Exploring and measuring

IMPORTANT Parent or Carer –
Check that you are happy with any weblinks or use of the internet.

NB New activities are being added at the **top** of each document.

Activity 8 – Investigating and testing

Carry out a bird survey

What to do

- Talk about the different birds you can see from your window or in your garden. Do you know what type of birds you often see?
- Look at the reference material and talk about birds common to your area. How can you recognise them? Explore the different colours and markings.
- Which one do you think visits your garden the most? How could you find out? *Carry out a survey.*
- Create a tally chart on a piece of paper with 4-6 named/drawn birds you are most likely to see.
- Sit quietly and count the birds which visit. Identify the type and draw a line for each to make a tally.

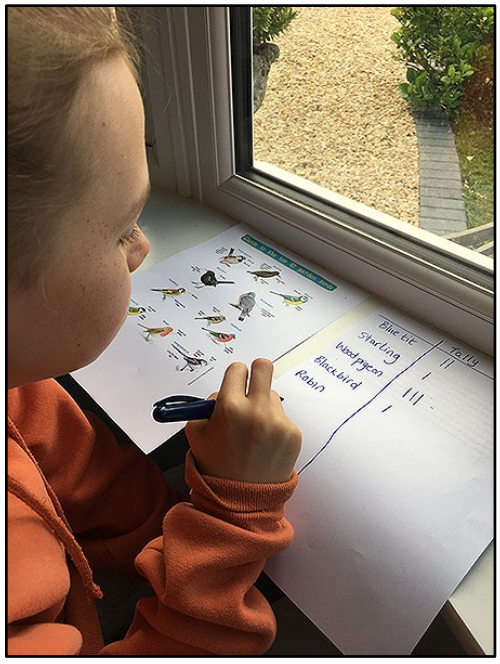
What you need

Paper and a pencil

A garden bird identification poster/book ***or***

Print a guide from the internet, such as:

https://cdn.shopify.com/s/files/1/1538/3241/articles/garden-birds-identification.jpg?v=1517000716



Extension

Talk about ways to encourage feathered visitors. Consider providing food or a bird bath:

https://www.bbc.co.uk/cbbc/thingstodo/p00lx9r9

Find out more about UK birds with:

https://www.bbc.co.uk/cbeebies/joinin/garden-bird-spotting

Questions to ask

What types of birds do we often see outside?
Do we know their names?
Can we recognise a blackbird, robin or pigeon?
What type of bird visits us most? How could we find out?
When are we most likely to see birds?
How can we draw a tally? Can you count how many sparrows we saw?
Which type of bird was the most common?

Activity 7 – Investigating and testing

Carry out a 'Puff Test'

What to do

- Share the story of *The Three Little Pigs*, telling it from memory or playing: http://player.hamilton-trust.org.uk/story_telling_display.php?cid=225
- Remind children how the wolf huffed and puffed. Discuss what sort of things can be easily moved/are hard to move by the wind.
- Explain that we can test some things to see how easily they can be moved by blowing.
- Collect a range of objects together and predict which ones will be moved by a puff and which will not. What clues can we use to help us predict?
- Test these together using a pump or by blowing through a straw and put into the correct tray.

What you need

Things to test

This could include straw, twigs, bricks/blocks, feathers, paper (scrunched up & flat), toys, straws, any other interesting objects

2 trays, baskets to sort into

Optional – balloon pump or drinking straws

Optional – labels to print (*see below*)

Extension

Talk about things that the puff-able and not puff-able objects have in common.

Test natural and found objects.

Record finding by photographing, or drawing or listing the two group in a table.

Questions to ask

What happens in the story? Which houses blow down and which stays upright? What different materials do the pigs use?

What things can be moved by a puff? How could we test this prediction?

What makes things easy to move by blowing? Can we make paper easier or more difficult to move? How?

