on it is in the six times table.
- 3) Take all those counters off and start over. Try putting counters on all the numbers in the five times table. What do you notice? All the numbers in the five times table end with one of two possible digits, what are they? Notice that the five times table makes columns again. If you put counters on ten, and then every other number in the five times table, you'll discover the single column of the ten times table.
- 4) Take all those counters off and start over. Starting with eleven, count out eleven and lay down the counters to show the eleven times table.
- 5) Take all those counters off and start over. If you lay out the three and the four times tables, the numbers where they meet will be the twelve times table.
- 6) When you've looked at the patterns made by all the different times tables up to twelve, try putting one counter on every number in the two times table, then one on every number in the three times table (but, don't put a second one on top of any numbers also in the two times table). If you keep going until all the numbers in a times table are covered by a single counter, the uncovered numbers are called Prime Numbers, what you just did is called the Sieve of Eratosthenes, it's a simple method for discovering prime numbers.

Extension:

Copy out one of the times tables onto a piece of paper and stick it up somewhere you will see it. If you practise every day, you will be able to memorise your times tables, which will be very helpful for maths problems later. It's easiest to try and learn only one times table at a time. But, remember that 3×4 is the same as 4×3 , so once you've learned one times table, you'll have fewer sums to learn in the next one! If you were to learn all your times tables up to twelve, by the time you get to the twelfth one, you'll only have one sum left to learn, because all the rest are in your other tables!

Animal Picnic 2

Equipment:

Wooden animals,
Squared white board,
White board pen and eraser,
Ruler,
Protractor.

- 1) The animals are having a picnic, but they've only brought big cakes. Can you help them to share it?
Choose two animals.
- 2) Draw these three cakes on the white board:
- 3) Use the ruler to draw a straight line where you could cut the cakes to share it fairly.
- 4) Rub out your straight lines. Redraw the cakes. Pick another two animals to join the picnic.
- 5) Can you use the ruler to draw straight lines where you could cut the cakes to share them fairly amongst four animals?
- 6) You can use a protractor to fairly share a circular cake. Four animals will each get 90° ; five animals will each get 72° ; six animals will each get 60° .
- 7) Each animal gets to eat a fraction of the cake. We can show fractions - numbers less than one - by writing how many pieces the one was cut into on the bottom and how many pieces each animal gets on the top. If a cake is cut into three pieces and each animal gets one of those pieces, each animal gets $\frac{1}{3}$ of the cake. How much cake does each animal get, if the cake is cut into four pieces?
 $\frac{\quad}{4}$

Extension

If you are eating a cake or pie, let your child cut it up into pieces - they could use a protractor to help ensure that the pieces are fair.

Divide Your Time

Equipment:

Counters,

White board,

White board pen and eraser,

Protractor,

Ruler

- 1) Count out twenty four hours, to represent the twenty four hours of your day.
- 2) Estimate how you spent those hours yesterday.
- 3) Write down the numbers of hours you spend in different ways, e.g. 9 hours asleep, 1 hour eating, 3 hours learning, 1 hour exercising, 2 hours doing chores, 1 hour watching TV, 2 hours reading, 6 hours playing in the garden.
- 4) Make a pie chart of your day, using the protractor. First, draw a circle - if you have a small plate to draw around, you will get a very neat circle.
- 5) Then draw one straight line from the middle of the circle to the top.
- 6) Now you need to use the protractor to measure out your first segment. There are 360° in a circle and 24 hours in a day, so each hour equates to 15° . In my example, the nine hours asleep would turn into $9 \times 15 = 135^\circ$.

Extension

You could keep a diary for a day to see exactly how you spend your hours. Was your estimate close?

If you have access to a computer, you could use a spreadsheet program to draw a pie chart of your hours.

Shapes by Touch

Equipment:

Geometric shapes,

World map

- 1) Take it in turns to hide a shape under the map. Your partner feels the shape through the map and tries to guess which one it is. Then, remove the map, and see if they were right.
- 2) Try a slightly trickier round, hide a shape under the map and see if your partner can guess what the shape is, just by looking at the shape of the lump under the map.

Extension

If you have some foil, make an imprint of the shape in a piece of foil and see if your partner can guess the shape that made the imprint.

Ten Times Table

Equipment:

Squared white board,

White board pen and eraser

- 1) Make these columns on your squared white board:

H T U

'H' is for Hundreds, 'T' is for Tens, 'U' is for Units (ones).

- 2) Put one in the units column:

H T U
 1

- 3) To times one by ten, just move it one column to the left, so it's in the tens column and fill in the gap it left in the units column with a zero:

 H T U
 1
x10 1 0

- 4) Rub out what you've done and put 2 in the units column. Can you multiply two by ten?

- 5) Once you've got the hang of multiplying single digit numbers by ten, you can try two digit numbers. Let's try twelve. Write the 1 in the tens column and the 2 in the units column:

H T U
 1 2

- 6) To multiply twelve by ten, move the 1 into the hundreds column and the 2 into the tens column. Then fill in the gap in the units column with a zero:

 H T U
 1 2
x10 1 2 0

Try doing this with some other two digit numbers.

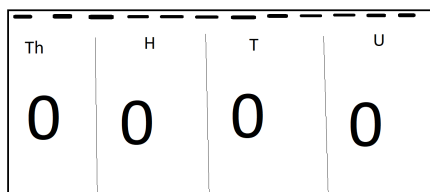
- 7) To divide by ten you go back the other way, and take off the spare zero from the units column:

 H T U
 2 7 0
÷10 2 7

- 8) Once you're happy with this, you could try adding a 'Th' for Thousands column, a 'TT' for Tens of Thousands column, a 'HT' for Hundreds of Thousands column and an 'M' for Millions column.

Extension:

If you have paper, a stapler and some scissors, you can make a place value book. Fold five sheets of A4 paper in half lengthways. Staple along the fold. Now cut from the unfolded side upwards to get four equal flaps. Write 'Th', 'H', 'T' and 'U' along the top of the flaps. On the top flap write '0' under each of the letters:



Lift up the flaps and write 'Th', 'H', 'T' and 'U', again; under each of the letters, write '1'. Then lift the flaps and repeat, writing '2' under the letters this time. Keep going until all the digits have been written on separate flaps of paper. You now have a place value book. You can use it to practice adding, subtracting, or multiplying by ten.

The reason the ten times table works like this is that we count in base ten (we only use ten digits so every ten numbers we need to shift into a new column). Sometimes - usually when programming computers - people count in base two (binary) or base sixteen (hexadecimal). Base two only has two digits '1' and '0', so the number one is written as '1', but the number two is written as '10', the number three is written as '11', how do you think four is written in base two? In base sixteen, there are sixteen digits: '0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, f'. All the numbers up to nine, are written the same way as in base ten, but the number eleven is written as 'a', twelve is 'b'. How do you think the number thirteen is written in base sixteen?

Symmetrical Drawings and Tessellations

Equipment:

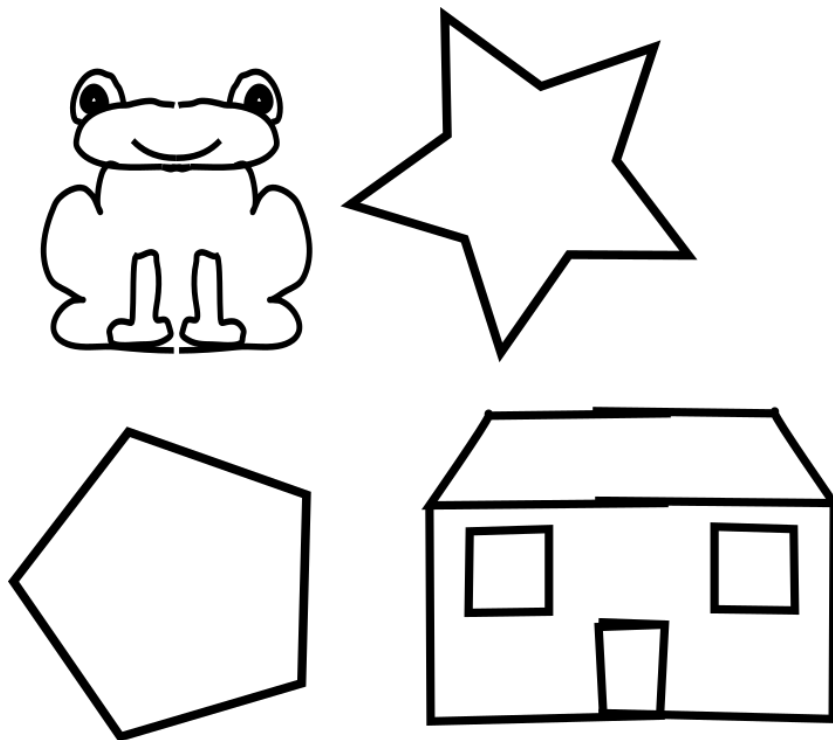
Counters,

Ruler,

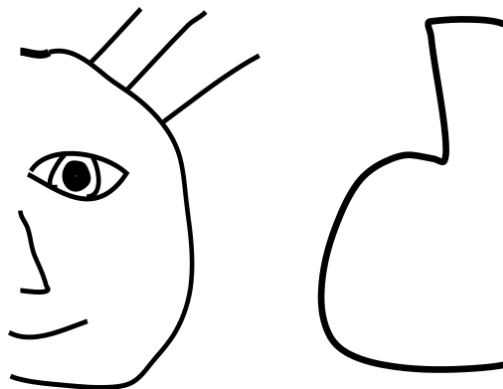
Squared white board,

White board pen and eraser

- 1) When you lay your counters out in a pattern, you can lay them down so that all the edges touch and there are no gaps between counters. That is called a tessellating pattern. Can you make a tessellating pattern with the counters?
- 2) Look at these drawings. Can you find their lines of symmetry? Use your ruler to show where the lines are.



- 3) Copy these shapes onto the white board. Then double them to make symmetrical shapes.



Extension

If you have some paint and some paper, try this symmetry painting. Fold a piece of paper in half. Paint a simple pattern on one side, be quite generous with the paint. Then fold the paper in half and press down. Unfold the paper again, and you should see a symmetrical painting.

Frog Balance Two

Equipment:

Frog balance,

Squared white board,

White board pen and eraser

- 1) Use the frogs to show 3×2 on one side of the balance.
- 2) Use the numbers to show $5 + 1$ on the other side of the balance.
- 3) Since $3 \times 2 = 5 + 1$, the sides should balance!
- 4) Now try $3 + 2$ on one side and 5×1 on the other side. Since $3 + 2 = 5 \times 1$, the sides should balance again.
- 5) Can you think of an addition sum that gives the same answer as 3×6 ?
- 6) Put 3×6 frogs on one side of the balance and add your numbers on the other side and see if the scales balance.
- 7) Can you make two sums that balance one another?
- 8) Take it in turns to put a number of frogs on one side of the balance and think of a sum that gives that answer to put on the other side of the balance (you'll have to be careful not to use very big numbers because there are only so many frogs!).
- 9) Take it in turns to write a sum on the white board with '=' after it. The other player should write another sum that would give the same answer. Now your numbers can get as big as you can calculate!

Extension

If you have lots of identical toys at home, e.g. lego bricks, you might be able to do balance maths with bigger numbers.

Adding Big Numbers

Equipment

Squared white board

White board pen and eraser

- 1) Start with simple sums that don't require 'carrying'. When we want to add numbers bigger than ten together, we can add the tens and the units separately.

$$\begin{array}{r} 23 \\ +46 \\ \hline 69 \end{array}$$

- 2) If you get stuck, you can use your fingers, or the number grid to help you add numbers together.
- 3) Sometimes, the units will add up to a bigger number than ten. When that happens, we need to 'carry' the ten over into the tens column so it can be added up with the other tens.

$$\begin{array}{r} 26 \\ +46 \\ \hline 72 \\ 1 \end{array}$$

- 4) Once you can add tens up, including carrying, you can use your skills to add hundreds, thousands, any size of number! Have a go with some really big numbers.
- 5) Set some sums for your adult to solve - can you set three which will involve carrying and three which won't?

Extension

To get really good at adding, you need to practise. Try adding up all the ages of people in your household. Then try adding the ages of all the actors in your favourite film, or all the singers in your favourite band. Add the weights of cans of food in your cupboard, or millilitres of toiletries in all the containers in your bathroom. Have a competition where you each think of a sum and see whose has the biggest answer: what's bigger, the weight of all the spreads in your cupboard or the millilitres of milk in your fridge?

Use a Protractor

Equipment:

Protractor,

Ruler,

White board,

White board pen and eraser

- 1) We use protractors to draw angles. First draw a straight line, using your ruler.
- 2) Now position your protractor so that the cross-hairs are on one end of your line.
- 3) Make a small dot next to the edge of your protractor where it says 90° .
- 4) Take away the protractor and use your ruler to join the small dot to the end of the line. You have drawn a 90° angle. 90° angles are also called right angles (if you wanted to go straight up, a 90° angles is just right).
- 5) Find some more space and start again, draw a new straight line, and position your protractor so that the cross-hairs are on one end of your line.
- 6) Make a small dot next to the edge of your protractor where it says 60° . Take the protractor away and use your ruler to join the small dot to the end of the line. You have drawn a 60° angle. Angles less than 90° are called acute angles (anything that fits in such a small space must be a cute thing).
- 7) Finally, draw another line; position your protractor so that the cross-hairs are on one end of your line; make a small dot next to the edge of your protractor where it says 120° ; use your ruler to join the small dot to the end of the line. Angles bigger than 90° are called obtuse (obviously a lot would fit in there).
- 8) If you join together the ends of the shapes that you have drawn, you'll have three triangles. Look at the triangles that you have drawn. If triangles have one small angle, then the other two angles will be bigger. If they have one big angle, then the other angles will be smaller. The total of all the angles is always 180° .
- 9) Rub out your triangles and have another go, choose your own sizes for angles this time, maybe you could make three triangles with one really tiny angle, or three triangles with one really big angle.
- 10) Finally, draw a right angle, then draw another right angle on the end of it, and another right angle on the end of that. Can you draw a quadrilateral (four sided shape) rather than a triangle? How many different sided shapes can you draw using a ruler and a protractor?

Extension

If you have paper and colouring pencils, draw some more triangles and see if you can make them into a picture.

Missing Number Doubles

Equipment:

Squared white board,

White board pen and eraser

- 1) Can you work out what the missing number must be in these sums:

$$4 + a = 10$$

$$b - 7 = 12$$

$$10 + c = 18$$

- 2) Have a go at making up your own missing number sums for your partner to solve.

- 3) Now, can you solve these problems with two missing numbers:

$$d + e = 10 \text{ AND } d \times e = 9$$

$$f \times g = 12 \text{ AND } g - f = 1$$

$$h \times i = 56 \text{ AND } h + i = 15$$

- 4) Have a go at making up your own missing number doubles for your partner to solve.

Extension

You could use some of these sums to make a key, where each letter is represented by a different number. Then use the numbers to write a secret message. Be careful, though, if your sums have two missing numbers, and reversible operations, then you might not be able to work out which letter is which. For example, in the sums above, you can tell which number is g and which is f, but you can't tell which is d and which is e!

Adding Fractions

Equipment:

Squared white board,

White board pen and eraser,

Ruler

- 1) Draw three rectangles on your board, each of them 1 square high and 5 squares long.
- 2) Divide the first rectangle into fifths and colour in one fifth of the rectangle. Underneath that rectangle

write: $\frac{1}{5}$

- 3) Ask your child to do the same to the other two rectangles.
- 4) How many fifths are coloured in altogether?

5) Write: $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$ on the board.

- 6) Now repeat the steps above, but make the rectangles 1 square high and 6 squares long, and write $\frac{1}{6}$ underneath each rectangle.

7) Write: $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6}$ on the board.

- 8) Now draw another rectangle 1 square high and 6 squares long, colour in the first three squares.

How much of the rectangle is coloured in? $\frac{3}{6} = \frac{1}{2}$

- 9) Play this game with different sized rectangles. Try 1x3, 1x4, 1x7 and 1x8. Try colouring in one square on the first rectangle, two squares on the second and three squares on the third - can your child work out the fractions coloured on each rectangle? Can they add the fractions together?

Extension

Bake or buy a rectangular cake and measure the length and width. See if you can cut it into equal sized pieces. Add the fractions together, take them away and eat them.

Weather Machine

Equipment:

Squared white board,

White board pen and eraser

1) Read the story below out loud.

My aunt is an inventor. But, sometimes her inventions are a little bit scary. The Weather Machine is the perfect example. It seemed like fun idea.

"Just think," she said, "it'll never rain on a picnic again. We can have snow every Christmas Day. Who doesn't want to control the weather?"

So, we all agreed to be there and help her to test the Weather Machine. It was a really hot day, at least 25°* and everyone was sweating.

"Phew," my dad said, "it's boiling out there."

"Not quite," my aunt told him, "Water boils at 100°, not 25°. But, don't worry, I can cool us all down. Let's start with ten degrees."

She pressed a few buttons on her machine. "It ought to have gone down by ten degrees, now," she said, "what does that make it?"

25°-10°*

I checked the thermometer on the wall, but it hadn't only gone down by ten degrees, it had gone down by twenty! It read 25°-20°*, and everyone was starting to shiver.

"Oops," my aunt said, "I haven't quite got the calibration right. I'll just put it up by ten degrees."

She pressed more buttons, but she must have pressed the wrong ones, because the temperature didn't go up by ten degrees, it went down again! It went past zero to 5°-10°*

Now the water in the bird bath was frozen solid and my dad's lips were starting to go blue.

"Turn it up," my dad shouted, through his shivers, "t-t-t-turn it up!"

"Alright," said my aunt, "don't panic."

She pressed more buttons, but nothing happened. The temperature seemed to be stuck at -5°.

"Oh, dear," my aunt said, "it seems to have frozen the controls. I suppose it was a little silly to use hydraulics in a Weather Machine."

I didn't know how long it would take my aunt to fix it, but I knew we couldn't stand in the cold, wearing our summer clothes for much longer. So, I ran to the wall and pulled out the plug. The Weather Machine clicked off right away, and the weather returned to normal.

"Don't worry," my aunt said, "I'll have a bit of a tinker with it, and we can try again next weekend!"

2) Draw four thermometers on the white board, ranging from -10 to +30 degrees celsius.