Optional Sorting Labels

Can be puffed

Cannot be puffed

Activity 6 – Researching and sharing

Give an expert report

What to do

- Follow your child's interests – *dinosaurs, unicorns, a team, a sport or a collectable toy,* etc.
- Pick someone who needs an 'expert' to tell them all about it, e.g. *'Grandma was asking me the other day about Twisty Pets. She didn't know what they were.'*
- Discuss what information you could give your audience and if you need to check some facts – use books, the internet and/or factual programmes.
- Prepare a talk together (in the style of show and tell) where your child talks about their topic, showing objects or pictures.
- Give the report in person, over social media or by videoing and sending.

What you need

A topic of interest

An audience

Ways to check facts – internet, books, etc.

Printed pictures or objects to show

Extension

Make a poster or booklet together to share the key facts. Draw some pictures and add labels.

Create a quiz to test your audience.

Look at non-fiction books and find out about other topics.

Questions to ask

What do you know about unicorns?

What do you need to explain to Grandad?

How can we find out how many types of frog there are?

What picture would help show what a stegosaurus looks like?

Activity 5 – Solving a problem by testing

Testing objects for floating and sinking.

Adult supervision is essential for water activities

What to do

- Tell a story which presents a problem to be solved: explain that you are looking for some good things to use as bath toys but you want them to float so that you won't have to hunt round for them under the bubbles.
- Explain that you are not sure which things will float and which will sink – we will have to test them.
- Go around the house collecting a selection of likely & less likely items.
- Before testing, talk about each object and sort according to your child's prediction. Which will sink? Which will float?
- Test the predictions, one at a time. If you have a transparent container, you look through the side and easily see which floats and which sank.
- Record your findings by drawing, listing or creating a table.

What you need

Lots of objects to test – you can collect these together (e.g. *wooden, plastic and metal spoons, marble, pencil, cork, rubber, coin, plastic, metal and wooden toys, etc)*

A water filled container – transparent is best for careful observation

Extension

Talk about why your child thinks some objects floated and some sank.

Provide some of the tested objects as toys next bath time.

Make a poster to share your findings.

Questions to ask

What happens when an object floats?

How can we tell if something has sunk?

What materials are bath toys made of?

Do you think this will float? Why?

What sort of things float?

How can we test our predictions?

How can we remember what floated and what sank?

Activity 4 – Measuring using informal units

Who can jump the furthest?

What to do

- Warm up with some jumping. Agree that we can jump up high, but we can also jump across (like if we had to jump over a puddle).
- Ask who can jump the furthest in your home. Is there a way we could measure our jumps?
- Create a fixed starting point and a way of recording where people land (this could be a toy, a chalk mark or a coin).
- Have some practice jumps and then take turns to jump, record the landing point and measure by placing a shoe as many times as it takes to cover that distance. You are measuring in shoes.

What you need

A shoe

A way of marking a start and end point:

Outside – chalk, cone, tape

Inside – toy, ribbon, cone

Extension

Help your child to create a table to record everyone's jumping distance.

Challenge your child to increase their distance.

Use the internet to find out the jumping distance of other animals – mark out the distance using your shoe.

Questions to ask

Who do you think can jump the furthest?

How can we find out?

How can we measure the distance?

What if we used different shoes for each person?

How can we record/remember how far each person has jumped?

Activity 3 – Explore colour mixing

Create a colour mixing picture

What to do

- Talk about the different colour paints that you have – what colours do you have? Squeeze them out onto a palate or plate in coloured blobs.
- Say it is a shame that you don't have any other colours. Does your child know how we could get some different colours? By mixing.
- Help your child mix two colours at a time, predicting what the colour will be before you mix and then discussing what the result is.
- Create addition type sentences to show what happens when you mix each two colours. You could draw

  ◯ + ◯ = ◯

  three times and your child can record their findings in the shapes, i.e. red+yellow=orange.