3) Read the story again, but stop at every star and draw the temperature that the thermometer is showing.

Extension

Read the weather forecasts for a week and plot the predicted temperature on a line graph. Then take the actual temperature everyday and plot the actual temperatures on the same graph. How close was the forecast?

Nine Times Table

Equipment:

Squared white board,

White board pen and eraser,

Number grid,

Counters.

- 1) The nine times table is a special one. Use the white board to write down the all the numbers in the nine times table, up to ten times nine, following the pattern below. (If you need help working out the nine times table, use the number grid. Put one counter on nine, count on nine, and put a counter on eighteen - that's two times nine. Keep counting on 9, until you reach ninety - there are ten counters on the grid now, so ninety is ten times nine.)

0 9

1 8

2 7

- 2) Add together the two digits of each number, following the pattern below:

$$0+9=9$$

$$1+8=9$$

$$2+7=9$$

- 3) What do you notice? The sums of the digits of all numbers in the nine times table add up to nine.
- 4) You might also notice, if you look at the two columns of numbers that the left digits read '0,1,2,3,4,5,6,7,8,9' and the right digits read '9,8,7,6,5,4,3,2,1'.
- 5) There's another trick we can do with the nine times table. If you put your hands flat in front of you, with all the fingers out except the first one, you will have nine fingers up and $1 \times 9 = 9$.
- 6) Now put down only the second finger. You'll have one finger up on the left hand side and eight up on the right hand side. One ten and eight units makes 18; $2 \times 9 = 18$. This works for all the nine times table up to 9×10 .

Extension

If you have a calculator you can try multiplying nine by some really big numbers. You may need to add together the digits of your answer, you will get to nine eventually, e.g. $43 \times 9 = 387$; $3+8+7=18$; $1+8=9$.

Jeopardy Maths

Equipment:
Counters,
Number grid

- 1) Take it in turns to say a number, the other player should say a sum that would give that answer. For example, if the first player says '100', the second player might say '10 times 10' or '70 add 30' or '240 take away 140'. There are infinitely many right answers (but be careful, there are infinitely many wrong answers too)! If you're stuck, use the number grid and counters to help.
- 2) Once you've got the hang of the game, try making it a bit trickier. The sum must be a multiplication or a division sum, and no ones or zeros are allowed!
- 3) Once you're good at this, add a new rule: all sums must contain at least two operations. For example, answers to '100' would now include 2×5 , then $+90$; 55×2 , then -10 . You should say 'then' between your operations to make it clear that they are two sums (see extension, if you want to know more).

Extension

When you use two operations it's very important to get the order right! We don't always do sums in the order they are written. Sums have their own special order, I remember it like this: BODMAS (Brackets, Orders, Division, Multiplication, Addition, Subtraction). In the sums above, we do the multiplication first, before the addition. If you want to do the addition first, you need to put brackets around it, e.g. $2 \times (5 + 90) = 190$ but $2 \times 5 + 90 = 100$. The easiest way to say this aloud is: five plus ninety, all multiplied by 2 (the 'all' tells us that the previous sum was in brackets). Have a go at playing maths jeopardy on paper, writing brackets where you need them to make sure your sums are always done in the right order.

If you're up for a challenge, you can try the four 4's challenge. All the numbers from 0 to 100 can be made

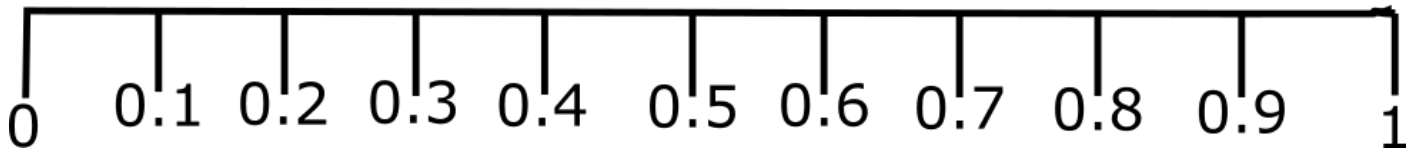
from sums with four 4's and a wide variety of operations. For example, $\frac{4}{4} - \frac{4}{4} = 0$; $\frac{4}{4} \times \frac{4}{4} = 1$

See how many of the numbers from 0 to 100 you can make.

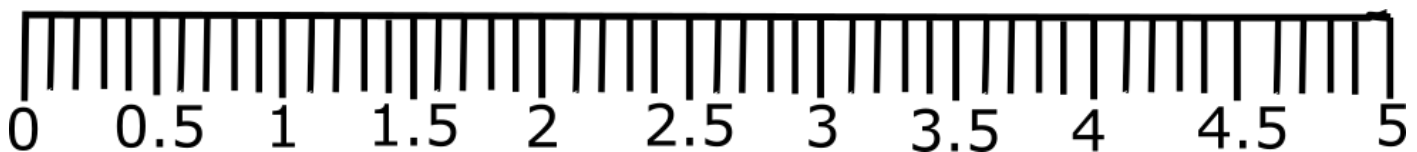
Decimals

Equipment:
Counters,
Ruler

- 1) Can you remember how to multiply by ten? You move the digits one place to the left, filling in the gap in the units column with 0. Can you multiply these numbers by ten: 4, 8, 65, 290?
- 2) Can you remember how to divide by ten? You move the digits one place to the right, getting rid of the spare 0 from the units column. Can you divide these numbers by ten: 290; 50; 7500; 430?
- 3) What do you do if there isn't a zero in the units column when you're dividing by ten, for example $876 \div 10$? You move that number into the tenths column.
- 4) Can you see a dot between the units column and the tenths column? The tenths column is for numbers that are between 0 and 1. We must always put a decimal point, so that everyone can see the numbers are smaller than units. $0.1 = \frac{1}{10}$
- 5) Can you divide these numbers by ten: 45; 63; 127?
- 6) If you want to divide a number that already has a decimal place by ten, you can move everything one to the right so that there are now two numbers after the decimal place; e.g. $4.5 \div 10 = 0.45$
Have a go at dividing these numbers by ten: 34.2; 67.1; 90.5
- 7) We can add and take away tenths, just like we can add and take away ones or any other number. Put your counter on the number 1 on the numberline below. To add 0.1, move your counter a small line to the right. It should now be on 0.1. To add 0.2, move your counter two small lines to the right. It should now be on 0.3, because $0.1+0.2=0.3$



- 8) Use the numberline below to try and solve these addition problems: $4 + 0.5$; $1.5 + 3$; $0 + 0.7$



- 9) Now use the numberline to try and solve these subtraction problems: $5 - 0.2$; $4.8 - 0.3$; $0.7 - 0.1$
- 10) Look at your ruler. Between the 0 and the 1, there are ten little lines, these are tenths of a centimetre. If you have a ruler, you always have a numberline with decimals on it. Have a go at solving these sums using your ruler as a numberline (it can help to use the point at the end of a pencil as a counter, because the lines are very small).

Extension

Look back at the page on the Ten Times Table, make a new place value book, but this time, cut your paper into five flaps (for Hundreds, Tens, Units, Tenths, and Hundredths) and label them: 'H', 'T', 'U', 'Tth', 'Hth'.

Percentages

Equipment:
Number grid,
Counters

- 1) A percentage is just a fraction with a fun name: percentage means out of 100. If you lay fifty counters out on your number grid, covering the numbers 1-50, you'll have covered 50% of the grid.
- 2) Can you lay out counters to cover 30% of the grid? How about 75%, or 15%?
- 3) If you want to take away a percentage from the whole grid, just start at the other end. For example, to take away 10%, lay out ten counters, starting at 100, and going backwards to 91.
- 4) The biggest number left uncovered (in this case 90) is the answer $100\% - 10\% = 90\%$
- 5) Can you do these sums: $100\% - 45\%$; $100\% - 15\%$; $100\% - 25\%$?
- 6) If you want to find a percentage of another number, it's the same as finding any fraction of that number. First divide by the bottom of the fraction (with a percentage, the bottom number is always 100), then multiply by the top number. So, $20\% \text{ of } 300 = 300 \div 100 \times 20$
 $= 3 \times 20$
 $= 60$
- 7) Can you find these percentages of these numbers: 10% of 500; 30% of 200; 15% of 400?
- 8) Sometimes, when you divide by 100, you get a decimal, you can still find a percentage. For example: $20\% \text{ of } 450 = 450 \div 100 \times 20$
 $= 4.5 \times 20$
 $= 90$
- 9) Can you find these percentages of these numbers: 10% of 630; 20% of 450; 40% of 220?

Extension

Shops sometimes have sales where they promise a certain percentage off a price. If you can find one of these sales - either in store or online - you can work out the new prices together.

Have a look in your cupboards and see if you can find anything with '20% extra' or '10% less sugar'. See if you can work out how much extra you've got, or how much sugar has been taken out.

Animal Pool

Equipment:

Counters,

Wooden animals,

Squared white board,

White board pen and eraser,

Ruler

- 1) Do you remember the animal walk we did before? Let's imagine that the animal is walking around a pool of water. Use your counters to lay out the shape of a rectangular pool, and choose an animal to walk around it.
- 2) How big is the area of the pool? You can count your counters to find out.
- 3) A pool should have a depth as well as an area. Lay another counter on top of each of the counters that make your pool. How many counters are there now? It's the area of the pool multiplied by two.
- 4) Lay down two more counters on top of each of your pool counters, so your entire pool is now four counters deep. How many counters does your pool have now? It should be the area multiplied by four.
- 5) Try making some pools with different areas. See if you can work out the volume of the pool before you count the counters to see if you were right.
- 6) Draw a triangular pool on your white board. You can work out the area by multiplying the base (the length of the side at the bottom) by the height (the distance between the top vertex and the base) and then multiplying your result by half.
- 7) If your pool is two deep, what is the area of your triangular pool?

Extension

If you have a measuring jug, you can work out the capacity of cups, mugs and bowls in your house by filling them with water, then pouring the water into the measuring jug. The volume of water is equal to the capacity of the container.

If you have digital scales in your kitchen, you can weigh the water instead. One ml of water weighs one gram.

Tardigrade House

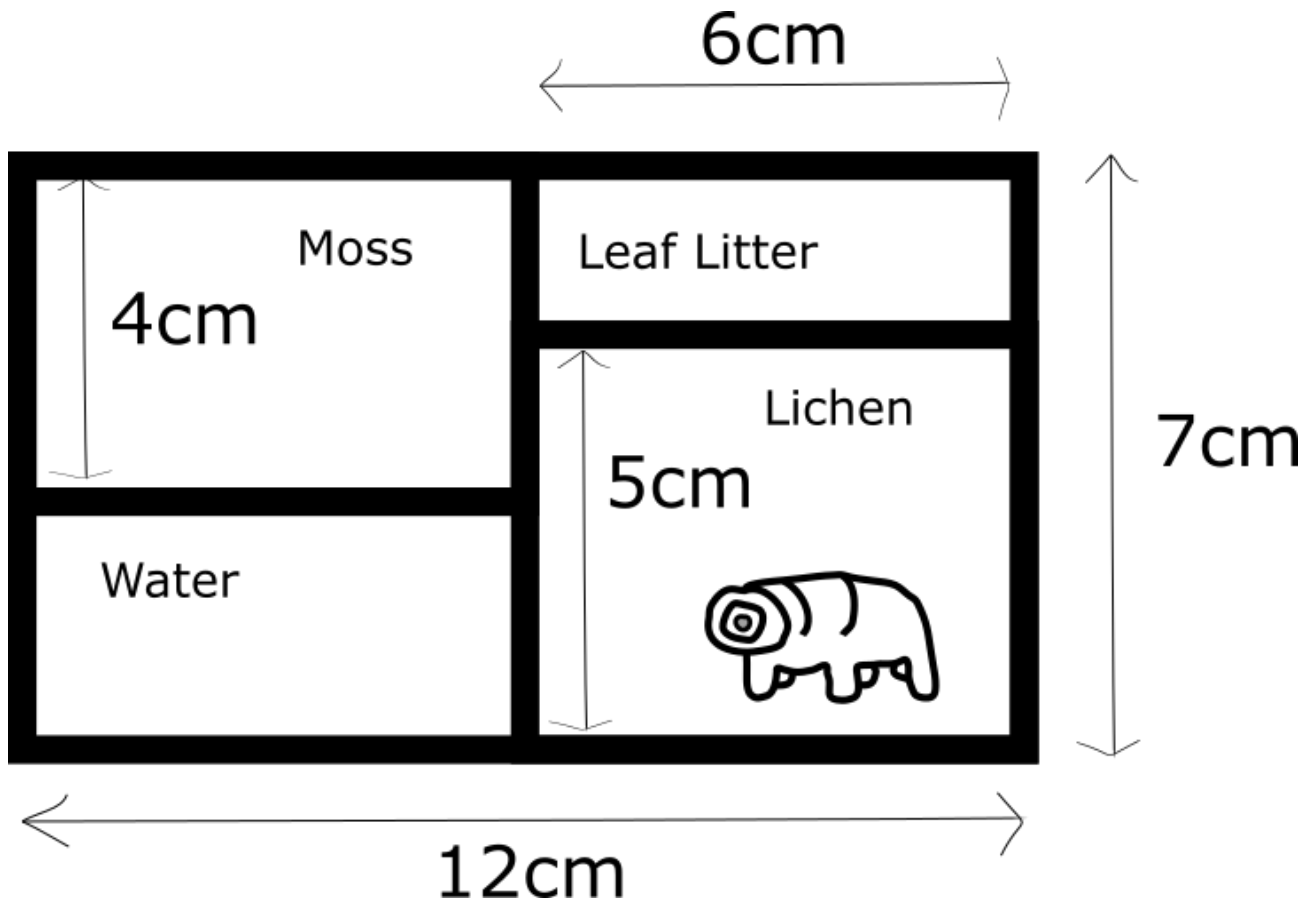
Equipment:

Squared white board,

White board pen and eraser,

Ruler

- 1) Tardigrades are tiny, so the biggest measurement that they understand is millimetres. I am planning to dig a pond which I think would make a lovely home for tardigrades. Can you convert the measurements from centimetres to millimetres so that they will understand the diagram? There are ten millimetres in one centimetre.



- 2) My neighbours are giants, and they don't understand any measurements smaller than kilometres. Can you convert my pond measurements into kilometres so they know how big a pond I plan on digging?
- 3) Draw your own plan on the board, using a ruler to measure it in centimetres. Then convert the measurements for the sake of the tardigrades and the giants.

Extension

If you have a garden, maybe you could make a pond to go in it. Put a bowl of water, with some rocks in and around it, to help animals in and out, and see how many creatures turn up to fill the new development.

Multiplying and Dividing Fractions

Equipment:

Counters,

Squared white board,

White board pen and eraser

- 1) Use the counters to make two squares, each with sixteen counters (4 long and 4 wide).
- 2) Divide one square into quarters: four little squares each containing four counters.
- 3) Divide the other square in half, by gently pushing the counters apart into two columns.
- 4) Now divide each of those columns in half, and count how many counters are in the resulting columns.
- 5) There are four counters in each column, just like there are four counters in each of the quarters of the first square. This is because half of a half is a quarter. We write it like this:

$$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

- 6) What happens if you half the quarters? What fraction do you have now? (If you're not sure what fraction of the whole square your new group is, count how many of these groups there are in the whole square. There are eight of these groups in one whole, so they must be $\frac{1}{8}$)

$$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$$

- 7) What about, if you half the eighths? Then you get sixteenths. Can you see the pattern in the written sums? To multiply fractions together, you multiply the top numbers by one another and the bottom numbers by one another. Can you try this one: $\frac{2}{3} \times \frac{1}{4}$?

- 8) Get twelve counters and lay them out in three columns of four. Now separate out two of the three columns and put them on the right hand side. Half the right hand side counters, how many is that?

You should notice that you have two of your twelve counters, that is to say $\frac{2}{12}$ of your counters (hopefully what you got when you tried multiplying the fractions).

- 9) Have a go at multiplying these pairs of fractions: $\frac{1}{4} \times \frac{1}{10}$; $\frac{2}{6} \times \frac{3}{5}$; $\frac{1}{8} \times \frac{4}{6}$.

Extension

If your child is ready, you can move on to dividing fractions. First lay out a four by four square again and divide it into quarters. How many quarters are there in a half? Dividing is just the same as saying 'how many are there'.

Dividing by a number is the same as multiplying by a fraction. Dividing by 2 will give you the same result as multiplying by a half.

So, when we want to divide one fraction by another, we turn the second fraction upside down and times the

fractions together: $\frac{1}{2} \div \frac{1}{4} = \frac{1}{2} \times \frac{4}{1} = \frac{4}{2} = 2$

Frog Bookshop

Equipment:

Frogs from the balance kit,
Squared white board,
White board pen and eraser

- 1) We're setting up a pretend book shop for the frogs. Choose four frogs to be customers.
- 2) Here's the money that the frogs have, add up the coins to work out how much each frog can spend:

Frog	Coins	Total
1	5p, 10p, 10p, £1, £2	
2	20p, 50p, 50p, £1, £2	
3	1p, 2p, 50p, £2	
4	20p, 20p, 20p, 20p, 50p, 50p	

- 3) Here are some books which would interest frogs, which books can each of the four frogs afford?

Book	Price
How to Hop Really High	£1.80
Once Upon a Pond	£2.50
Lilypads Forever	£3.20
Top Ten Frog Singers	£3.99

- 4) Choose four more frogs. These frogs each have a twenty pound note, and they buy one book each, and they each buy a different book, how much change do they get?
- 5) One more frog arrives, also with a twenty pound note. This frog buys one copy of each of the books. How much change does this frog get?

Extension

If possible, visit a real shop and spend some money together. Can you work out how much change you'll get? If you do your grocery shopping online, let your child help do a shop, and try to get everything you need without going over budget.

Roman Numerals

Extension:

Time snail,

Squared whiteboard,

Whiteboard pen and eraser

1. Look at the antenna of your time snail. There are two clocks on the end. One clock has the numbers that we usually use (Arabic Numerals) the other has the same numbers written in. Roman Numerals. Can you work out what the Roman Numerals represent by matching the clocks together? Which Roman Numeral represents twelve?
2. If you look closely, you might be able to see a bit of a pattern to the Roman Numerals. The first four are like tally marks I; II; III. But, the fourth is different, it's IV - one before V, which is five. Then the sixth is one after V: VI. When it gets to nine, it's written as IX - one before X, which is ten. Can you guess what thirteen would be?
3. Can you guess fifteen?
4. When you get to twenty, you start the next pattern; twenty is XX. Can you guess what twenty one is?
5. There are a few more special marks: L is fifty, C is one hundred, D is five hundred, M is one thousand. What number do you think this is: MDCLXVI?
6. Have a go at writing the year you were born in Roman Numerals.

Extension

If you have some clay or playdough, try to scratch the numbers one to ten in Arabic Numerals and in Roman Numerals with a skewer or the end of a paintbrush. Which one is easier to scratch?

If you watch a film on TV, you may see the Copyright year written in Roman Numerals. See if you can spot it, and work out what year it is!

Answers: In case you get very stuck, 12= XII; 13=XIII; 15=XV; 21=XXI; 1666=MDCLXVI.

Times Table Board Game

Equipment:

Counters,

Number grid,

Foam die,

White board,

White board pen and eraser

- 1) First step, make the rules! Write this table on the white board, then fill in the gaps:

Times Table	Action
2	
5	
10	

Some actions to give you ideas: clap your hands, stand up and sit down, stick out your tongue, say 'hooray', have a sip of your drink, touch your toes.

- 2) Take it in turns to roll the die, move your counter, then follow the instructions on the board. If you forget to follow the instructions, or forget which times table(s) contain(s) the number you landed on, you move back one square (you don't have to follow the instructions for that number). See who gets to 100 first (don't forget that 100 is in the 2, the 5 and the 10 times table!).
- 3) If you're good at this version of the game, add another row to your table and add another rule, what will you do when you land on the four times table, the three times table, the eleven times table, the twelve times table?

Extension

Try taking the game outside and use more energetic actions like star jumps, running to the end of the garden and back, throwing a ball to your partner etc.

Faces

Equipment:

Geometric shapes,

Squared white board,

White board pen and eraser,

Ruler

- 1) Look at your shapes. How many have square faces? How many have rectangular faces that aren't squares? How many have circular faces? How many have triangular faces?
- 2) Make a table to show this.
- 3) Then, using the squared white board, draw a bar chart to show your results.

Extension

If you have some paint, or an ink pad, dip your shapes in the paint and make impressions on a piece of paper. Can you make a pattern? Can you make a picture?

Biscuit Recipe

Equipment:

Squared white board,

White board pen and eraser

- 1) Read the recipe below:

Ingredients

200 g butter

200 g caster sugar

2 eggs

400 g plain flour

Method

- Cream the butter and sugar together.
- Mix in the eggs.
- Stir in the flour.
- Tip the dough onto a floured surface.
- Roll the dough until it is half a centimetre thick.
- Use a biscuit cutter to cut out the biscuits.
- Put the biscuits on a greased baking tray.
- Bake in the oven at gas mark 5 (190°C) for twenty minutes.

- 2) This recipe makes twenty biscuits. How much of all the ingredients would you need to make forty biscuits?
- 3) How much of all the ingredients would you need to make ten biscuits?
- 4) If you were using three eggs, how many biscuits would you be making? How much of all the other ingredients would you need?

Extension

If you can, make the biscuits.

If you have a recipe book, find some of your favourite recipes and work out how to double them to feed lots of people, and how to half them to feed a small number of people.

Plot the Shape

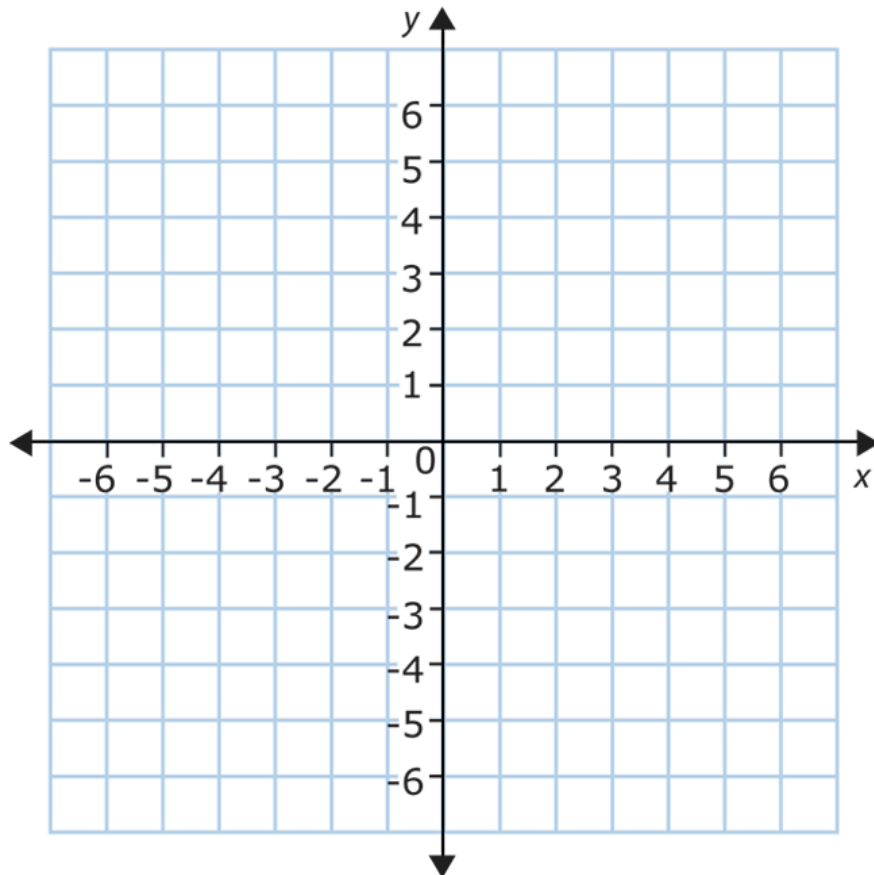
Equipment:

Ruler,

Squared white board,

White board pen and eraser

- 1) Copy these axes onto your white board, using a ruler to draw the straight lines.



-
- 2) Find the point (4, 3) and draw an x.
 - 3) Draw another x at (4, 4).
 - 4) Then two more at (2, 2) and (2, 4).
 - 5) Join all the x's together with straight lines. What shape have you drawn?
 - 6) Now try plotting these points: (-1, -5), (-3, -1), (-5, -5). Join them together. What shape have you drawn this time?
 - 7) Draw your own shape on the grid. Make a note of the co-ordinates of all the vertices of your shape. Now rub your shape off the board.
 - 8) Give your partner your list of co-ordinates and see if they can draw the shape that you drew.
 - 9) Try to work out the co-ordinates of a letter for your partner to draw.

Extension

If you have access to a computer or smart phone, you can have a go programming a turtle called Logo to draw shapes. There are various apps and websites that let you try out programming Logo.

Dividing Small Numbers

Equipment:

Squared white board,

White board pen and eraser

- 1) Sometimes you will want to divide small numbers - numbers less than one. When you do that, you use the same process as you use to divide big numbers, but you put a decimal place in your number, and you might need some more zeros after the decimal place. Can you remember how to divide 3 by 10?
- 2) Can you do $3 \div 1000$?
- 3) Let's look at how to divide 3 by 8. First, copy the sum onto the whiteboard:

$$\begin{array}{r} 8 \overline{) 3.000} \end{array}$$

- 4) First, we ask how many 8's are there in 3? Obviously, the answer must be 0, since three is smaller than 8. So, we write 0 over the 3, then we carry the 3 over and put it in front of the first 0.

$$\begin{array}{r} 0. \\ 8 \overline{) 3^3.000} \end{array}$$

- 5) We make sure that we copy the decimal place and put it precisely over the one on the bottom line.
- 6) Now we ask how many 8's are there in 30? Well, the closest multiple of 8 - without going over - is 24, which is 3 times 8. So, we write 3 over the 30. But, 24 is 6 less than 30, so we carry the 6 down, and put it in front of the next 0.

$$\begin{array}{r} 0.3 \\ 8 \overline{) 3^3.0^600} \end{array}$$

- 7) Now we ask how many 8's are there in 60? Well, the closest multiple of 8 - without going over - is 56, which is 7 times 8. So we write 7 over the 60. But, 56 is 4 less than 60, so we carry the 4 down and put it over the next 0.

$$\begin{array}{r} 0.37 \\ 8 \overline{) 3^3.0^640} \end{array}$$

- 8) Now we ask how many 8's are there in 40? The answer is 5. So we write 5 over the 40. Since $5 \times 8 = 40$ with no remainders, we are finished!

$$\begin{array}{r} 0.375 \\ 8 \overline{) 3^3.0^64^50} \end{array}$$

- 9) Have a go at these division sums yourself: $12.5 \div 5$; $32.2 \div 2$; $1 \div 4$; $2 \div 5$.
- 10) Make sure that you are careful to put your decimal place where it belongs!

Extension

Be careful if you choose some numbers of your own to practise dividing small numbers. There are some decimals that never end, we call these recurring decimals, if you start $1 \div 3$, you will have to stop at some point! $2 \div 7$ is a recurring decimal too. Can you find any more?

Subtracting Big Numbers

Equipment

Geometry shapes

Number grid

Whiteboard

White board pen and eraser

- 1) Make a rocket using the geometry shapes. Count down from ten and launch your rocket into space (pick it up and make explosive noises). Try counting down from other numbers too.
- 2) Subtraction is counting down. We lay out subtraction sums in a very similar way to addition sums. Start with some sums that don't require any 'borrowing'.

$$46$$
$$\underline{-23}$$
$$23$$

- 3) Sometimes there aren't enough units, and we have to 'borrow' from the tens column.

$$43$$
$$\underline{-26}$$
$$\text{—}$$

First we take one away from the number in the tens column.

343
$$\underline{-26}$$
$$\text{—}$$

Then we add ten to the number in the units column.

$$^3\cancel{4}^{13}$$
$$\underline{-26}$$
$$\text{—}$$

Then we can complete the subtraction sum.

$$^3\cancel{4}^{13}$$
$$\underline{-26}$$
$$17$$

- 4) Once you've mastered subtracting tens and units, you can use your skills to subtract hundreds, thousands, any size of number!
- 5) Have a go at setting subtraction sums for one another to solve. Try to set some which involve borrowing and some which don't.
- 6) Mix up addition and subtraction sums - remember to check the sign so you know which sum you should be doing!

Extension

Counting down is really important to subtracting. Make a rocket big enough to sit in - you could use a big cardboard box, a laundry basket, or some artfully arranged cushions - count down to your launch. Where will you go? Perhaps you could explore a new planet. Don't forget to fly home again in time for bed.

How Many Days

Equipment

Calendar

Squared white board

White board pen and eraser

- 1) Set the wooden calendar to today's date.
- 2) How many days is it until your birthday?
- 3) How many days is it since your last birthday?
- 4) Work out how many days it is until: New Year's Day (January 1st),
Valentine's Day (February 14th),
Shakespeare's Birthday (April 23rd),
Bonfire Night (November 5th),
Christmas (December 25th).

In case you need help remembering the order of the months, or how many days there are in each month:

Month	Number of Days
January	31
February	28 (29 in leap years 2024, 2028, 2032, 2036 etc.)
March	31
April	30
May	31
June	30
July	31
August	31
September	30
October	31
November	30
December	31

Extension

Make a countdown calendar to an important day. Take two pieces of card. Carefully cut out 'doors' in one piece of card - one door for each day. Then stick that card (careful to only stick the edges, not behind any of the doors) on top of the other piece of card. Draw a picture behind each door. As you await the special day, you can open a door on your countdown calendar each day.

Animal Picnic Three

Equipment:

Wooden animals,
Squared whiteboard,
Whiteboard pen and eraser.

- 1) Take out the wooden animals. Choose three of different sizes.
- 2) Draw a cake eight squares big on the whiteboard.
- 3) Since the animals are different sizes, they've decided to try and split the cake so that the biggest of them gets the biggest slice. So, the biggest one is going to have $\frac{3}{8}$ the next biggest is going to have $\frac{2}{8}$ and the smallest is going to have $\frac{1}{8}$. They haven't quite got it right, though, how many eighths is that altogether? How many eighths will be left over?
- 4) Can you think of a way of splitting the cake into eight pieces and sharing them among the three animals so that the biggest animal gets the most, the middle animal gets a middling amount, and the smallest animal gets the least? How many eighths would each animal get?
- 5) Draw a cake with ten squares. Can you think of a way of splitting the cake into ten pieces and sharing them among the three animals so that the biggest animal gets the most, the middle animal gets a middling amount, and the smallest animal gets the least? How many tenths would each animal get?

Extension

Add up all the ages in your house, then write your own age as a fraction of the total age, like this:

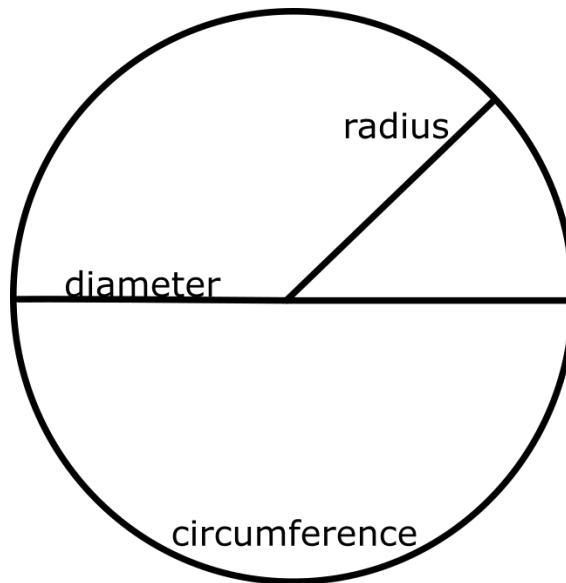
$$\frac{\text{your age}}{\text{total age of everyone in the house}}$$
now write everyone else's age as a fraction of the total age.

Finally, add all the fractions together, you should get
$$\frac{\text{the total age of everyone in the house}}{\text{the total age of everyone in the house}}$$

Circles

Equipment:
White board,
White board pen and eraser

- 1) Have a look at the circle below and read out all the parts:



- 2) Your child should draw this picture on the white board, while you read out the description:

Draw a big circle in the middle of the board.

Draw two smaller circles above the big circle.

Draw in the diameter of each of the small circles - try to make it a horizontal line.

Underneath your first circle, draw the bottom half of the circumference of an even bigger circle.

At the very top of the board, draw a medium sized circle.

Draw six radius lines inside this circle.

Draw a triangle underneath this circle, with it's top vertex touching the bottom of the circumference of the circle.

Hopefully, you'll have drawn a sleepy clown!

- 3) Take it in turns to dictate a drawing - try to include all the circle vocabulary words - while your partner draws it.

Extension

If you have some paper, scissors and pencils wrap a piece of paper around a circle - the top of a cup or vase would be perfect - and cut it so that you have a strip of paper the length of the circle's circumference. Now carefully - you should use a ruler to divide it accurately - cut your circumference into three equal lengths.

Lay these lengths across the middle of your circle. They will be almost exactly the diameter.

It doesn't matter what size circle you use, this will always work.

The circumference of any circle divided by its diameter is a special number called pi π

The exact value of pi is still unknown¹, but it's roughly 3.

¹ Pi has been calculated to 2,577 billion places, calculators will usually give you at least ten, but most people never remember beyond 3.14. Three is accurate enough for all rough calculations.

Multiplying Big Numbers

Equipment:

Counters,

Squared white board,

White board pen and eraser

- 1) Make ten piles of four counters - count how many counters you have altogether.
- 2) Now make another four piles of four counters - count how many counters you have altogether.
- 3) Add your four piles to your ten piles. How many counters do you have now?

$$4 \times 10 = 40; 4 \times 4 = 16; 40 + 16 = 56.$$

$$4 \times 14 = 56$$

If you multiply a number by two numbers, and then add those two answers together, the result will be the same as if you added the two numbers together first and then multiplied your answer by that first number.

- 4) If we want to multiply by a number bigger than ten, we multiply by the tens, then by the units, and add the two answers together. First we lay the sum out like this:

$$\begin{array}{r} 56 \\ \times 12 \\ \hline \end{array}$$

- 5) Then we multiply the top number by the tens digit of the bottom number:

$$\begin{array}{r} 56 \\ \times 12 \\ \hline 560 \end{array}$$

- 6) Then we multiply the top number by the units digit of the bottom number:

$$\begin{array}{r} 56 \\ \times 12 \\ \hline 560 \\ + 112 \\ \hline \end{array}$$

- 7) Then we add those two answers together:

$$\begin{array}{r} 56 \\ \times 12 \\ \hline 560 \\ + 112 \\ \hline 672 \end{array}$$

- 8) Have a go at laying out these sums on the white board: 23×15 ; 52×13 ; 27×12 .

- 9) Try and do the sums that you have laid out.

- 10) If you're happy with these, have a go at a multiplication with a bigger digit in the tens column. Try 23×21 ; 25×35 ; 72×32 . You solve them like the one below:

$$\begin{array}{r} 56 \\ \times 21 \\ \hline 1120 \\ + 56 \\ \hline 1176 \end{array}$$

Extension

If your child is confident multiplying two digit numbers, you could try moving on to three digit numbers.