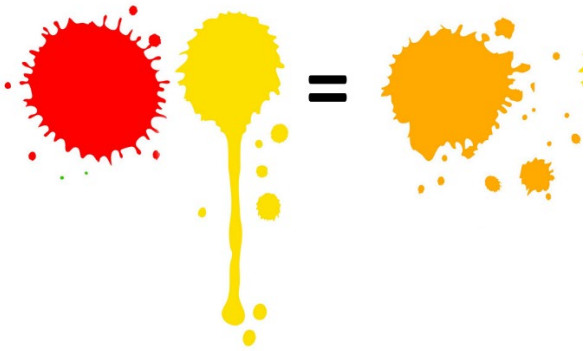
What you need

Ready mixed paint – yellow, blue and red (primary colours)

A paint pallet or small plates for paint mixing

Paint brushes

paper



Extension

Use the mixed colours to make a colourful picture – you could make a butterfly by painting one side and folding the paper to print the other

Share your findings so your friends can make lots of new colours

Try mixing the secondary colours together (green, orange and purple) to see what colours you get

Questions to ask

How could we get different colours?

What happens when we mix two colours together?

What colour will we make if we mix red and yellow?

What happens if we add more of one colour?

Can we write a rule, so we remember how to make green?

Activity 2 – Sorting objects by criteria

Sorting toys by the material they are made from

What to do

- Set up the challenge – can we find out how which materials are most commonly used in toys?
- Gather together some toys and discuss the type of materials they are made from (*wood, plastic, metal, fabric,* etc.)
- Encourage your child to sort them by material. If you come across an object which is made of more than one, encourage your child to think of a solution (i.e. *have a 'mixed' group*).
- Check each group to see that all the items fit the criteria and count them. Compare the numbers to answer the question.

What you need

Toys of different materials, e.g. plastic ball, metal car, cuddly toy, wooden train
Paper and a pencil

Extension

Make a record of your findings by writing each material and writing the number next to it.
Find out which material is most and least common by comparing the number in each group.
Think about why some materials are used more for toys.
Sing along with Maddie Moate's materials songs:
https://www.youtube.com/watch?v=ys-IR2KGeoY
https://www.youtube.com/watch?v=WqKrGbPORfs

Questions to ask

How can we tell which materials these toys are made from?
How can we group the toys to help us find out which material is most common?
What materials make good toys? What materials do we not usually make toys from? Why?

Activity 1 – Measuring using informal units

Find out how much your hand is worth

What to do

- Set up the challenge – can we find out how much your hand is worth?
- Help your child to draw around their hand and then measure it by placing a coin and drawing around it as many times as it takes to create a line from top to bottom – *this will be tricky so give lots of help and encouragement*.
- How many coins did it take? Count in 2s to reach an amount and help your child to record the number on their hand shape, with a *£* or *p.*

What you need

A coin: 2p or £2 piece (you can choose other coins, but these are easiest to draw around and count)

scrap paper and a pen or pencil

Extension

Find out the worth of each person in the home's hands – create a display of hands with the worth recorded.

Place the hands in order, highest to lowest.

Try with a different coin – 10p and counting in 10s.

Can we do the same with feet?

Questions to ask

How many times did you draw around the coin?

Can we count in 2s?

How much is your hand worth? (in pence or pounds)

Do you think my hand will be worth more or less than your hand? Why?

Whose hand will be worth the most/least? How can we find out?

Numbers and Shapes

IMPORTANT Parent or Carer –
Check that you are happy with any weblinks or use of the internet.

NB New activities are being added at the **top** of each document.

Activity 8 – Counting and number recognition

Put number leaves in order and compare them

What to do

- Write numbers 1-20 (or 10) on leaves so you end up with number cards. Ask your child to help you remember the numbers as you write them.
- Ask them to help you put the leaves in order, starting with '1', in a line.
- Play games like:
  - flip over a few leaves (while in their ordered line) and ask your child what the hidden numbers are.
  - Choose two leaves at random, asking which is the higher/lower number. Check by counting to see which comes first.
  - Choose a leaf each. Who has the higher number and has won?
  - Put down two numbers. Can your child say which number would go in the middle? e.g. *6, __, 8*
  - Put down a leaf. Can your child find the leaf which shows one more and one less?