Factor Ladders

Equipment:

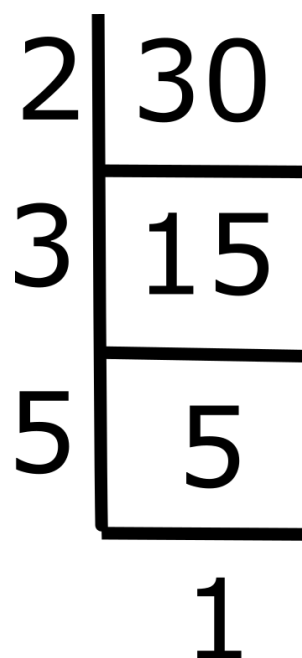
Counters,

Number grid,

Squared white board,

White board pen and eraser

- 1) Get out the grid and lay a counter on the number 36.
- 2) Now count out 36 counters. Can you sort them into nine groups? How many counters are in each group?
- 3) Can you sort the counters into twelve groups? How many counters are in each group?
- 4) Can you find any other numbers that 36 divides by? How many different arrangements can you make, ensuring that there are always the same number of counters in each group?
- 5) Thirty six divides by: 18, 12, 9, 6, 4, 3 and 2. We call these the factors of 36.
- 6) Can you find the factors of 12 using the counters? Try dividing 12 into 2 groups, and see if they're equal; then 3 groups, then 4 groups, then 5 groups and so on, until you've tried all the possibilities. Make a note on the white board of which numbers you could divide 12 into. Those are the factors of 12.
- 7) There's an orderly way of working out all the factors of a number, so you don't have to keep sorting them into groups. First write the number you want to sort at the top of your white board, with a ladder, shape under it.
- 8) We work up from the smallest number (not counting 1). Does our number divide by 2? If it does, write '2' to one side. Then divide by 2 and write your answer underneath.
- 9) Now we start again, does it divide by 2? If it doesn't, we ask, does it divide by 3? If it does, then, write '3' to one side, divide by 3 and write the answer underneath.
- 10) Now we start again, does it divide by 2? If it doesn't, we ask, does it divide by 3? If it doesn't, then we ask, does it divide by 5? If it does, then, write '5' to one side, divide by 5 and write the answer underneath.
- 11) When you get to 1 on the bottom, you've got all your prime factors in a line on the side. We only put prime numbers on the side, so you go through your 'does it divide by' numbers like this: 2, 3, 5, 7, 11, 13 etc. If you want to write a number as a product of its prime factors, you just have to write multiply between all the numbers on the side, e.g. $2 \times 3 \times 5 = 30$
- 12) Can you find all the prime factors of 100?
- 13) You can find all the other factors by multiplying the prime factors together. So, the prime factors of 30 are: 2, 3 and 5. The other factors are $2 \times 3 = 6$, $2 \times 5 = 10$ and $3 \times 5 = 15$. What are the other factors of 100 (because 2 and 5 both feature twice as prime factors, you can multiply them twice too e.g. $2 \times 2 \times 5 = 20$ is a factor of 100, as is $2 \times 5 \times 5 = 50$)?
- 14) Have a go at finding the factors of these numbers: 6, 8, 45, 48, 69, 35.
- 15) If you have the factors of a pair of numbers, you can try to find the highest common factor - that is the biggest number that is a factor of both numbers. The highest common factor of 36 and 24 is 12, for example. Can you find the highest common factor of 100 and 48; 69 and 35; 8 and 6?



Extension

If you have a recipe book, have a look at some recipes and find the highest common factor of the sugar and flour.

Dividing Big Numbers

Equipment:

Counters,

Squared white board,

White board pen and eraser

- 1) Count 66 counters out onto the table.
- 2) Put the counters in piles of three. How many piles do you have? There are 22 threes in 66.
- 3) Now sort your piles of three counters into three groups: two groups of ten and one group of two. There are $10+10+2=22$ piles of three counters. There are still 66 counters altogether.
- 4) When we want to divide a big number, we can divide the tens first, and then the units, and add our answers together. First, we lay out the division sum like this:

$$\begin{array}{r} 4 \overline{) 84} \end{array}$$

- 5) Then we work out how many of the small number are in the tens place of the bigger number:

$$\begin{array}{r} 2 \\ 4 \overline{) 84} \end{array}$$

- 6) Then we work out how many of the small number are in the units place of the bigger

$$\begin{array}{r} 21 \\ 4 \overline{) 84} \end{array}$$

number:

- 7) Now we have our answer $84 \div 4 = 21$
- 8) Can you use this technique to work out 84 divided by 2?
- 9) Can you solve 96 divided by 3? How about 66 divided by three?
- 10) Can you solve 484 divided by 4?
- 11) Can you divide 484 by 2?

Extension

Play a times table memory game. Make small cards with sums on half and answers on the other half. The seven times table would have: 7×1 ; 7×2 ; 7×3 ; 7×4 ; 7×5 ; 7×6 ; 7×7 ; 7×8 ; 7×9 ; 7×10 ; 7; 14; 21; 28; 35; 42; 49; 56; 63; 70.

Lay all the cards face down and shuffle them. Take it in turns to turn over two cards. If you have a matching sum and answer, you keep the cards. If the cards don't match, turn them back face down again. Keep playing until all the cards have been collected.

Noun Hunt

Equipment:

This book,

Squared white board,

White board pen and eraser

- 1) Choose any four pages in this book and count how many nouns are on each page.
- 2) We're going to work out the average number of nouns. The average² number is how many there would be on each page if the total number was shared equally among the pages. To get it with add together how many nouns you found in total and divide it by how many pages you counted. What is the average number of nouns on those four pages?
- 3) Choose a fifth page and count how many nouns are on that page. Is it higher or lower than average?
- 4) Can you find a page with the average number of nouns on it?
- 5) Do you think that there is such a thing as an average page of this book? Is there such a thing as an average person?

Extension

If you look at the page on mad libs, you will find different parts of speech. You could do a hunt for these and find the average number of times they appear in this book.

You could also do a noun hunt in a different book. Which has a higher average number of nouns: recipe books or picture books?

² There are three kinds of average, we are looking at the mean average. The mode (which is the number that comes up most often) and the median (which is the middle number if you write all the numbers in size order) aren't part of the primary curriculum.

Frog Bakery

Equipment:

Frogs from balance kit,
White board,
White board pen and eraser

- 1) Draw some cakes and loaves of bread on the white board. It's a bakery for frogs, so you might want to add some flies or worms to appeal to your customers.
- 2) Write a price next to each of your baked goods, somewhere between 50p and £2.00.
- 3) Take it in turns to make one of the frogs visit the frog bakery and buy a cake. Your frogs should start with a reasonable budget, maybe £5.00 each. What will they choose? How much change do they get?
- 4) When you've played for a while, it's time for your bakery to have a half price sale! Work out the new prices and write them on the board. If necessary round up to whole numbers of pennies - nobody can pay half a penny!
- 5) Take it in turns to bring in the frog customers again, what do they buy this time? How much change do they get?
- 6) For an extra challenge, add on VAT to any chocolate covered biscuits in your bakery. The quick way of calculating VAT at 17.5% is to work out 10%, then half it for 5%, then half it again for 2.5%, add them all together $10+5+2.5=17.5$

Extension

You could bake some biscuits and set up your own bakery at home. You could make play money out of paper to make the game more realistic.

Offer repeat customers a 25% discount on their second purchase.

Scale Drawings

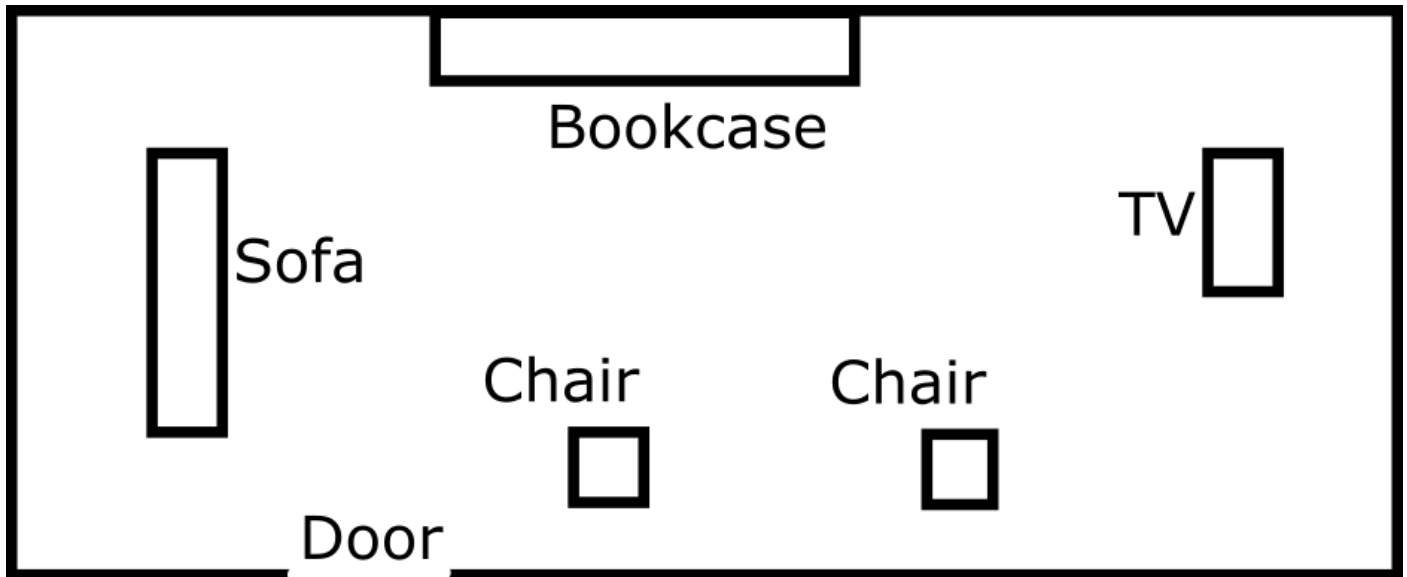
Equipment:

Ruler,

Squared white board,

White board pen and eraser

- 1) Look at the scale drawing of my living room below. My real sofa is 2m long, so in the scale drawing, I drew it 4cm long. Measure it with the ruler and see if the printer has kept the sizes right.



Scale

$1\text{cm} = 0.5\text{m}$

- 2) My real TV table is 1m wide, how long should I have drawn it in the picture? Measure and see if it's right.
- 3) The scale factor of my drawing is 1:10 because everything in the drawing is ten times smaller than it is in real life.
- 4) I want to write a version of this book for the tiny wooden animals. Can you help me make a scale drawing the right size? I am going to make the book half as big this book, a scale of 1:2. Can you draw my living room half as big on your whiteboard? (You could take a photo and email it to me so I can put it in the book for the animals.)

Extension

If you have a tape measure, measure the furniture in one of your rooms at home and draw a scale drawing of it.

Multiplying Small Numbers

Equipment:

Squared white board,

White board pen and eraser

- 1) When multiplying small numbers with a decimal point, the important thing is to line up your digits correctly. Can you copy this sum onto your white board, making sure that all the digits are lined up?

	0.	1	2	5
x				7

- 2) We always work from right to left when doing sums, starting with the units, just in case we need to carry. So, for this sum, we start with 5×7 , which is 35. We carry the 3.

	0.	1	2	5
x				7
				5
			3	

- 3) Next we do 2×7 , add on the 3 that we carried, and carry the 1.

	0.	1	2	5
x				7
			7	5
		1	3	

- 4) Next we do 1×7 , add on the 1 that we carried. Make sure that you put the decimal in directly under the one at the top of the page.

	0.	1	2	5
x				7
		8	7	5
		1	3	

- 5) Finally, we do 0×7 , which is 0.

	0.	1	2	5
x				7
	0.	8	7	5
		1	3	

- 6) Have a go at these multiplications: 1.5×2 ; 2.02×3 ; 10.25×2 .

Extension

Multiplying decimals is very useful when calculating prices. If you have a toy catalogue, you could work out how much it would cost to buy two of some of the toys. How much would it cost to buy one each of your favourite toy for everyone in your house?

Frog Punch

Equipment:

Squared white board,
White board pen and eraser.

- 1) Below is my recipe for fruit punch. The frogs would like to make it, but they only have their measuring cups in millilitres. Can you convert all the litre measurements to millilitres for them?
There are 1000ml in 1l, so 10l would become 10,000ml.
- 2) One litre weighs one kilo. Can you convert the measurements into kilos for the elephants who don't have measuring jugs, but only have scales (don't forget to convert the spices too, they're in grams, and there are 1000g in 1kg)?

Fruit Punch

Ingredients:

0.5l orange juice,
0.75l apple juice,
0.005l lemon juice,
3g cloves,
2g cinnamon,
1g grated nutmeg.

Method

- Pour all the liquid ingredients into a large saucepan.
- Add the dry ingredients and stir.
- Warm gently on the hob, until it is steaming, but not boiling.
- Enjoy.

Extension

If you can, try measuring out the recipe and try it.

If you can look online, or in your library, find some American recipes and look at the units they use. Can you convert them to ml and g?

Exploring the World

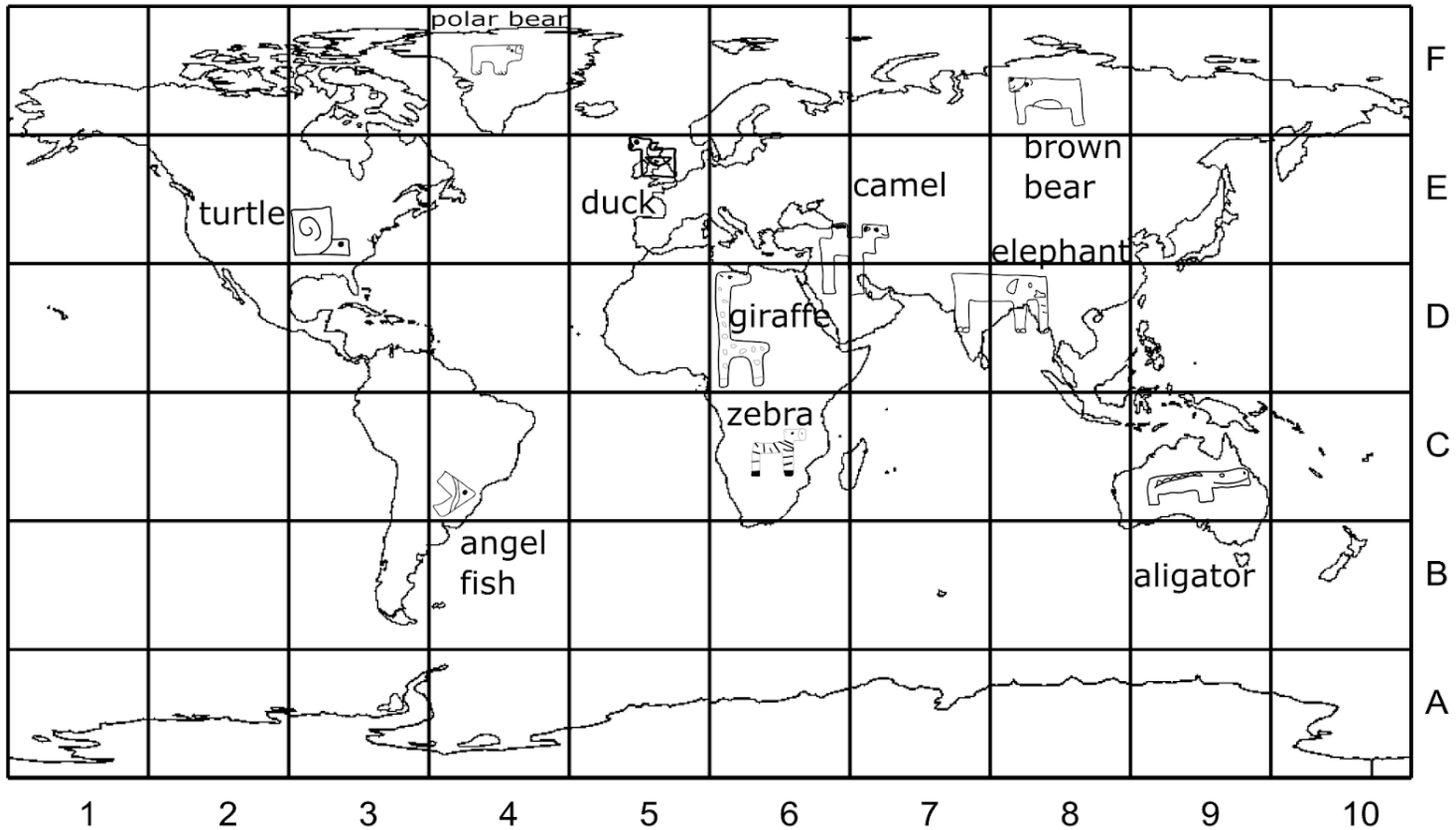
Getting the Animals Home

Equipment:

Wooden Animals

World Map

- 1) Look at the map below, it shows some of the wooden animals standing on their habitat. Put the wooden animals on your map.



- 2) Talk about where the animals are. Which animals are close together? Which animals are far apart?
- 3) Take the animals off the map, then try to put them back without looking at the map on this page.
When all the animals are on your map, check this page again to see if you were right.

Extension:

Go on the internet and see if you can find out more information about where the animals live. Can any of the wooden animals be found in other parts of the world?

If you have some toy animals at home, you could put them on the map too. Or you could draw some pictures of animals and lay them on the map to show where they live.

Time Snail

Equipment

Time snail sheet

- 1) This time snail represents the history of the world. The earliest part is in the centre of the snail's shell, we know the least about the time that's furthest in the past. As the spiral curves out, it gets wider; we have more information about the more recent past.
- 2) Take one finger and trace the path from the centre of the shell to the end, reading the different events that are mentioned.
- 3) Encourage your child to trace the spiral while you read the events again.
- 4) Talk about some of the events on the time snail. What happened after the Tudors? Can you find some things that happened before the Vikings?

Extension

Make your own time snail. Choose a period of time you know well, e.g. what you did last week, what happened in your favourite book. Draw a snail on a big piece of paper, start with the beginning in the centre of the shell and work outwards. When your snail is finished, tell the story to someone else, using the time snail to illustrate it. See if your listener understood the order of events by asking them some 'before' and 'after' questions.

Body Journey Digestion

Equipment:

Body sheet

Counters

- 1) Choose a counter and pretend it's some food. Have your child move the counter through the picture of the digestive system as you tell this story:

Food goes into the mouth, where it is chewed by the teeth and enzymes in the saliva begins to break it down. The food is swallowed and squeezed down the esophagus. When it reaches the stomach, the food is broken down even more by the stomach acid and enzymes. It travels into the small intestine, where nutrients are absorbed and taken into the bloodstream. The remaining food passes through the large intestine, where water is removed. The waste product goes out of the body via the rectum when the person goes to the toilet.

- 2) Once your child understands the story, ask them to retell it in their own words, while you move the counter. It can be more fun if you add a few sound effects, but try not to get louder than the story!

Extension

There are some fun cartoons online which you could watch to supplement your learning. If you've got an old t shirt or vest, try drawing the digestive system on it.