What you need

Flat leaves, a marker pen

Extension

Place a leaf on a sheet of plain paper. Can your child draw spots which match the number?
Hide the leaves for your child to find and then put in order.
Lay out the leaves randomly. How quickly can your child find a…*3*…*9*…etc.?

Questions to ask

What number should I write first? What comes next?
Can we put them in order, starting with the lowest number? What will the last number in my line be?
Can we say the numbers in order?
Which number is missing?
Who has the higher/lower number?

Activity 7 – Exploring and recognising shapes

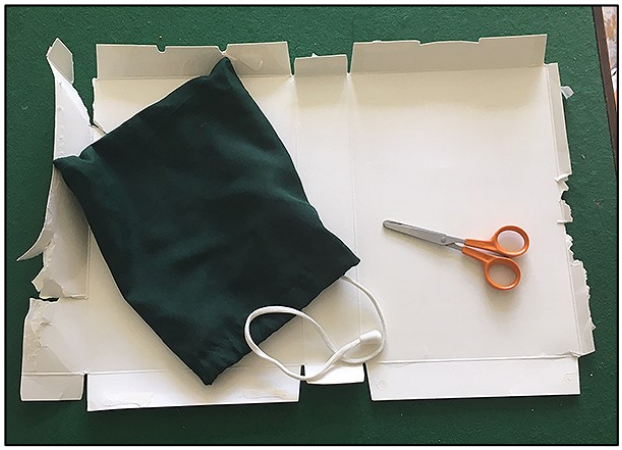
Play shape peekaboo

What to do

- Cut out different sized shapes from card. Include a few different:
  - circles
  - squares
  - rectangles
  - triangles
  - (hexagons & octagons)
- Place these all in a bag.
- Explain that you have hidden some 2D (flat) shapes in your bag. Ask your child what they might be.
- Take one shape at a time and make it 'peep' out from the bag. Can your child guess the shape from the part they can see? Show different parts of the same shape talking about what is peeping out, e.g. *'One point, another point, one more point. Hmm. Three points. What must that shape be?'*
- Each correct guess wins your child the shape. Continue until your child has won all of the shapes.

What you need

Card - could be from packaging
Scissors, a bag to hide the shapes



Extension

Play the game with you as the guesser.
Play the game by feeling the shapes rather than peeping at them.

Questions to ask

What shapes might I have in my bag?
How many sides/points does that shape have?
What clues do we have so far?

Activity 6 – Counting and using number facts

Work out a missing number

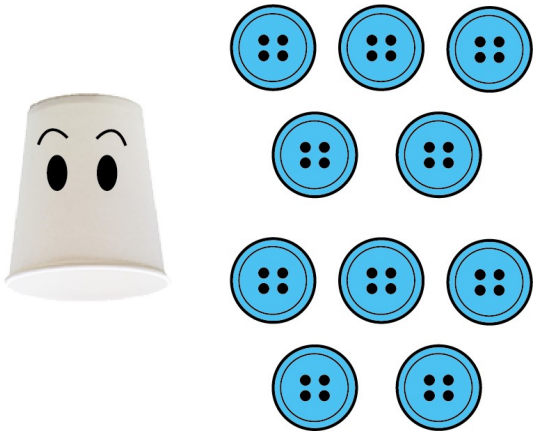
What to do

- Start with 5 counters on a surface. Count them together. Explain that the cup is going to catch some counters and the only way to free them is to say how many are under the cup.
- Make a game of the cup hovering over and then 'catching' some counters. Can your child work out how many have been caught underneath using the number of counters remaining?
  - *They may use number facts (3 still free, 3+2=5 so 2 caught), counting on with fingers (3 free, so 4…5…= 2 under the cup) or guessing.*
- Repeat the game. Your child may become more strategic in their working out as they play, or you can reduce the number of counters to help them.
- You can repeat this game, changing the number of counters in play.