Night and Day

Equipment:

Globe

Window or torch

Calendar

1. During the day, the Earth rotates. Find where you live on the globe.
2. We're going to pretend that the window or torch is the sun. If you can, turn off any other lights. Hold the globe so that where you live is pointing at the 'sun' (window or torch). Now it is day time where you live.
3. Turn the globe (Earth spins Eastwards - so that the sun appears to rise in the East) so that where you live is facing away from the 'sun'. Now it is night time where you live.
4. Get out the calendar and set the clock to nine o'clock. Ask your child to hold the globe to show what nine o'clock in the morning might be like.
5. Set the clock on the calendar to ten o'clock. Ask your child to hold the globe to show what ten o'clock at night might be like.
6. Take it in turns to set the clock and turn the globe.

Extension

Find out (online or in the newspaper) what time the sun rises and sets at the moment where you live. Set the clock to sunrise and sunset times and try to show them with the globe - you'll need to position where you live so it is on the edge of shadow.

7.

Hot Cross Buns

Equipment:

Mini glockenspiel

- 1) We're going to learn how to play a simple tune on the glockenspiel. First you need to practise clapping a rhythm. Can you clap 1-2-3-rest, 1-2-3-rest?
- 2) Can you clap a faster rhythm, with each clap coming twice as quickly as the previous rhythm and no pauses: 1-2-3-4-5-6-7-8?
- 3) Once you can do this, you need to hit the same rhythm on the glockenspiel. Try just hitting one key first. 1-2-3-rest, 1-2-3-rest then 1-2-3-4-5-6-7-8 then 1-2-3-rest again.
- 4) Now it's time to put in the notes. The bars are different colours, the shortest bar is lilac, the second shortest bar is pink, the third shortest bar is yellow, and the longest bar is purple. The tune for Hot Cross Buns goes like this:

lilac-pink-yellow-rest, lilac-pink-yellow-rest,
yellow-yellow-yellow-yellow-pink-pink-pink-pink,
lilac-pink-yellow-rest.

- 5) Can you play the tune while your partner sings the words? Then swap places.
- 6) Have a go at making up your own tune.
- 7) Your glockenspiel will sound clearest if you hold it by the musical note handle as you play. If you put it on a table, the sound will be muffled. Try both ways and see if you can hear the difference.
- 8) What happens if you use one thumb to hold the metal bar still when you hit it with the mallet? You are stopping the metal bar from vibrating, which stops it from making a noise.

Extension

Look on the internet for other performances of Hot Cross Buns, do they have any ideas that you could use in your own performances?

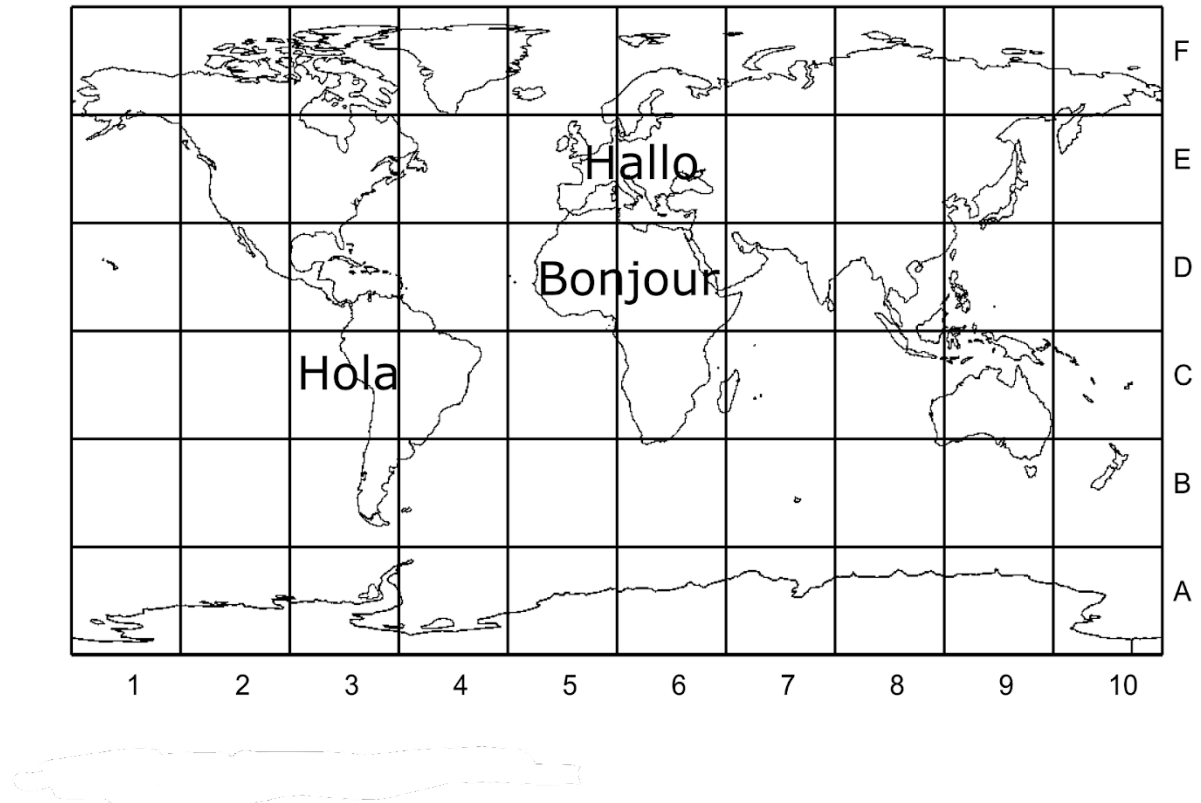
Hello World!

Equipment:

Map,

Wooden animals

- 1) Put your animals on the parts of the map with different ways of saying 'hello' (you can choose which animal goes where).
- 2) Hallo is German - spoken mainly in Germany. Bonjour is French - spoken in France, and in parts of Africa and Canada. Hola is Spanish - spoken in Spain and South America.



- 3) Can you get each animal to say hello in the language spoken in the area where it's standing?
- 4) Can you sort these ways of saying goodbye into the correct languages? Then get your animals to say them?

Au revoir
Auf Wiedersehen
Adiós

Extension

Online you can find sound and video clips to help you pronounce the words correctly.

Can you find out the names of the countries where these languages are spoken?

Can you find out how to say 'hello' in any other languages and add them to the map?

Magnets One

Equipment:

Magnets

Ruler

World map

- 1) Take the two magnets out of the box. Try to push the two red ends together, you should be able to feel the magnets resisting you. We call this repelling.
- 2) Try to push the two blue ends together, you should be able to feel the magnets repelling each other.
- 3) Try to push one red and one blue end together, you should feel the magnets pulling together. We call this attracting.
- 4) Put one magnet down on the table. Can you 'chase' it and make it move away without touching it with the other magnet, just using the repelling magnetic force? How close does the second magnet need to be before the magnet on the table moves?
- 5) Now try to 'pull' the magnet on the table, by turning the other magnet around. How far away can you hold one magnet and still manage to pull the other? If you lay the ruler next to the magnet on the table, you can measure how far away you can get.
- 6) Try repeating steps 4 and 5 on a different surface, lay the world map out on the table and try to chase and pull a magnet on top of that. It should be much harder to move the magnet, because there is more friction between the magnet and the map than there is between the magnet and the table.
- 7) If you have any other surfaces (like tiles, wood, carpet, or a sofa), try the same experiment on them.

Extension

If you can find a surface with very little friction, see if you can make one magnet spin round and round by 'chasing' the end with the other magnet.

Comparing Animals and People - Senses

Equipment:

Wooden animals

World map

- 1) Take it in turns to hide one of the wooden animals under the world map and let the other person try to guess which one it is by feeling through the map. Which of you has the keenest sense of touch?
- 2) Choose one of your wooden animals. Look at the animal's eyes. How are they different from and similar to your eyes?
- 3) Compare the other senses too. How do you and the animal touch things, smell things, hear things and taste things?
- 4) Can you think of any reasons why the animal's senses are different from yours? Are they a prey animal, that needs to hear hunting animals sneaking up on them? Do they need to be able to see fruit high up in trees?
- 5) Choose another animal and compare that to you and to your first animal. Which animal is most similar to you?

Extension:

Look on the internet or in some reference books to find out more about how animals and people sense things.

Have a taste test. Get three or four different drinks. Take it in turns to close your eyes and taste one of the drinks. Who's best at guessing what they're drinking without looking?

Travelling Animal

Equipment:

World map

Wooden animals

Globe

- 1) Pick your favourite of the wooden animals, it's going to go on a journey. As the adult tells the story, the child should move the animal around the map.
- 2) The journey starts in North America. Your animal was having a bit of a wander around, and decided it fancied somewhere hotter. So, it walked South, all the way to South America. When it got there, it felt very hot indeed, so it decided to go for a swim. It jumped into the Atlantic and set off, swimming North East, until it got to the United Kingdom.
- 3) Encourage your child to have a go at telling their own story, while you move the animal - if necessary ask for clarification in the directions, should you go North, South, East or West?
- 4) Take another animal journey, using the globe rather than the map. Be careful, whichever way you hold the globe, North is still towards the North Pole!

Extension

Make a story book of your animal's adventures. You could look online to get inspiration for what the scenery looks like in different parts of the world. Try to include weather that is typical for the local climates. You could even find out about some landmarks for the animal to visit.

Examining the Time Snail

Equipment:

Time snail sheet

- 1) Choose two pictures on the time snail and compare them. What differences can you see between them?
- 2) Now pick one of the following topics and find as many examples as you can on the snail: clothes, weapons, methods of travel, art. How has this topic changed over time? What were the first ones like? How were the next ones different? What are they like now?

Extension

Research, using books or the internet to find out more details about your chosen topic. Make a time snail of your own, focussing on your chosen topic. Chose a famous person from history and make a time snail of their life.

Body Journey Respiration

Equipment:
Body sheet
Counters

- 1) Choose a counter and pretend it's some oxygen in the air. Have your child move the counter around the picture of the respiratory system as you tell this story.

You breathe oxygen in when you breathe in air, through your mouth and your nose. Your rib cage rises and your diaphragm drops, making your lungs inflate, pulling the air down your trachea. The trachea branches into your left and right lungs, and then bronchial tubes continue splitting again and again, like branches on a tree. The air travels down these increasingly small tubes, the bronchioles until it reaches the alveoli - which are like tiny balloons. Oxygen passes through the walls of the alveoli, and goes into the blood. First the blood is pumped to the heart. It goes along the pulmonary vein, into the left atrium, down into the left ventricle, and then it is pushed out through the aorta to travel through the body, along the arteries, to where it is needed. All the cells of the body need oxygen, but each molecule of oxygen can only travel to one cell. This one is going down the body to the feet. When it reaches a cell that needs oxygen, the oxygen is taken into the cell and used in respiration - the way the body makes food and oxygen into energy and carbon dioxide. *Now the child should swap their counter for a different counter, which will represent carbon dioxide.* The carbon dioxide travels back up the body, via the bloodstream, through the veins, and into the heart through the vena cava. It enters the right atrium of the heart, goes through the right ventricle and is pushed out through the pulmonary artery towards the lungs. At the lungs, the carbon dioxide passes through the walls of the alveoli, back up through the network of bronchioles, getting ever wider this time, until it leaves the lungs. Your diaphragm rises and your rib cage descends, making the lungs smaller and pushing the air up, through the trachea, and out of the mouth or nose.

- 2) Once your child understands the story, ask them to retell it in their own words, while you move the counter. They don't need to learn all the technical terms, but it's worth retelling the story until they can remember some and use them in telling the story themselves.

Extension

If you have some red and blue balls or toys, you can make a giant version of the body picture. Lay out a hoop, or cushion to be the heart; two rugs or sheets to be the lungs; and other cushions to be the mouth and the foot. If you have enough strings or ropes, you could lay them out to join the different body parts together - remember the blood travels through one set of arteries to get away from the heart and another set of veins to get back to the heart, but the air travels up and down the same trachea whether it's entering or leaving the lungs. Once you have your giant body map set up, put all the red balls on the lungs to represent oxygen and all the blue balls on the feet to represent carbon dioxide. The child can pretend to be a red blood cell, carrying oxygen from the lungs, to the heart, then down to the feet, where they should swap their 'oxygen' for 'carbon dioxide'. Then they can carry the carbon dioxide from the feet, to the heart, and back to the lungs for another swap.

Seasons

Equipment:

Globe

Calendar

- 1) Inflate the globe. We're going to pretend that you are the sun, sit on the floor, where your adult has enough space to walk all the way around you.
- 2) Stand on one side of your child, holding the globe in your hands, with the UK facing towards the 'sun' (your child). The Earth is actually slightly tilted on its axis (23.4°) - if you hold it so that the North Pole is pointing at where one o'clock would be, if you had a clock there, it's about right.
- 3) During the day, the Earth rotates around its axis (the imaginary line that runs from the North to the South Pole). Have a go at demonstrating this.
- 4) When you are comfortable with this action, ask the child to tell you when they can see the UK and when it disappears from their view. The UK should be visible for more of the rotation than it is hidden for. That's how the Earth is positioned when it is Summer in the UK.
- 5) Now, very carefully, holding the globe so that it is still tilted the same way, walk around your child so that you are on the other side of them (your North Pole should still be at one o'clock, but now it should be pointed away from the 'sun'). Ask the child to turn so that they can see you again.
- 6) Now rotate the globe around its axis again, and ask the child when they can see the UK and when it disappears from view. The UK should now be visible for a smaller proportion of the rotation than it is hidden for. That's how the Earth is positioned when it is Winter in the UK.
- 7) Have a go at representing the Spring and Autumn, by standing at the points on your orbit that are midway between Summer and Winter.
- 8) Let your child have a go at moving the Earth, while you pretend to be the Sun.
- 9) Get the wooden calendar and look at the four seasons. Talk about how the weather changes and how the length of day changes with the seasons. Talk about what we wear in different seasons, and things we celebrate in different seasons - what season(s) are your birthdays in?

Extension

Choose a place you visit a lot - your garden or a local park - and take a photo every season for a year.

Compare the pictures and talk about the effect that the seasons have on your local area. Encourage your child to draw their own pictures of the seasons.

Magnets Two

Equipment:

Magnets

Wooden animals

White board

Balance kit

Foam letters

- 1) Get out your wooden animals, white board, and the numbers from your balance kit. Do they stick to your magnet?
- 2) Try the foam letters. Which side sticks best to the magnet? The foam is quite thin, so it might not make any difference.
- 3) If you can, collect some other materials from around your house and see if they stick to your magnets. Try and predict whether they will stick to your magnet before you experiment to see if you were right.
- 4) Do you notice anything about all the things that stick to your magnet? It can be hard to see, because sometimes it's covered by another material, but everything that sticks to a magnet is made of metal.
- 5) Do all metals stick to magnets? Only ferrous metals stick to magnets. Iron and Nickel are the ferrous metals that are most likely to be in anything in your house that's magnetic.

Extension

If you have paperclips, see how many your magnet will hold.

If you have a paperclip and a piece of card, try drawing a maze on the piece of card and put a paperclip in the middle of the maze. Holding the magnet underneath the card, try to guide the paperclip out of the maze.

Do You Like It?

Equipment:

Wooden animals

- 1) Get out the wooden animals.
- 2) Choose a language: French, German or Spanish.
- 3) Look at the correct column in the table below. Read the phrases in that language together.
- 4) Note that all the languages except English have more than one word for 'the'. This is because they are all gendered languages. The nouns are feminine or masculine (in German, they can also be neuter). Make a list of the different words for 'the'.
- 5) Take it in turns to be the asker or the responder. The asker should ask do you like animal name, and the responder should reply with yes, I like animal name or no, I don't like animal name.
- 6) Ask the same question, but just use 'that' and point to the thing you are asking about. You can play this game with all sorts of things to practise your language skills and build your vocabulary.

English	French	German	Spanish
Do you like . . .	Est-ce que tu aimes . . . (<i>ess-suh kuh two ems</i>)	Magst du . . . (<i>mag-st doo</i>)	Te gusta . . . (<i>teh ghost-a</i>)
Yes, I like . . .	Oui, j'aime . . . (<i>wee, jem</i>)	Ja, ich mag . . . (<i>yar, ick, mag</i>)	Si me gusta . . . (<i>see, meh ghost-a</i>)
No, I don't like . . .	Non, je n'aime pas . . . (<i>kno, juh nem pah</i>)	Nein, ich mag . . . nicht (<i>nine, ick mag . . . nicked</i>)	No, no me gusta . . . (<i>kno, meh ghost-a</i>)
That	Ça (<i>sah</i>)	Das (<i>das</i>)	Eso (<i>esso</i>)
The bird	L'oiseau (<i>l-waz-oh</i>)	Der Vogel (<i>der foh-gull</i>)	El pájaro (<i>elle pah-hair-o</i>)
The elephant	L'éléphant (<i>lel-ee-fon - like in font, but without the t</i>)	Der Elefant (<i>der elee-fant</i>)	El elefante (<i>elle elle-eh-fant-ay</i>)
The giraffe	La girafe (<i>lah gee-raf</i>)	Die Giraffe (<i>dee gi-raff-en</i>)	La jirafa (<i>la hi-raff-a</i>)
The zebra	Le zèbre (<i>le zeb-ruh</i>)	Das Zebra (<i>das zeb-ra</i>)	La cebra (<i>lah seb-rah</i>)

Extension

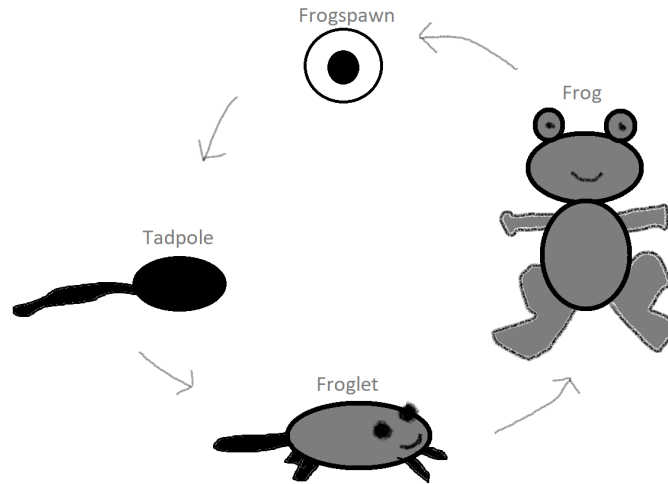
Why not get a language dictionary out of the library and find out some more words in your chosen language? You could find out your favourite and least favourite foods. Then set out a buffet and serve one another, be sure to ask 'do you like' before you put each item on your partner's plate.

Comparing Animals and People - Lifecycle

Equipment:

This book

1) Here is the life cycle of a frog:



- 2) How is it similar to the life cycle of a human? How is it different from the life cycle of a human?
- 3) Humans have eggs, but they are inside the mother's body. Baby humans don't have tails. We both grow into adults before we can have babies.

Extension

Can you draw the life cycles of other animals? You can find life cycles in reference books or online. Maybe you could find butterflies, fish or chickens.

What's it Made From?

Equipment:

Everything in the box!

- 1) Have a look at all the things in the box. Can you find anything made from wood? Can you find things made from plastic? What about metal, fabric and card?
- 2) Why might these things be made from these materials? Why are the magnets metal? Why isn't the globe metal?
- 3) Can you find any things in your house that are made from the same materials as the things in the box? Can you think of any reasons why they might be made from these materials?
- 4) Design your own toy and think about what it should be made from.

Extension:

Can you find some things in your house that are made from glass or rubber? Why do you think they are made from these materials?

When you've designed your toy, talk about whether you might be able to really make it. Do you have to change some aspects of the design to make it easier to make?

Seasons Two

Equipment:

Calendar

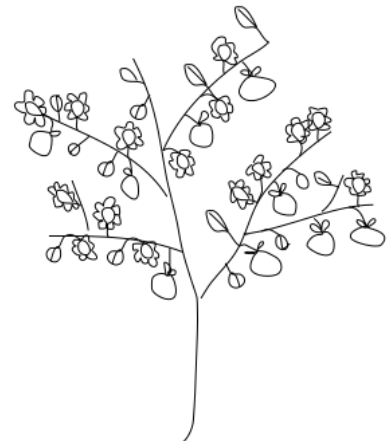
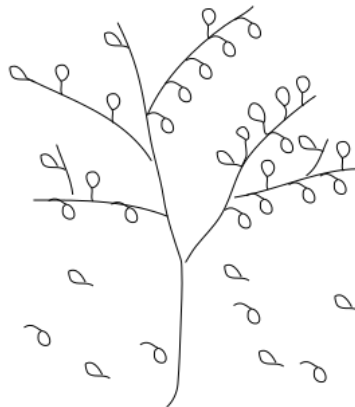
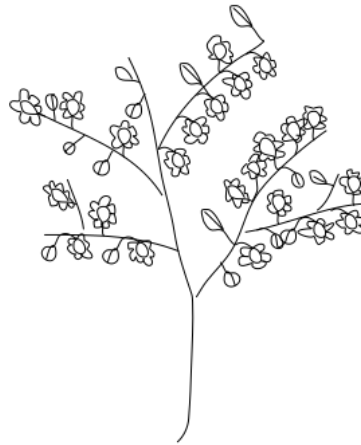
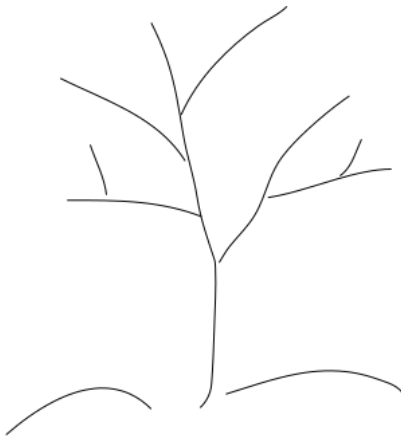
- 1) Look at the calendar and talk about what the weather is like in different seasons.
- 2) Below are pictures of a deciduous tree in different seasons. Can you match the seasons to the pictures?

Spring

Summer

Autumn

Winter



Extension

Find a plant in your garden or a nearby park and visit it once in every season. Draw a picture of what it looks like. If you have card and wool, you could try making thread pictures of the plant in different seasons.

Changing Shapes

Equipment:

Foam die

World map

Geometric shapes

- 1) Have a look at the foam die, the world map and the geometric shapes. Choose which ones to use and build a tower.
- 2) Why did you use those objects to build your tower?
- 3) Separate out the smallest geometric shapes. What could you use to carry them easily: the die, the map, or the other shapes? Why?
- 4) Which of these objects can be squashed?
- 5) Which of them can be twisted?
- 6) Can you think of any other ways you could use the geometric shapes, the foam die and / or the world map? How many uses can you think of for them?

Extension

Find some other things in your house that can be squashed and twisted. How many different uses can you think of for them?

Comparing Animals and People - Food

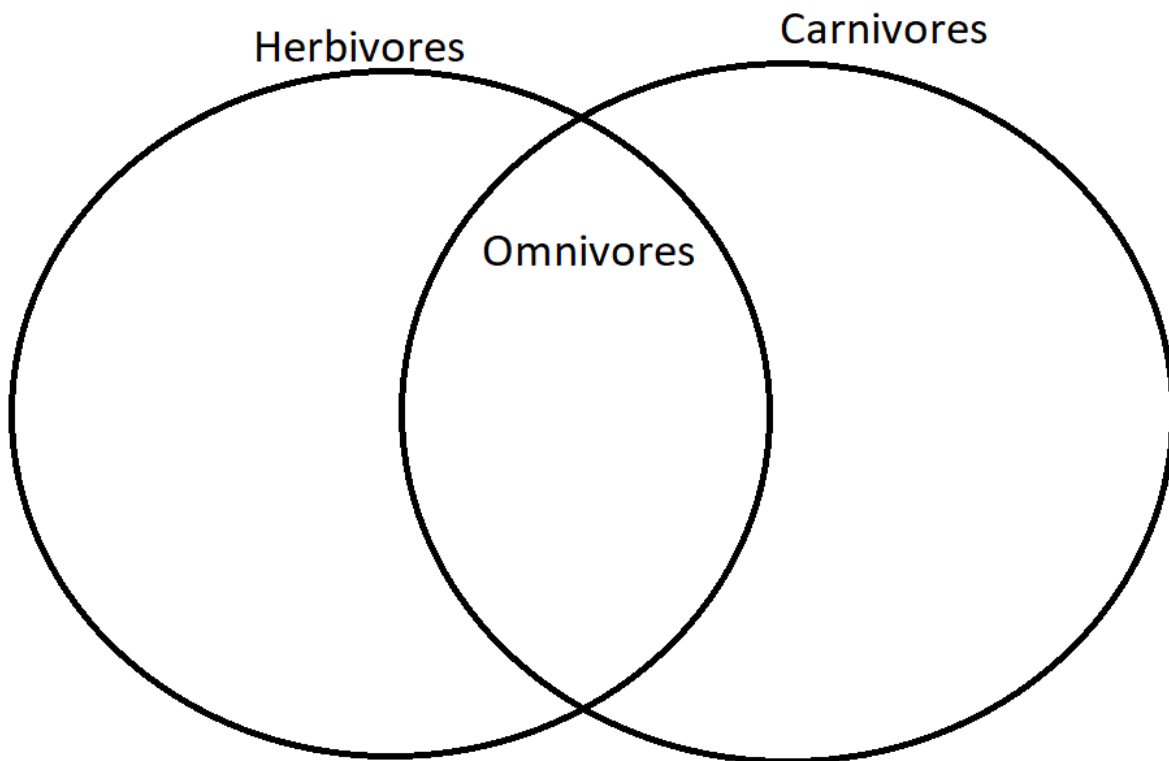
Equipment:

Wooden animals

White board

White board pen and eraser

- 1) Do you know what the animals eat?
- 2) Which ones eat meat? These are carnivores.
- 3) Which ones eat plants? These are herbivores.
- 4) Are there any animals that eat meat and plants? These are omnivores. Humans are omnivores (even if some humans, like vegetarians and vegans choose not to eat meat, all humans can get energy from meat).
- 5) Draw a venn diagram, like the one below and put your animals where they belong.



Extension

If you have other animal toys, try and group them into carnivores, herbivores and omnivores.

Skeletons and Muscles

Equipment:

Body sheet,

Your arms and an adult's arms

- 1) Our skeletons hold us up. Most of our bones are covered with layers of muscle and fat, but some are close to the surface of our skin. Can you feel any of your bones? Try your rib cage, your collar bones, your wrist bones and your ankle bones. You can use the body sheet to work out where your bones are. Can you feel any more of your bones? Which bones can't you feel?
- 2) Our muscles often work in pairs: one pulling the bone one way and its partner pulling the bone back in the opposite direction. Put your hands on an adult's arm, just behind their elbow as they bend and straighten their arm. Can you feel the muscle contract (and bulge) as the adult bends their arm?

Extension

If you have a tape measure, try to measure the circumference of their arm at the same point when it is straight and when it is bent. Ask your adult to measure the circumference of your arm when it is straight and when it is bent.

If you have a packet of post-it notes, or some small pieces of paper and some tape, try to label your bones and stick them in the right places on your body, or your adult's body. This is a good opportunity to practise being aware of other people's personal space, always check before you stick things on other people!

Plants - Life Cycle

Equipment:

This book

White board

White board pen and eraser

1) The life cycle of an oak tree goes as follows:

Acorn ---> Sprout ---> Seedling ---> Oak Tree ---> Acorn

2) Can you rearrange the words below, to make the life cycle of a chestnut tree?

Sprout, Chestnut, Chestnut Tree, Seedling

3) Can you work out the life cycles of other types of tree, like apple, pine, or sycamore?

Extension

Grow a plant from seed - cress is very easy.

Comparing Animals and People - Moving

Equipment:

Wooden animals

White board

White board pen and eraser

- 1) Look at your wooden animals one by one and talk about how they move. Do they run, hop, fly or swim?
- 2) Take it in turns to pretend to be one of the wooden animals and move around as much like that animal as you can. Can the other person guess which animal you are trying to be?
- 3) Which animals is it hardest to pretend to be?
- 4) Look at the shape of the animals. What shape is good for flying, what shape is good for swimming? What do animals need to hop or to run?
- 5) Draw some imaginary animals of your own and think about how they move. Flying animals will need strong wings and light bodies. Swimming animals will need fins, or tails to propel them in the water. Jumping animals and running animals will need strong legs.
- 6) Take it in turns to pretend to be one of your imaginary animals and try to move around the room like they move. Can the other person guess which you are trying to be?

Extension

You could watch nature documentaries and see how animals move in the wild. You could also see if you can find some ways that humans can use technology to imitate some animal adaptations. A trampoline can help us jump as high as kangaroos. Flippers can help us swim almost as quickly as dolphins. A ladder can help us to see as far as a giraffe. Cars can help us move even faster than cheaters.

Parts of a Flower

Equipment:

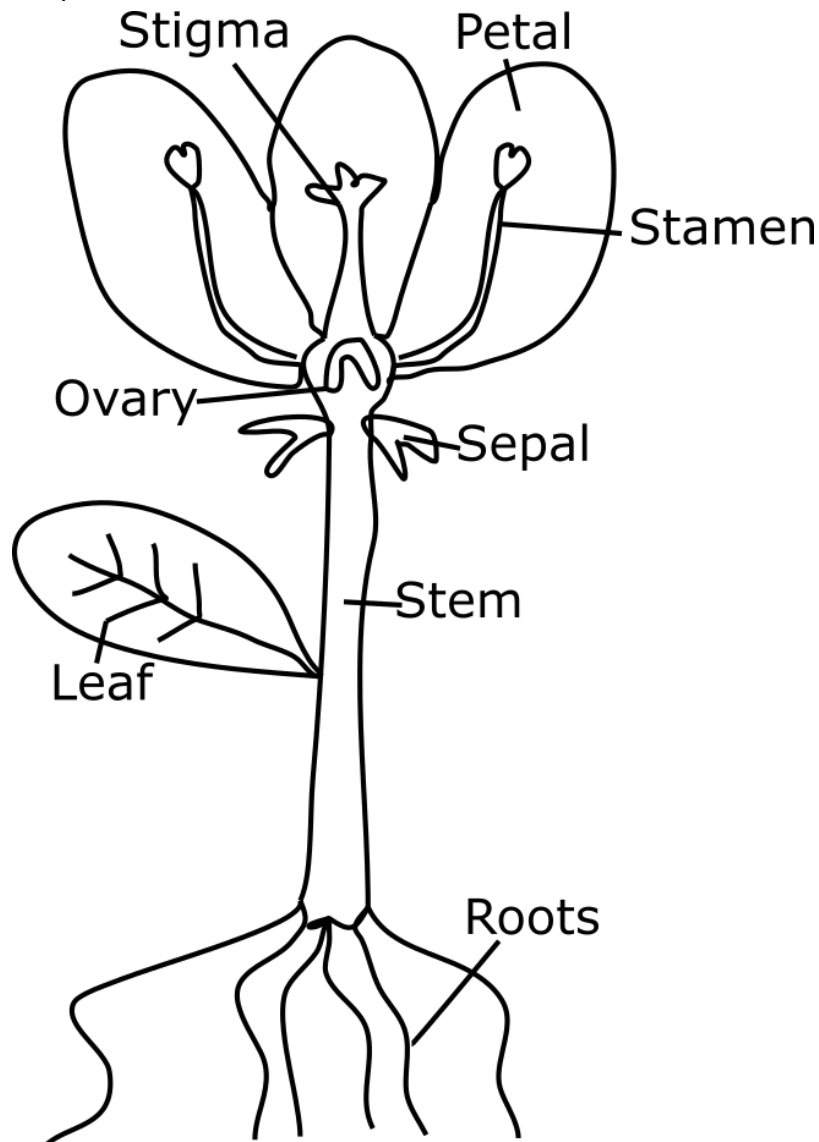
This book

White board

White board pen and eraser

Foam Letters

- 1) Here is a picture of a flower with its main parts labeled. Take it in turns to draw a flower on the white board for the other person to label.



- 2) Get the foam letters and take it in turns to lay out the letters to make one of these words, muddle up the letters so that the other person can rearrange them to make a word:

Roots, Stem, Leaf, Petal, Stigma, Stamen, Ovary

Extension

If you can get some flowers, either from your garden, or the garden of someone you know, try dissecting a flower. See if you can find all the parts listed above. First, take off all the petals and the leaves. See if you can identify the stigma and stamen. Then, very carefully, slice down the centre of the stem and through the centre of any ovary you can see. You might be able to see the ovules inside the ovary.

Animal Habitats

Equipment:

White board

White board pen and marker

- 1) Here's a habitat for a zebra, it contains everything a zebra needs: grass to eat, water to drink, a warm climate, other zebras for company, and a tree to offer some protection from predators.



- 2) Can you think of another animal that would be happy to live in this habitat?
- 3) Can you draw a different habitat for another animal?
- 4) Can you think of another animal that would be happy to live in your habitat?

Extension

If you have a small box and some card, you can make a model of a habitat, rather than just a drawing. Can you make a habitat for one of your wooden animals?

Visit your garden or a local park. Every space like this contains micro habitats. If you lift a big stone or roll aside a log, you should be able to find a microhabitat with lots of little creatures that live there. Try to find the things that make their habitat suited for them. Is there a food source? Is there shelter from predators? Is there a way to stay warm in winter or cool in summer?

If you find a pond, you could try pond dipping. You'll need a clean basin and a net. Collect some pond water in your basin, then use your net to scoop up some creatures, and gently put them into your basin. Watch the creatures you have found. How many different types are there?

Staying Healthy - Physically

Equipment:

White board

White board pen and eraser

- 1) Humans, like other animals, need: oxygen, food, water, shelter, and exercise to stay healthy. We don't always get them from the same places. Can you sort out these sources of basic needs into the right columns, to show how humans and fish get their needs met?

Sources: Oxygen in Air, Oxygen in Water, Tap, Pond, Potatoes, Pond Weed, Stone, House, Running, Swimming.

Need	How Fish Meets Need	How Human Meets Need
Oxygen		
Food		
Water		
Shelter		
Exercise		

- 2) Can you think of any other ways that people can get these needs met?
- 3) Can you think of the ways that other animals meet these needs?
- 4) Swimming can be a source of exercise for both fish and humans. How many sources can meet the needs of both humans and animals?

Extension

Keep a diary of the food you eat for a week and a diary of the food your (or someone you know's) pet eats for a week. Are there any similarities? What differences are there?

Shopping Around the World

Equipment:

White board,

White board pen and eraser

- 1) Draw some things you might want to buy on holiday on the board, e.g. an ice cream, a postcard, a sun hat.
- 2) Choose a language: French, German or Spanish.
- 3) Look at the correct column in the table below. Read the phrases in that language together.
- 4) Take it in turns to be the shop assistant or a customer. Play shops in your chosen language.

English	French	German	Spanish
May I have that please?	Puis-je avoir ça, sil vous plait? <i>(pwee-jay avoir sah, sill voo play)</i>	Darf ich das bitte haben? <i>(darf ick das bitter haben)</i>	¿Puedo tener eso por favor? <i>(pwee-do tenner esso pour fah-voor)</i>
Yes	Oui <i>(wee)</i>	Ja <i>(yar)</i>	Si <i>(see)</i>
No	Non <i>(kno- like knock, without the ck)</i>	Nein <i>(nine)</i>	No <i>(kno- like knock, without the ck)</i>
Thank you	Merci <i>(meh-see)</i>	Danke <i>(danker)</i>	Gracias <i>(gra-sea-ass)</i>

Extension

If you would like bit more of a challenge, you could find more vocabulary online or in a foreign language dictionary, you could try asking how much things are, or ask for several of them.

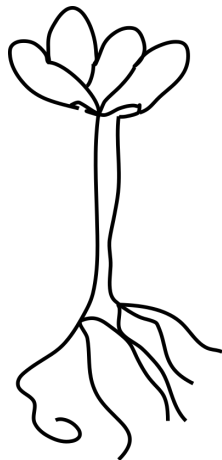
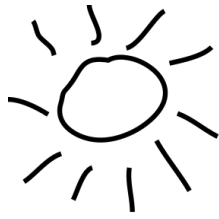
You can also find cartoons online in different languages, have a look and see if you recognise any words you know.

What Plants Need

Equipment:

This book

- 1) Plants need: nutrients from the soil, water, sunshine and oxygen to grow. How could you rescue the plants in danger below?