What you need

A cup (optional eyes drawn on)

5-10 counters (*cereal shapes, buttons, coins*, etc.)



Extension

Perform the trick together in front of an audience but tell them you are using 'magic'. You could cover the counters with a magic hat (paper rolled in a cone with stars drawn on it) and see if you and your child can hoodwink the audience using magical maths.

Use this principle with small animals or people and a box for a building. How many people are in the house/animals in the barn?

Reverse roles and get your child to test you.

Questions to ask

How many counters are there?

What if the cup trapped one? How many would still be free?

There are 5 Cheerios. *Munch, munch, munch.* Now there are two left. How many has the cup eaten?

Can we count on to find how many are hidden?

If there are 4 still free then how many are under the cup?

Activity 5 – Counting and using number facts

Play with number bond egg puzzles

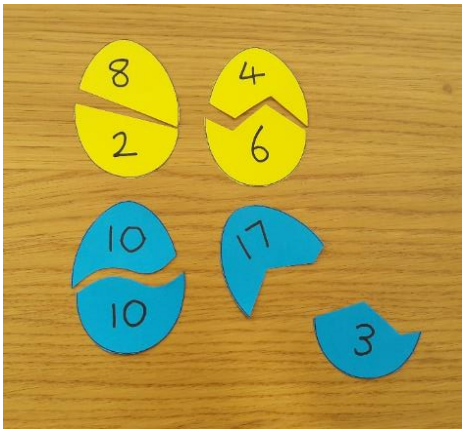
What to do

- Start with number bonds to make 10. *These are pairs of numbers which when added together make ten.*
- Print the egg shapes (or draw some) on card. Cut each egg in half to make a different 'crack' design. On the top and bottom of each egg, write a pair of numbers which total 10.
- Your child can then explore matching the egg halves to make the correct number bonds to 10.

Tip: *You don't have to include all possible combinations to start with. Select from the possible pairs and add more when your child seems confident.*

What you need

Card, scissors, thick pen, egg template (*see below*)



Extension

Hide the shell halves to make a treasure hunt game (around the garden/house or in dry cereal).

Make a second set which are not differently cracked – your child can use counting and/or memory of the bonds to match them.

Create a new set (a different colour if possible) with number bonds to make 20.

Questions to ask

Do you know some number bonds to make 10?

Which pair of numbers make 10 when you add them? Can you find the pairs?

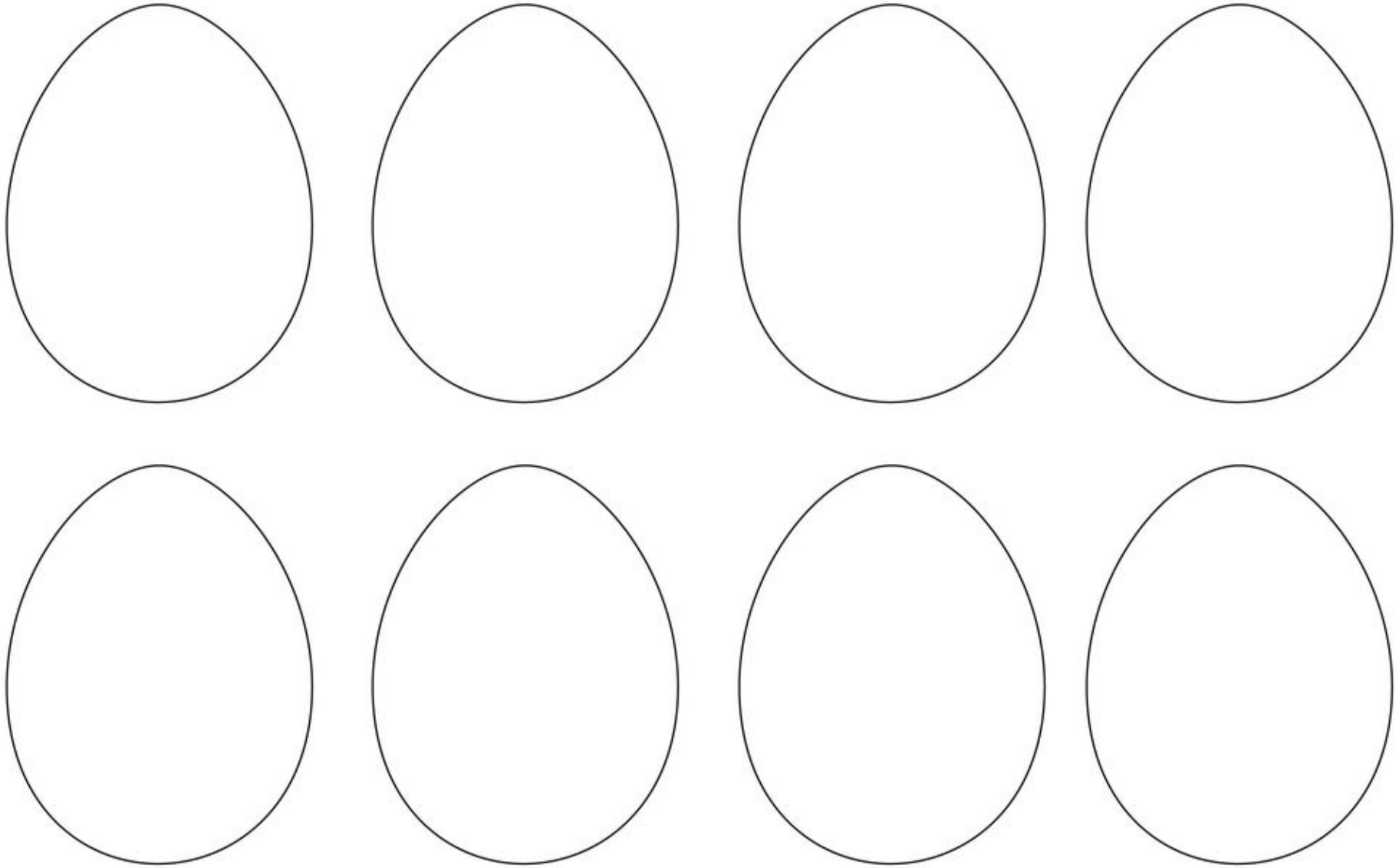
I have 8 here. How many more will I need to count to 10?

Which is the biggest/smallest number?

Number Bonds to 10

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

Number Bonds - Egg Template



Activity 4 – Exploring and recognising shapes

Make a shape picture

What to do

- Make some shape stencils by drawing them on card and cutting them out, e.g. *circle, square, rectangles and triangles of different types.*
- Show your child how to use the stencils to draw their own shapes. They may need support knowing how to hold the stencil still with one hand while drawing around it with the other. *This can be tricky and may require adult help each time.*
- Together cut out the shapes and talk about the different ones you have made.
- Now your child can make some pictures arranging the shapes and sticking them down when they are happy with their position.

What you need

Card, children's scissors, pencil, paper (coloured if possible), paper glue

Extension

Do not provide glue. This can be a reusable activity which just needs a small container to keep the pieces in.

Include a greater range of shapes, e.g. *hexagon, octagon, parallelogram*, but focus talk on describing these shapes' properties rather than learning their names.

Questions to ask

How can we use a stencil?

What shapes do we have stencils for?

How do we know this is a triangle?

How many points does a square have?

Is this a rectangle or a square? How can we tell?

What different patterns/pictures could you make?

What shape did you use for the hat?

Activity 3 – Counting and using number facts

Jumping up and down a number track

What to do

- Draw a number track: a series of boxes or divisions in a line with numbers 1-12 written in order along it (*like hopscotch but only one square thick each time*).
- Jump on each number saying it aloud going forward. Repeat starting on 12 and jumping back.
- Play about, jumping forward and back saying 'add one/takeaway one' 'add two/takeaway two' as you jump forward and back.
- Start just before 1 on the track and flip the plate. The game starts on the first +2. Take turns to flip the plate jumping forward and back the displayed number of places. You win by landing on (or going past) the 12.