- 2) Different environments pose different difficulties for plants. Which need will it be hardest for a plant in the desert to meet? Which need will it be hardest for a plant on a cliff top with very little soil to meet? Which need will it be hardest for a water plant to meet?

Extension

Try growing a plant in the dark for a week or two - remember to water it. Look at what happens to the plant. Pay attention to the colour of the leaves and the direction in which the plant grows. Does the plant manage to solve its problem and find some sun light?

Food Chains

Equipment

White board

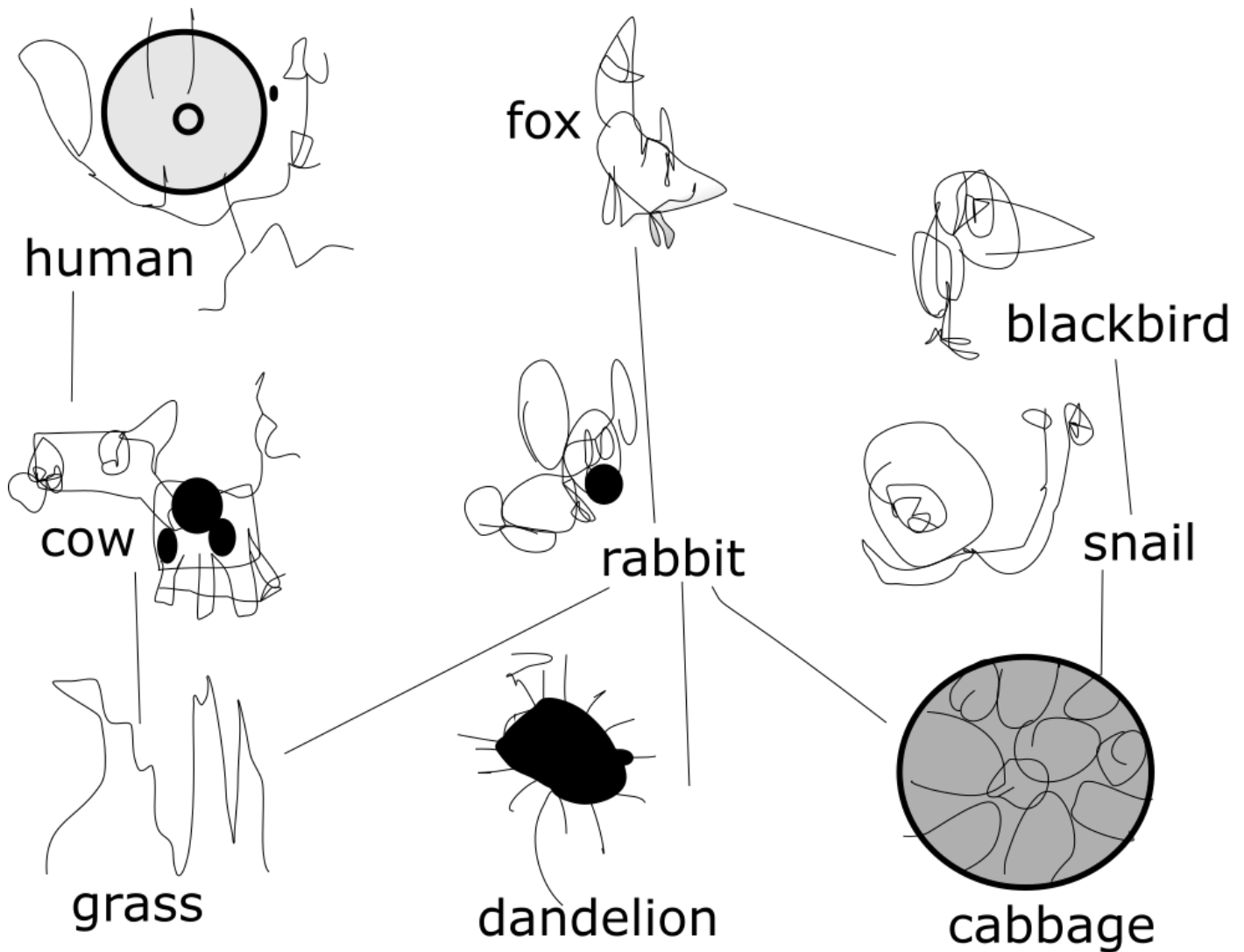
White board pen and eraser

Wooden animals

- 1) Here is a simple food chain:

Sun ---> Cabbage ---> Snail ---> Blackbird ---> Fox

- 2) Can you think of anything else that could go in the space where cabbage is? Is there anything else that snails like to eat?
- 3) Can you think of anything else that could go where blackbird is? Is there anything else that eats snails and gets eaten by foxes?
- 4) If you add some alternatives, you can make a food web, like this:



- 5) Can you make your own food chain? It always starts with the sun, because that's where plants get their energy. And, since only plants can get energy from the sun, the second thing has to be a plant; but there are lots of possibilities!
- 6) When you've made your own food chain, can you think of some more things that would fit in that habitat and try to turn your food chain into a food web?

Extension

Write down everything that you eat at one meal, and draw a food chain for all of those things (you will be the last item, because nobody is going to eat you!).

Keeping Healthy - Mentally

Equipment:

White board,

White board pen and eraser

- 1) To stay healthy mentally, humans need: occupation, connection and purpose. Make three columns on the white board and think of as many sources of these things as you can. There are some ideas below to get you started.

Occupation	Connection	Purpose
Doing Maths	Chatting to a Friend	Helping Your Parents
Reading a Book	Stroking a Pet	Making Art

- 2) Tick all the sources that you use to keep yourself mentally healthy.

Extension

Keep a 'Connection Diary' - write down all the ways that you make connections with others for a week.

Then you could make a bar chart to show how many days you connected in the different ways. Which ways do you connect most often? Looking over your diary, is there anything that you would like to do more often?

Where in the World?

Equipment:

World map,

Globe,

Wooden animals

- 1) Take it in turns to place a wooden animal anywhere you like on the map. Then ask "Where in the world is . . ." and name a place e.g. the Atlantic Ocean or India (don't name the place your wooden animal is standing).
- 2) Your partner should give directions for you to move your wooden animal until you reach the place you stated. You should try to give directions using the compass directions, e.g. 'move one square North,' or 'move three squares East'.
- 3) The partner giving the directions could use the globe to help them find places, if they can't remember where they are. The globe is already labeled.
- 4) When you are good at this version, add in the midway compass points: North East, North West, South East and South West - these would move your animals diagonally.

Extension

Take the game outside to a garden or park. If you have a compass, you could use that to find which way is North. Otherwise, just remember that the sun rises in the East. Take it in turns to ask 'Where is my snack? Or 'Where is the back door?' and to direct your partner to the place they ask for 'Take three steps North and one step East'.

How Plants Breed

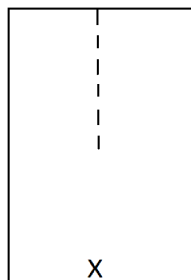
Equipment:

This book

- 1) Plants often need to be pollinated so that they can breed. They need the pollen from one flower to get to the stamen from another flower. Bees, butterflies and bats frequently carry pollen. So, we call these animals pollinators. They don't do it deliberately, though, it just happens when the pollinator is travelling around, feeding from different plants. What things might stop a pollinator from getting the pollen safely from one plant to another?
- 2) The pollinator might be eaten, or get caught in a rainstorm that washed off the pollen. It might not visit another plant of the same species, so the pollen wouldn't fertilise anything. How do you think flowers manage to breed despite all these (and other) hazards? If you were a plant, how might you solve these problems? Most plants produce lots and lots of pollen, so that it doesn't matter if only a little bit makes it to the right place.
- 3) Many plants produce seeds. Because plants don't move about very far, they often use other things to spread their seeds around so that they have plenty of space to grow. Can you think of how plants could help their seeds to spread? If the seeds are in a suitable place, they grow into a new plant. How do you think the plants compensate for all the times that the seeds don't land in a suitable place?
- 4) Some plants use animals to carry their seeds. These plants make fruits, which the animals eat, then, the animals move away somewhere else, and when they poo the seeds come out and land on the ground. How might plants tempt animals to eat them? Are there any fruits that you eat, what tempts you to eat them?
- 5) Other plants use animals in a different way, by having seeds that are sticky or bristly and attach themselves to the animals' coats. What might make these seeds fall off and land on the ground where they could grow?
- 6) Some plants use the wind to carry their seeds. The wind blows seeds away from the plant. These seeds need to be small and light. Have you ever seen anything blown away by the wind? Why did it blow away?
- 7) Look at the pictures of seeds below and see if you can work out how they are spread.

Extension

You can make a model of a sycamore seed with paper and a paperclip. Cut the paper into the shape below; cut along the dotted line and fold the flaps in opposing directions; put a paperclip on the bottom, where the 'x' is. Stand on a chair and drop the model seed. It should catch the air and fly like a real seed.



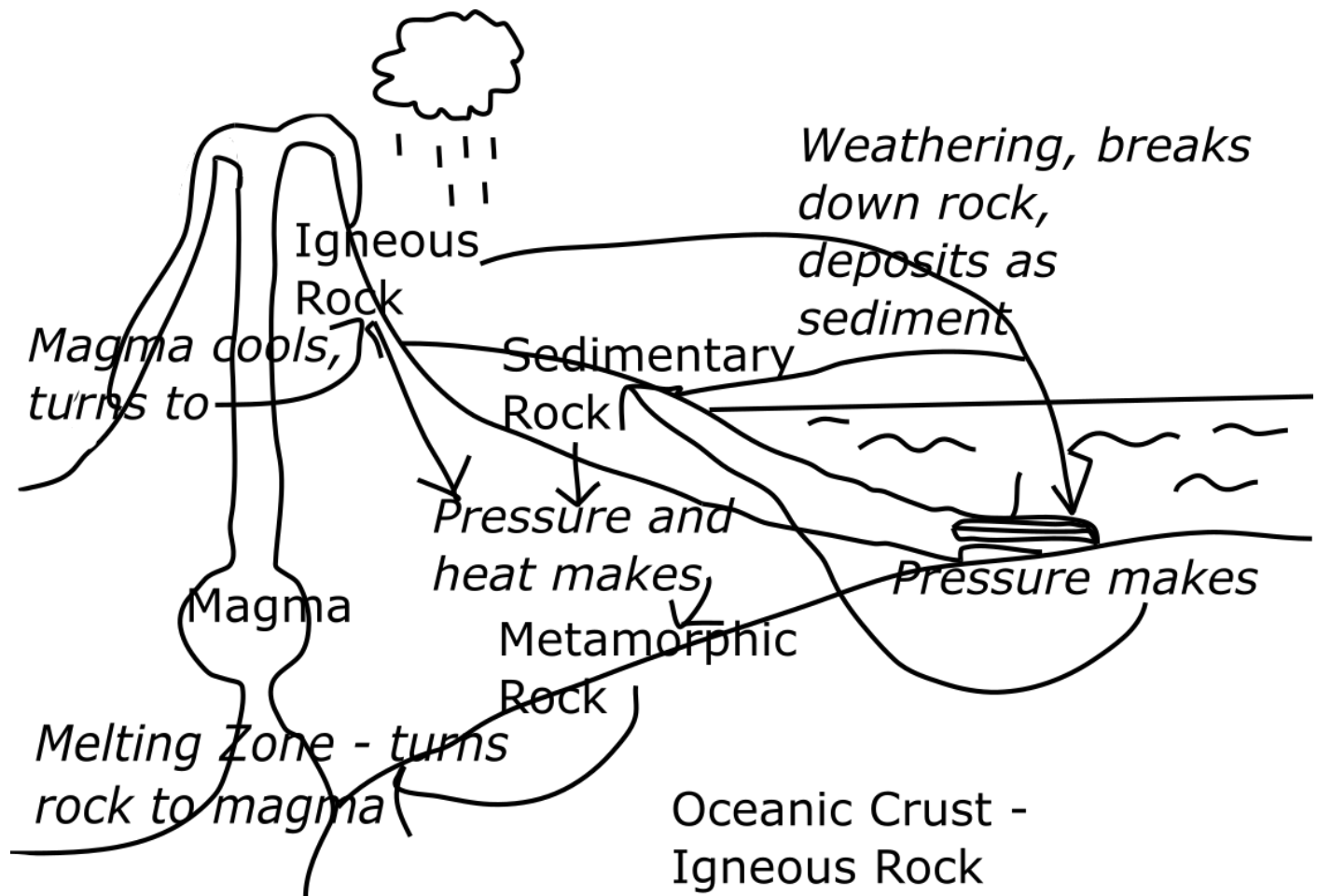
Take a walk and see if you can find any seeds. Guess how the seeds you find are dispersed. You should be able to check the internet, or ask a gardener, to see if your guess is right.

Rocks Two

Equipment:

This book,
Counters,
White board,
White board pen and eraser

- 1) The rock cycle shows us how one type of rock can change into another. Put your counter on one of the types of rock, then follow the arrows to tell the story of your rock.
- 2) Then put your counter on a different start point and see if you can tell a different rock story.
- 3) Choose your favourite rock story and write it down.



Extension

You can make a chocolate rock cycle if you have these ingredients and pieces of equipment: white chocolate, milk chocolate, dark chocolate, cheese grater, plastic zip-lock bag, rolling pin, mug of hot water, tea towel.

First grate your chocolate - this is the equivalent of weathering. Layer the different colours inside the zip-lock bag, so that your chocolate is striped, then put it on the table and use the rolling pin to press it down to make chocolate sedimentary rock. Very carefully, lower the bag into the hot water, then lift it straight out again, fold the chocolate inside the tea towel and press down to make chocolate metamorphic rock. Finally, dip the bag back into hot water, leave it for a count of thirty, so that it melts completely. Lift it out and leave it to cool and harden into chocolate igneous rock. If you're brave, you can eat it!

If you don't have chocolate, or don't want to experiment with it, you can do the same thing with three different coloured crayons.

Shadow Puppets

Equipment:

The box,

Wooden animals

- 1) If possible, turn off all but one of the light sources in the room.
- 2) Use the box as a screen. Hold a wooden animal between the box and a light source (e.g. a torch or the window). The animal should cast a shadow on the box.
- 3) Keeping the light source and the box still, move the animal closer to the light source. What happens to the size of the shadow?
- 4) Now move the animal further away from the light source, what happens to the size of the shadow?
- 5) Try using a different coloured animal. Does the colour of the shadow change?
- 6) Can you make up a short shadow puppet show? Maybe it could be about a shrinking animal.

Extension

If you can, go outside at several different times on a sunny day and watch what happens to your own shadow. Whereabouts in the sky is the sun when your shadow is shortest? Whereabouts is it when your shadow is longest?

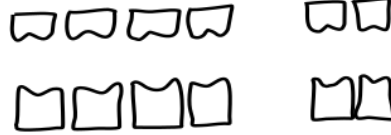
Teeth

Equipment:
Your teeth

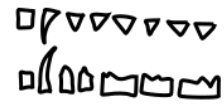
- 1) Look at these sketches of animal teeth. What do the animals eat?



Tiger



Zebra



Racoon

- 2) What differences can you see between the animals' teeth? Can you see any similarities?
- 3) Sharp teeth are good for tearing and slicing meat, broad teeth are good for grinding and crushing plants and grains. What kind of teeth do you have?
- 4) Partner up with an adult and look at one another's teeth. Can you count how many teeth a child and an adult have?
- 5) A complete set of adult teeth is 32; and a complete set of child teeth is 20. But, there are lots of reasons why people might have more or less teeth than that. Can you think of any? Who might have between 20 and 32 teeth? Who might have less than 20 teeth?
- 6) Get as many people as you can and count how many teeth they have, and plot the results on a bar chart.
If you don't have a lot of people, you can use these results from my house. There are six people here, and we have these numbers of teeth: 12, 24, 28, 28, 30, 31. Can you guess our ages? (We have one toddler, one child, two teenagers and two adults.)
- 7) Should vegetarians have flatter teeth than meat eaters? What do you think decides the shape of our teeth: our individual diet or our genes?

Extension

Take a single bite out of some different foods and see what pattern your bite mark makes. What food gives the clearest bite mark? You could try cheese, bread and an apple.

Get everyone in your house to take a bite out of a different piece of bread and see if you can work out which bite mark came from which mouth. If you don't have enough people in your house, you could try to match marks from biscuit cutters instead.

Solids, Liquids and Gases

Equipment:

Counters

- 1) What's the smallest thing that you have ever seen?
- 2) Everything is made of molecules, which are little bits too small for anyone to see with their eyes, or even with a normal light microscope. But, the way that those molecules behave causes changes that are big enough to see. For example, how close together molecules are determines whether things are solid, liquid or gas. In solids, the molecules are very close together, and they don't move very much at all. In liquids, molecules are further apart and they move around, that's why liquids spread out and can be poured. In gases, molecules are much further apart and move a lot, which is why gases will escape anything that isn't very well sealed. Get out the counters and try to demonstrate the arrangement of molecules in solids by stacking them to make a lump; in liquids by 'pouring' them from one hand to another (solids in lots of tiny pieces can be poured almost like liquids); in gases by tossing five counters in the air to see them move wildly.
- 3) You always have all these states of matter with you. Your nails are solid. Your saliva is a liquid. Your breath is a gas. Can you think of any other parts of you that are solids, liquids or gases?
- 4) Can you think of any other substances around you that are solids, liquids or gases?
- 5) If you open your mouth and blow hot air onto your palm, your palm will feel wet. The water vapour in your breath condenses on your hand (turns into a liquid). Have a go.
- 6) Can you think of any other times that you have changed something from one state of matter into another? You might have done some cooking, put something in a freezer, lit a candle, or taken something outside on a hot day.

Extension

If possible, have a go at changing things from one state of matter to another. If you can, take some ice - or an ice lolly - and melt it. Where does it need to be to stay solid? Where does it need to be to melt? Can you think of a way to speed up the melting process?