What you need

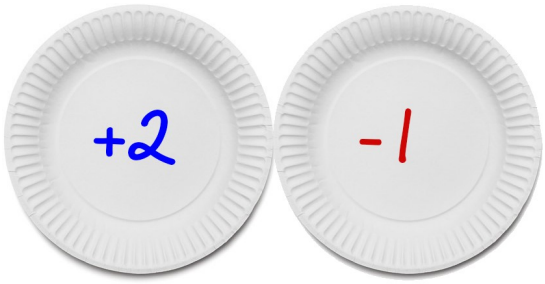
Chalk and a pavement or patio

Or

A large roll of paper and thick pen

and

a paper plate with +2 written on one side and -1 on the other



Extension

Make a game die (cube shape made sticking 6 card squares together). Include *+1, +2, -2, -1* and a couple of comedy actions, e.g. *pat your head and rub your tummy* on the other two squares.

Make a mini version on A4 paper and use counters to make a competitive game.

Questions to ask

I want to write the numbers from one to twelve in order. Can you help me?

Can you jump to one more/less?

Can we add 1/takeaway 1 by jumping?

How many jumps would +2 be?

The plate shows -1. What do we do?

Activity 2 – Counting and number recognition

Create a counted collection

What to do	What you need
○ Show the collecting containers. Read the numbers together. ○ Discuss what sort of things your child could collect in them. Help them to think about what might fit inside and what might not. ○ Set them off collecting, encouraging them to count the objects in carefully. ○ Get them excited by saying that you are really looking forward to seeing what they will collect. ○ Ask your child to share their collection. Check the correct number is present together and admire their haul.	A selection of collecting containers, labelled with numerals written inside: e.g. • *an eggbox with 1,2,3,4,5,6 written, one number in each section* • *6 cupcake cases with numbers on the bottom 2,4,6,8,10,12 placed inside a tin (blu-tak-ed in place)* • *6 flowerpots labelled 10-15* • *A grid drawn in chalk with different numbers written inside the boxes* And things to collect, e.g. *different petals, leaves, grass blades, mini figures, Lego pieces, beads, buttons, hair bands,* etc.
Extension	**Questions to ask**
Display the collection. It could have labels and a sign to introduce it. Change the numbers for a new collection. Encourage your child to write some new numbers, forming each digit carefully*. Change where the collection is made – take it into the garden, into the kitchen, to the toy box, etc.	What are these numbers? Can you say them? Which is the biggest/smallest number? What could we collect 6 of in here? Would 6 fit? How could we check that there are 9 daisies in here? How many more/less do we need?

*If you are not sure about number formation, these rhymes are commonly used in schools:
https://www.youtube.com/watch?v=vjB5aSyWD6U

Activity 1 – Exploring and recognising shapes

Go on a shape hunt

What to do

- Explain that you are going to be going on a shape hunt looking for 2D (flat) shapes.
- Talk about the different shapes that you might see - *this is more a warm-up than to test shape knowledge.*
- Go on the shape hunt, spotting, describing and identifying the shapes that you can see. You could do this on a walk (*pavements, houses and signs have lots of potential for spotting*) or around your home.
- Record the shapes you spot by drawing and/or photographing them.
- Not all the shapes will be traditionally mathematical shapes (*like triangle, square, circle,* etc.). It is fine to have heart, star and moon shapes etc.

What you need

Paper, pencil, and something to lean on…

Or a camera/phone.

Extension

Make a shape book. Draw or use photos and label the shapes.

Talk about the properties – number of sides and points, straight or curved sides.

Play a shape spotting games with Super Numtum: https://www.bbc.co.uk/cbeebies/games/numtums-kingdom-of-fluffy

Questions to ask

What shapes will we see?

How many sides/points does that shape have?

Can we find any circles?

How many triangles have we spotted?

Why is a star shape not a triangle?