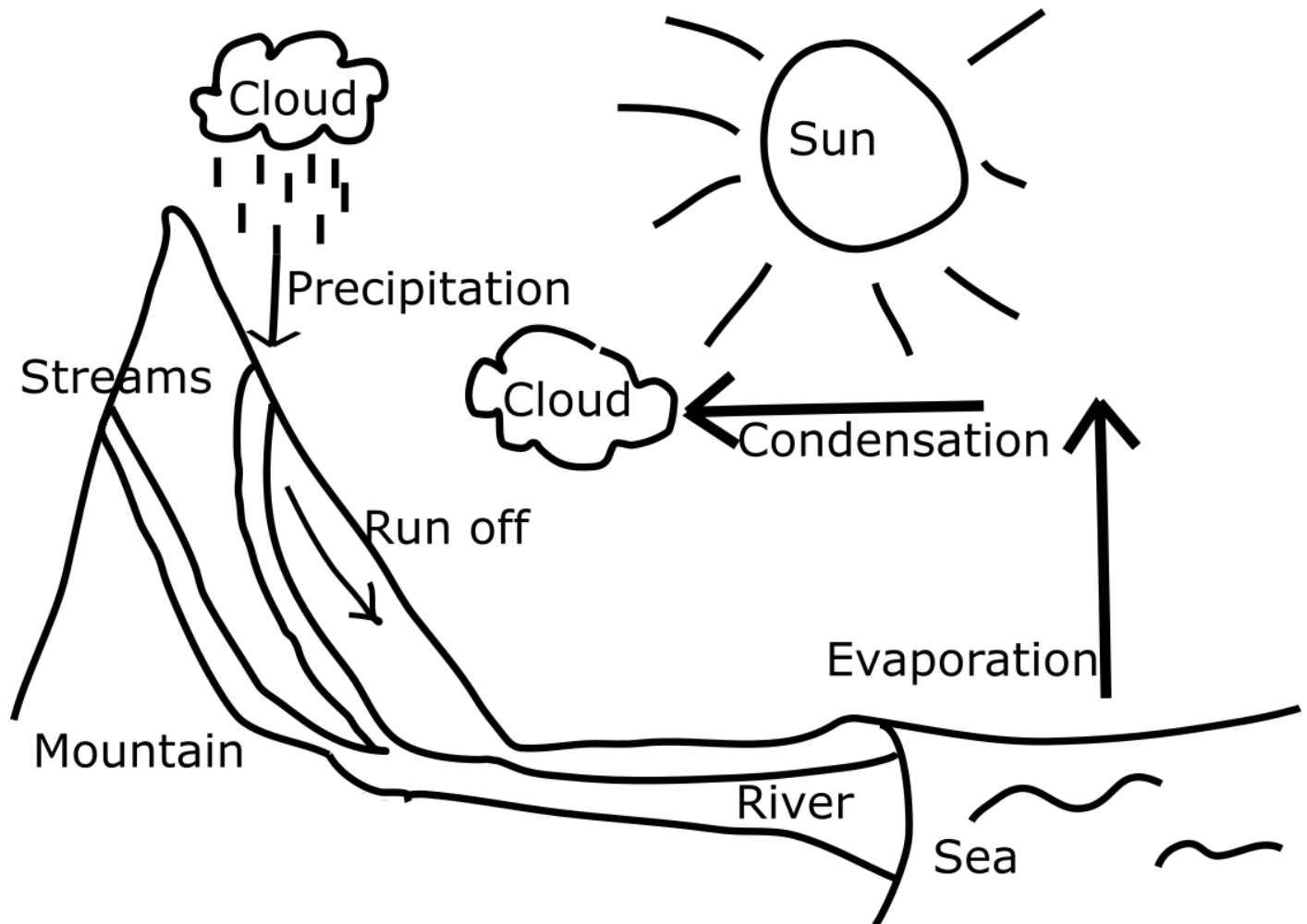
If you have a thermometer, take the temperature of various things: ice, water, your mouth, a hot cup of tea. The Celsius scale that we usually use for measuring temperature was based on the temperatures at which water changed state. So water freezes at 0° and boils at 100°.

People are usually 37°, which is about the melting point of chocolate - see what happens if you put solid chocolate in your mouth!

The Water Cycle

Equipment:
This book,
Counters

- 1) There's water all over the Earth, not just in oceans and rivers, but also in rain, underground, and even inside animals and plants. Have a look at the diagram below and see if you can spot all the places where water is.
- 2) This is a diagram of the water cycle. It shows how water moves around the Earth. Have a look together, and have a go at reading all the words.



- 3) Take a counter and move it around the water cycle - following the arrows - to tell the story of a water droplet.

Extension

You can observe evaporation happening by leaving some water out and checking on it every hour or so. Try putting two tablespoons of water in a cup and on a plate - which one evaporates first?

You can also try leaving out two damp cloths, one flat and one balled up. Which one dries quickest?

Liquids evaporate quicker when they have a greater surface area - if more water molecules are on the top of the water, then more of them will be able to turn into water vapour.

Guess Who

Equipment:

Geometric shapes,

World map,

Body sheet,

Wooden animals,

Counters

- 1) One player should choose a geometric shape the other should choose a wooden animal. Both of you hide your selection under the map or the sheet.
- 2) Take it in turns to ask questions with a yes or no answer, and try to guess which shape or animal your partner has hidden; for example 'does it have any curved edges?' or 'can it fly?'
- 3) When you have both guessed right, swap places so that the one who hid a shape now hides an animal and vice versa.
- 4) Guess Who - Body: Take it in turns to hold this book or the body sheet. The person holding the books should put a counter on one of the body parts drawn below. The other person can ask questions with a yes or no answer, and try to guess which body part they are thinking of, for example 'it is used to breathe' or 'is it part of the digestive system'?

Extension

Try drawing your chosen animal, shape, or body part instead, and let your partner try to guess which one you've chosen from your drawing.

Sound

Equipment:

Mini glockenspiel,

World map

- 1) Hit the bars with the mallet, what happens? What can you hear? What can you see?
- 2) Try hitting the bars when the glockenspiel is on the table, when it is on top of the world map and when you are holding it. Does it sound different?
- 3) Hold the longest bar still with one finger and hit the bar with the mallet. Does it still make a noise?
- 4) The glockenspiel makes a noise when the metal bar vibrates - shakes - causing air molecules around it to vibrate and carry the sound to your ear, where they make small bones vibrate, which your brain interprets as sound. How far away does the sound travel? Take it in turns to play a note repeatedly on the glockenspiel while your partner walks away. How far away can you hear it?
- 5) The bars of the glockenspiel are different lengths. Can you tell which one sounds highest: the longest or the shortest?

Extension

When your glockenspiel makes a noise, it's because the metal bars are vibrating. Can you find out what vibrates to make various other noises? If you have other instruments, you could try those. You could blow over the top of a bottle, what's vibrating there? Hit the top of an empty box, what's vibrating there? Fill a bottle with rice and shake it, what vibrates to make the sound? Can you find out what vibrates when you talk or sing?

Electricity One

Equipment:

Bulb,

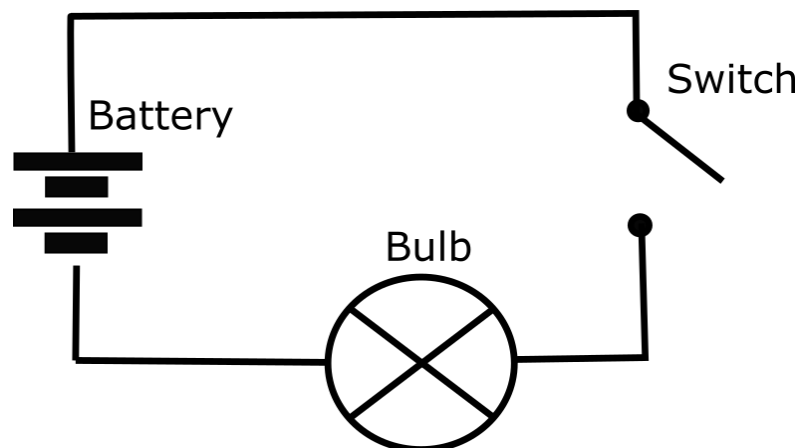
Bulb holder,

Battery pack,

Wires,

Screwdriver

- 1) You will need two AA batteries to complete this activity. Get them and put them in the battery holder.
- 2) Make sure the battery holder's switch is off.
- 3) Screw the bulb into the bulb holder.
- 4) Use your screwdriver to attach the red wire from the battery holder to one side of the bulb holder.
- 5) Turn the battery holder switch on. Does the bulb light up? Do you know why?
- 6) Electricity only flows in a complete circuit. Turn off the battery holder's switch.
- 7) Now, with the red wire still attached to one side of the bulb holder, use your screwdriver to attach the black wire to the other side of the bulb holder.
- 8) Turn the battery holder switch on. Does the bulb light up now?
- 9) What happens to the bulb when you turn the switch off again? Switches make a break in the circuit, just like the break you made when you didn't attach the black wire.
- 10) Here's a circuit diagram of the circuit we just made. Can you copy it?



Extension

If you have some foil, you can make a steady hand game. Start with the circuit we used above. Then detach the black wire from the bulb holder. Attach one of the loose wires to the bulb holder. Now roll a piece of foil into a tight cylinder, carefully attach the black wire from the battery holder to one end of the foil cylinder. Take another piece of foil, roll it into a cylinder, then twist it so that you have a loop on the end of a rod. Attach the loose wire from the bulb holder to the end of the foil rod. Switch on the battery. Now, try to slide the loop on your rod over the foil cylinder attached to the battery without touching the bits of foil together. If the foil touches, the bulb should light up. You can make the game trickier or easier by adjusting the size of the loop and making the foil cylinder more or less wiggly.

Remember electricity only flows in a complete circuit, if either of the wires loose contact with the foil, your game will stop working.

Mixing and Separating

Equipment:

Counters

- 1) Read the piece of writing below, find all the conditional verbs (could, would, can, can't) and put a red counter on them.
- 2) Put a blue counter on all the verbs in the past tense, a green counter on all the verbs in the present tense and a yellow counter on all the verbs in the future tense.

There are lots of fun experiments that you can do with water and a few common household items.

Mix some salt in water and it will dissolve and make a salt solution. This is a reversible change, because if you heat up the salt water, you can separate the salt out again by boiling off the water.

If you had mixed flour into water, it wouldn't have dissolved, so you would have had a mixture instead. You could have separated the flour from the water by filtering it through a piece of filter paper. So mixing flour with water is also a reversible change. Burning is an irreversible change, since you can't undo it. The wax has melted and been vaporized. It has become a gas and dispersed into the air. Scented candles leave a pleasant smell behind.

Mixing bicarbonate of soda and vinegar is also an irreversible change. The two substances will fizz, forming bubbles of carbon dioxide. You can't easily separate the vinegar from the bicarbonate of soda again after the reaction has occurred.

Bicarbonate of soda is a base and vinegar is an acid, that's why they reacted together. Take a quarter of a red cabbage and soak it in hot water for an hour. Take out the cabbage and divide the water into three cups. Mix some bicarbonate of soda into one of the cups of cabbage water. Mix some vinegar into another of the cups of cabbage water. Leave the other cup untouched. Compare the colours of the three solutions. Red cabbage water is a natural indicator - it changes colour when it has been mixed with acids or bases.

Extension

Try out all the experiments listed above.

Black tea - made from any tea bag, the type doesn't matter - is another natural indicator.

Levers and Inclined Planes

Equipment:

Ruler,

Geometric shapes

- 1) Levers are an example of a simple machine. We can make a lever the ruler and the largest of the triangular prisms. Put the triangular prism in the middle of the table - this is your fulcrum.
- 2) Lay the ruler on top of the triangular prism and balance the largest cylinder on one end of the ruler.
- 3) Using only one finger, push down on the other end of the ruler to lift the cylinder.
- 4) Slide the ruler along the fulcrum so that most of the ruler is on the same side as the cylinder and there is only a tiny bit for you to press down on. Can you still lift the cylinder with one finger (be careful not to push so hard that the ruler snaps)?
- 5) Now slide the ruler back the other way so that most of it is on the same side of the fulcrum as your finger is. Press down again. It's much easier to lift the cylinder now! This is how levers work, they allow you to exert a small force over a big distance to move a great weight.
- 6) Inclined Planes are another simple machine. We can make one of those too. Prop the ruler against the prism so that it stays up without you holding it. Put the cylinder at the top of the slope and give it a slight push, watch how far it goes.
- 7) Now push the cylinder with the same slight push on the flat table. It doesn't go as far. Inclined Planes allow us to use gravity to give our pushes more force.

Extension

There are four other simple machines: wheel and axle, gears, wedge and screw.

If you have lego you could make a toy car and give it a push. Then take all the wheels off and push it again. The wheel dramatically decreases the friction of the vehicle, making it go much further with the same strength of push.

Gravity and Air Resistance

Equipment:

World map,

Time snail

- 1) Crumple the Time Snail into a ball.
- 2) Hold the Time Snail as high as you can and drop it on the floor. Watch how it falls.
- 3) Now take the world map and hold it as flat as you can and drop it from the same height. Does it fall differently?
- 4) One of you should drop the Time Snail and one the world map. Drop them from the same height at the same time and see which hits the ground first.
- 5) Gravity has the same effect on the Time Snail as the world map, but the one with the bigger surface area meets the most air resistance, which slows it down the most. Which had the greatest surface area when you dropped them?
- 6) Swap the two cloths around, and repeat the experiment with the Time Snail flat and the world map crumpled into a ball. Which falls quickest this time?

Extension

Get some pieces of A4 paper. Drop one crumpled in a ball and one as a flat sheet. Now take two more sheets. Cut one large hole in the middle of one sheet and lots of small holes throughout the other sheet. Drop these sheets. How do the holes affect the speed at which they fall?

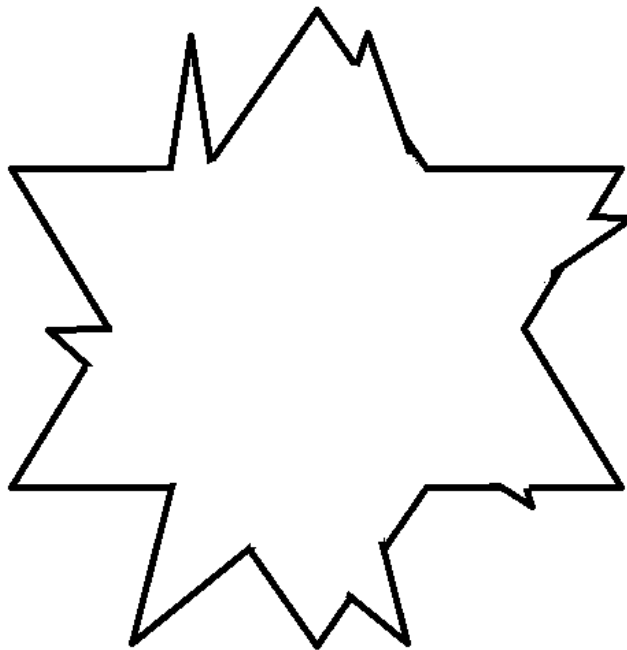
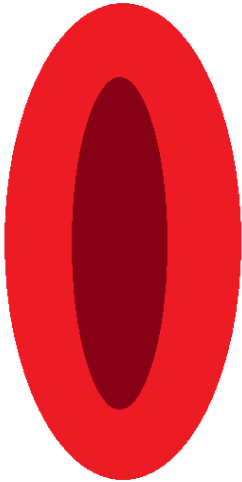
Blood Cells

Equipment:

White board,

White board pen and eraser

- 1) We have three types of blood cells in our blood. Each has their own job to do. Copy the three drawings of blood cells onto your board:



- 2) Red cells carry oxygen. Can you give the red blood cell a big bag to carry?
- 3) White cells fight off viruses. Can you give the white blood cell a sword and shield?
- 4) Platelets make scabs. Can you give this platelet a trowel?

Extension

You can make an edible model of blood by mixing small red sweets with big white marshmallows. Break up about half of the red sweets to make the platelets. In your body, there's an equal volume of platelets and red blood cells. But, there's only about one white blood cell for every seven hundred red blood cells - so you don't need a lot of marshmallows!

Your blood also contains plasma (equal in volume to the red blood cells), which is the liquid that all the other cells float in.

Electricity - Two

Equipment:

Bulbs,

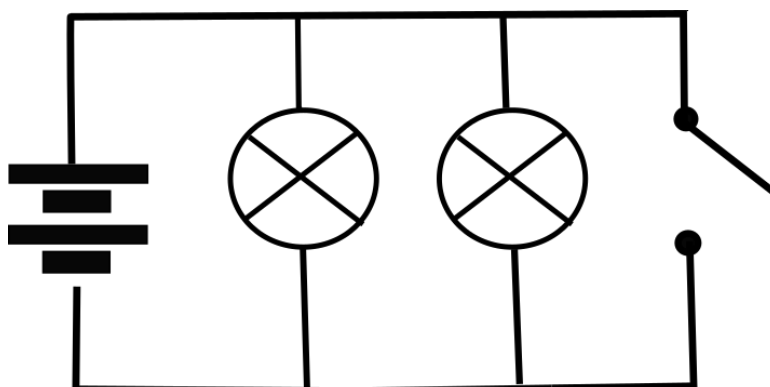
Bulb holders,

Battery holder,

Wires,

Screwdriver.

- 1) Put two AA batteries in the battery holder and turn the switch off.
- 2) Screw the bulbs into the bulb holders.
- 3) Connect the red wire of the battery holder to one end of one bulb and the black wire of the battery holder to the other end of bulb.
- 4) Turn on the switch and look at the bulb.
- 5) Turn off the switch again and disconnect the black wire from the bulb.
- 6) Take the other bulb and connect two bulbs together in a line, with one of the loose wires.
- 7) Connect the black wire of the battery holder to the free end of the second bulb.
- 8) Turn on the switch and look at the bulbs. Are they as bright as one was on its own?
- 9) You have connected the bulbs in series. Can you draw a circuit diagram for the circuit you have made? (Hint - look back at Electricity - One to see a circuit diagram for a single bulb.)
- 10) Now we're going to try and connect the bulbs in parallel. Can you work out how to do it from the circuit diagram? Here it is:



- 11) If you need a few pointers: connect a single bulb to the battery. Then connect the second bulb to



that bulb, using two loose wires.

Extension:

With some paper and some foil you can make your own push switch. Take two paper strips and lay one on top of the other to make a right angle. Fold the strips over each other until you have made a paper spring. Stick a rectangle of foil to the top of your paper spring, so that its edges hang over the sides. Take two more pieces of foil and lay them on the table. As you press down your push switch, the foil needs to meet to complete the circuit.

The symbol for a push switch looks like this:

