EYFS Outdoor Maths Opportunities

For pupils in or working at EYFS level

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Cardinality and Counting

Related ELGs:

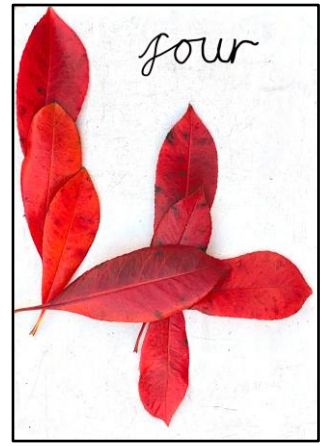
- Children have a deep understanding of numbers to 10, including the composition of each number
- Children can subitise (recognise quantities without counting) up to 5
- Children can verbally count beyond 20, recognising the pattern of the counting system

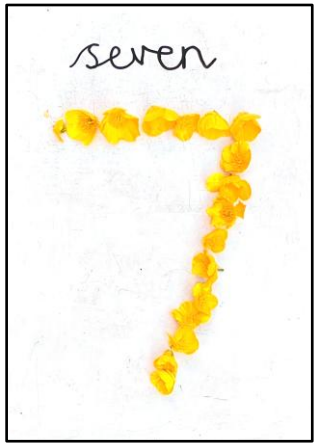
Natural numbers

Specific area: Number

Help pupils to create numbers out of natural objects. You can then take photos of these to display in your classroom or outdoor area.

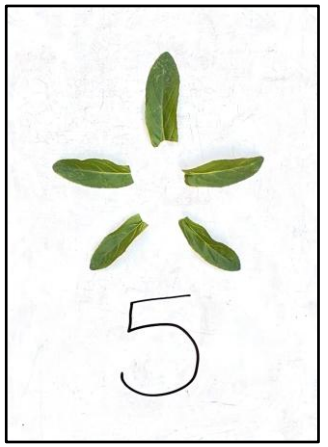






If you have enough of certain objects, you could also create cards to support subitising, with a number of each object relating to the value on each card.







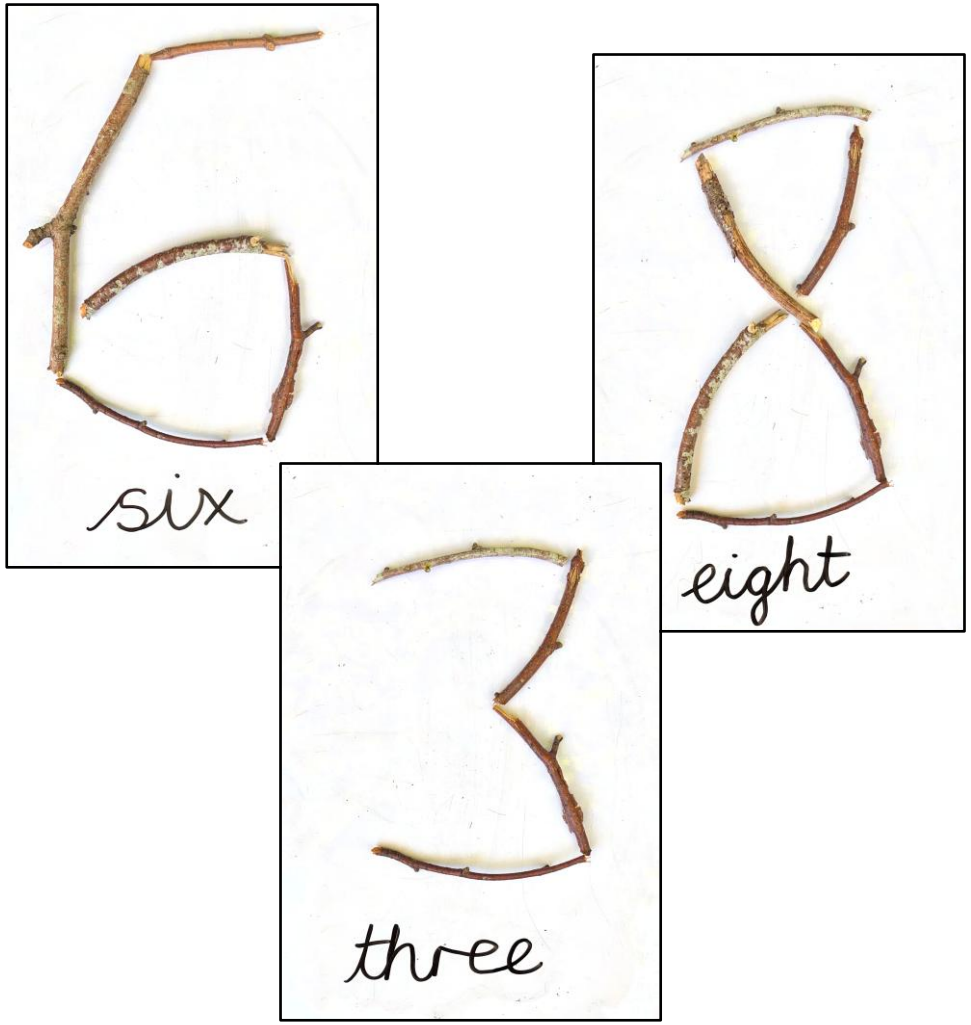
Stick numbers

Specific area: Number

Challenge pupils to make numbers to 10 just using sticks. They could do this individually or in groups.

Discuss afterwards which numbers they found the trickiest to make and why.

Pupils could then count how many sticks they used to make each number. Do they think they could remake each number using the matching number of sticks each time, e.g. could they make the number 5 using five sticks?



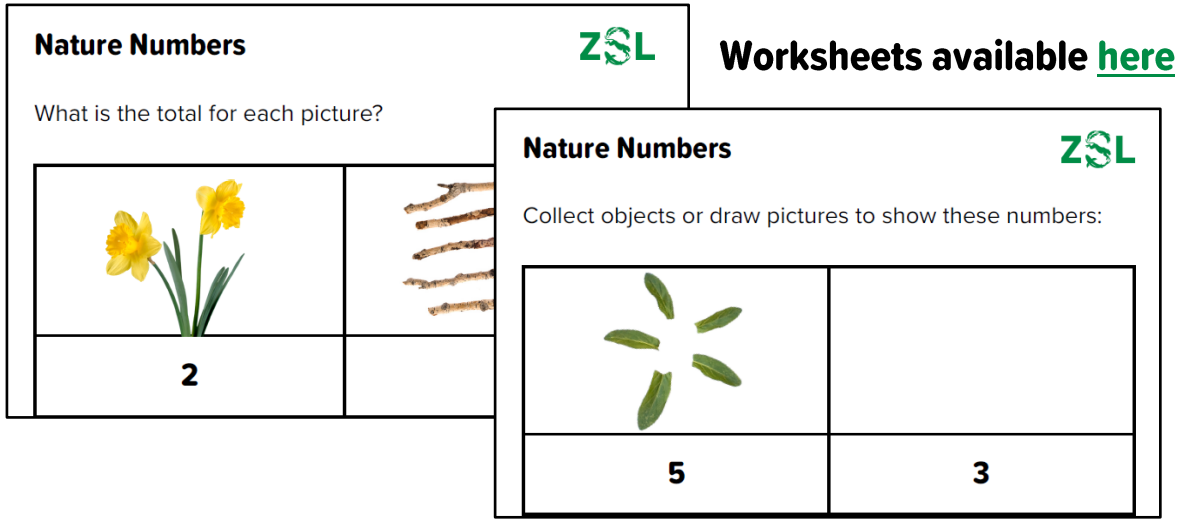
Matching numbers

Specific area: Number

Having a set of stones with numbers on can be useful for many outdoor activities, including tasking pupils with matching the correct number of objects to the number on the stone.



Alternatively, you could provide worksheets (or have them laminated for repeat use in your outdoor area) where pupils both find the totals for a given number of objects and collect or draw images to represent different numbers.



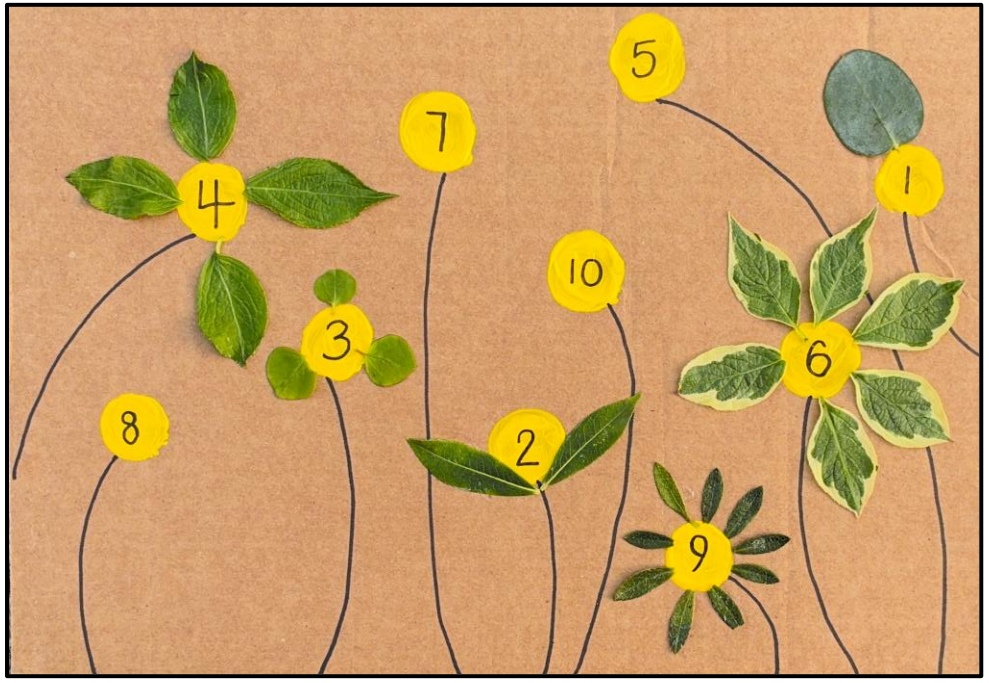
Worksheets available here

Number petals

Specific area: Number

Support pupils' counting with this activity that requires them to attach the correct number of petals/leaves/an object of your choice to a range of empty flowers. Write the number of petals to be attached to each one in the central point.

Pupils can be responsible for collecting their own leaves or choosing appropriate sizes from a selection (e.g. they will need smaller leaves for flowers that require a larger number of petals).



Active numbers

Specific area: Number

Place number cards that your class are confident with and/or are working on in a feely bag.

Ask a pupil to come up and pull out a number card.

They read the number out loud and suggest an action, for example, 5 hops.

Everyone then has to do 5 hops – counting each one out loud to ensure accuracy!

To add an extra challenge and introduce partitioning, you could ask pupils to suggest two actions for everyone to complete. For example, this time 5 could be split between 3 hops and 2 jumps.



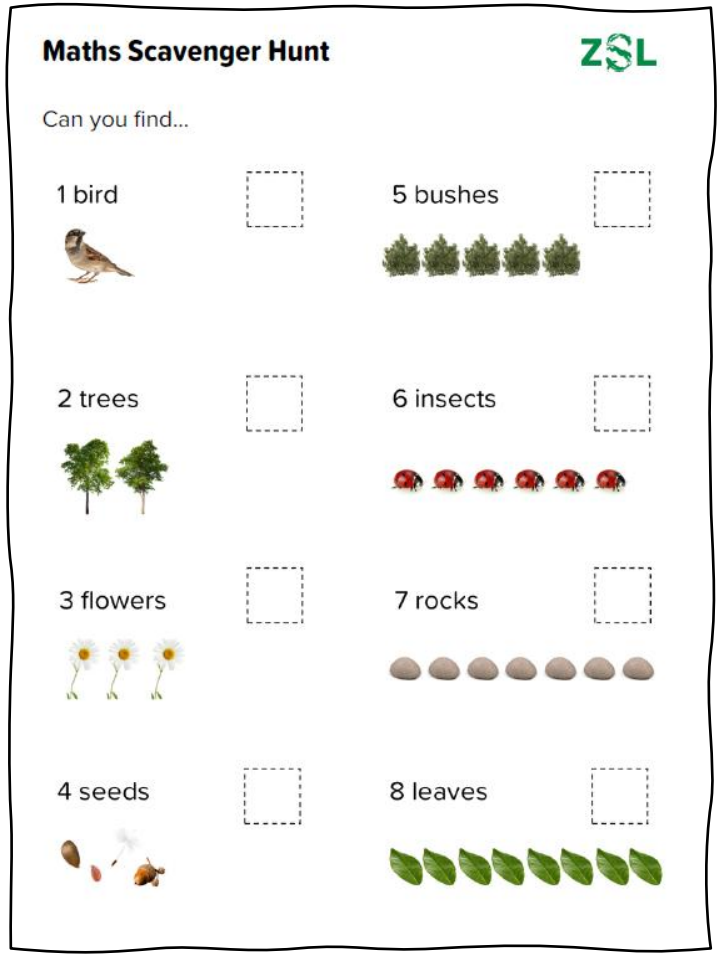
Number scavenger hunt

Specific area: Number

Pupils could collect or scavenge items of their own choice to count, or you could provide specific objects and amounts for them to find (as on the worksheet opposite).

This will help develop 1:1 counting and number recognition.

Worksheet available here



Counting and passing

Specific area: Number

Stand in a circle, as a class. Pass a ball or beanbag around the circle, counting in ones with each pass, up to the number your pupils are confident with. Once you get to this number (e.g. ten), start counting from zero again.



Once your pupils have gained good fluency with counting, challenge them to start from a number that isn't zero. For example, you could start the counting from three and see if pupils can continue the sequence to your chosen end number.

This activity could also be used to practice counting backwards from a given number with each pass.

To incorporate an extra element of physical development, you could get pupils to partner up and pass a large ball between them, counting with each pass. This could be adapted to the different numbers each pair is comfortable with.

Counting bird calls

Specific area: Number

Take pupils outside to listen out for bird calls, providing the opportunity to practice counting things that cannot be seen (as well as promoting nature connectedness).

Get pupils to sit quietly and put up a finger every time they hear a bird call. You could set a timer for 1 or 2 minutes.

If you do this activity more than once, pupils may start to recognise that some of the calls are coming from the same bird.



Mixed natural objects sets

Specific area: Number

Gather a range of natural resources and present them as a mixed set of objects.

Ask pupils to identify the number of specific items in the set, e.g.

“How many stones are there?”

“How many pinecones are there?”

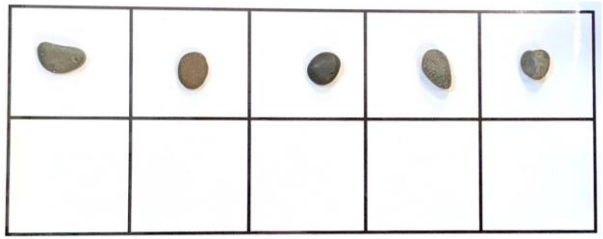
You could also ask how many there is of an object that is not present in the mix to include an appreciation of zero.



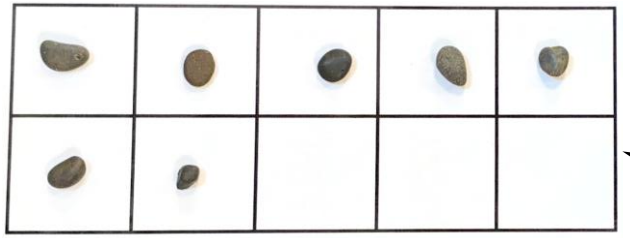
Subitising with tens frames and natural objects

Specific area: Number

Tens frames are a useful way for pupils to count objects and begin to subitise.

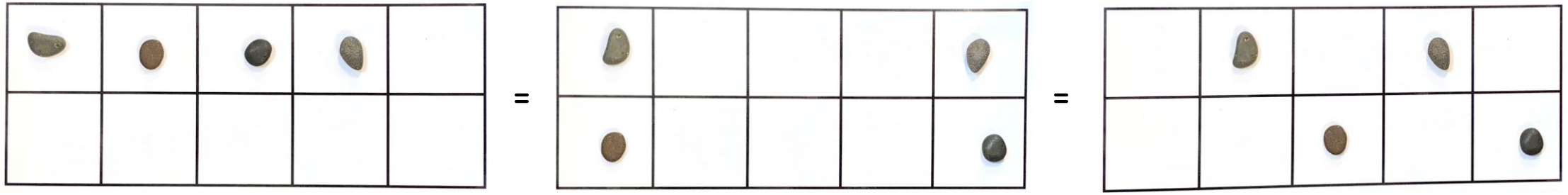


I know this is 5 because the top row is full.



7 is five and two more.

Pupils could also place the same number on the frame in different ways to develop flexible recognition: although it may look different, it is still 4. How do they know?



Comparison

Related ELGs:

- Children can compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity

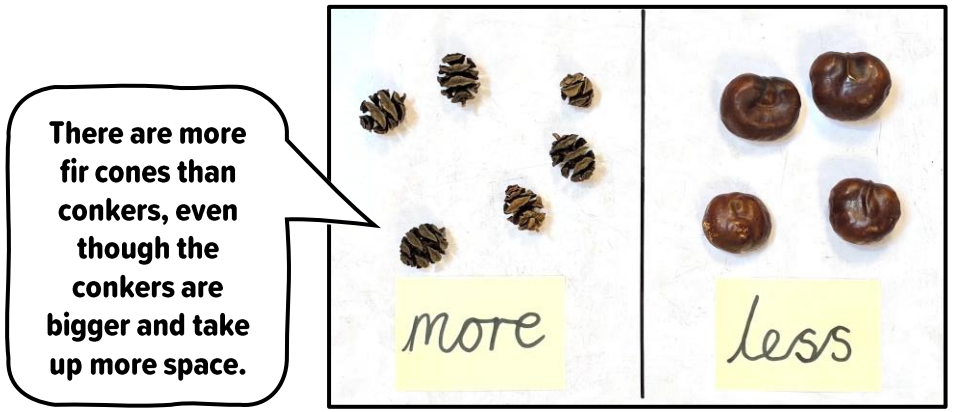
More than/less than

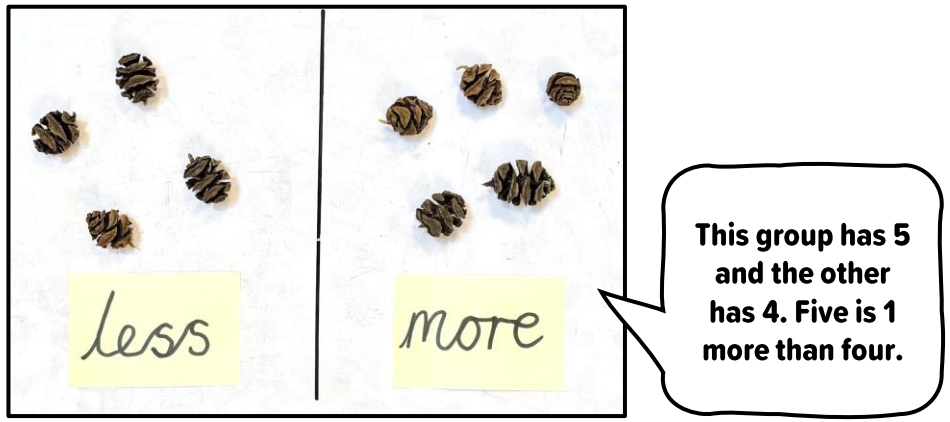
Specific area: Numerical Patterns

Present pupils with collections of different natural objects or ask them to collect their own items and then compare with a partner. Which collection has more things?

Vary the objects in the collections, for example:

- comparing amounts of identical objects;
- comparing amounts of different sized objects, to draw pupils' attention to the number of things and not the size



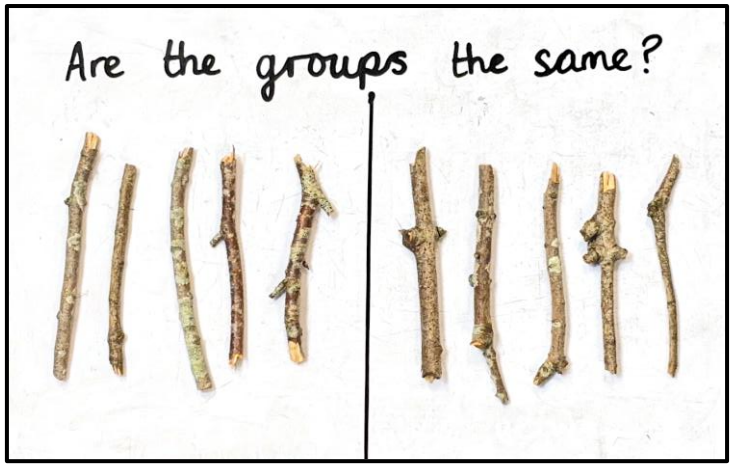


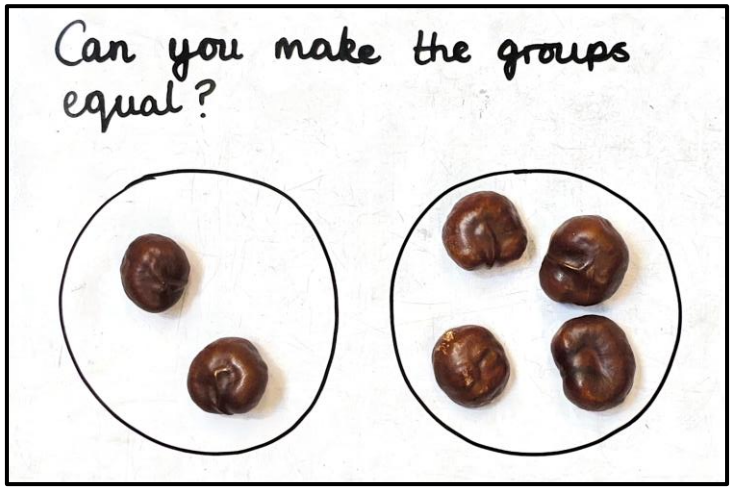
Identifying equal groups

Specific area: Numerical Patterns

Similarly to the previous activity, provide pupils with a collection of objects and ask them to check that the groups are equal. This could be done by matching on a one-to-one basis, perhaps using a tens frame to support this structure.

Give pupils the opportunity to create their own groups of equal amounts, perhaps with a partner. You could also ask pupils to convert two unequal groups into groups with the same number.





One more and one less

Specific area: Numerical Patterns

Working in partners, pupils start with a certain number of natural objects and rehearse adding one more and taking one away. Demonstrate using sentence stems to encourage pupils to orally explain the process.

You could also provide labelled pots/chalked areas/whiteboards for pupils to add the correct number of objects into. Show examples where objects have been incorrectly sorted, e.g.

“This pot says 3 and there are 4 pinecones in it.
What do we need to do?”

“This area is labelled 6 and there are 5 sticks.
What do we need to do?”

Pupils should identify that we need to take one out or add one in to make the correct total.





Composition

Related ELGs:

- Children can automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts
- Children explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally

Making 5

Specific area: Number

Ask pupils to gather five natural objects (these could be the same five objects or different).

Encourage them to explore how many arrangements they can make with their five objects, to see the different ways that ‘five’ can be and look.

You could also do this with ten – can pupils see different arrangements within the whole? (e.g. have they made two groups of 5, etc.)















Number tracks

Specific area: Number

Draw number tracks/lines (both horizontal and vertical) that pupils can jump along.

They can use this to practice counting up from zero and also to add and subtract from different starting points.

For example, you could ask a pupil to start at 3 and make two jumps. Where have they landed?

Tell the story using first, then and now: "**First** I was on number 3, **then** I made 2 jumps, **now** I am on number 5." This means that 3 plus 2 more equals 5.





Investigating different groupings

Specific area: Numerical Patterns

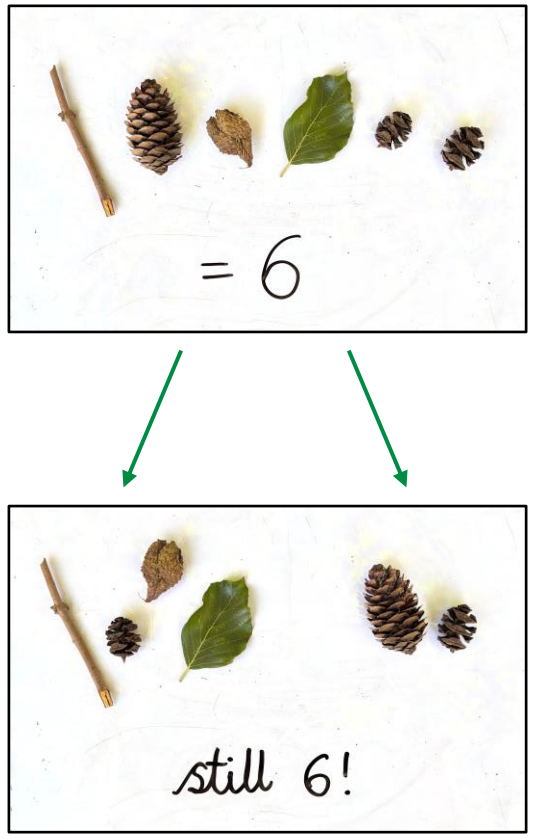
For whichever number your class are currently focusing on, have pupils collect that number of objects from your outdoor area. The items do not all have to be the same.

Once everyone has their own collection, sit together and practice one-to-one counting out loud to ensure everyone has the same number.

Model splitting your collection into two smaller groups, then ask pupils to do the same. For example, if you have all collected 6 items, you could split these into a group of four and a group of two.

Have you all still got 6 items? How many are in each group? Model bringing everything back together and recounting to prove you still have six.

Challenge pupils to find their own methods of splitting their collections into two smaller groups. How many ways can they find? Some pupils might start to investigate splitting into more than two groups. Draw the others' attention to this and encourage them to experiment similarly.



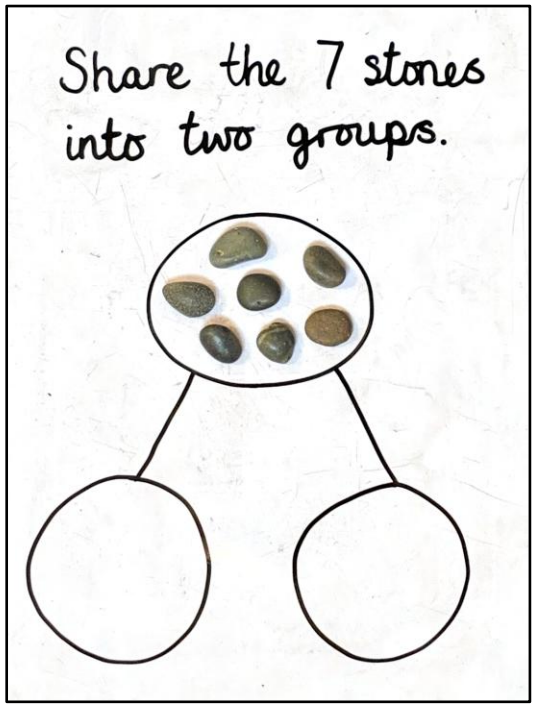
Partitioning

Specific area: Numerical Patterns

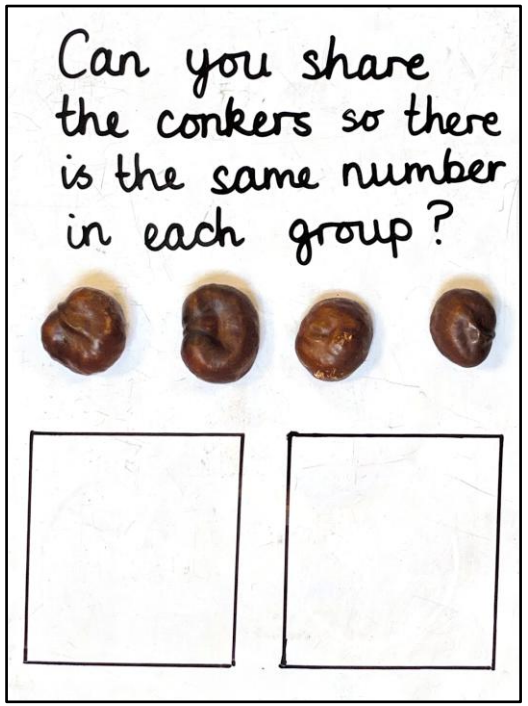
Natural objects can be used to practice sharing into equal and unequal groups.

Use part-whole models, drawings of separate groups or provide containers to put the objects into.

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3



Planting and partitioning

Specific area: Numerical Patterns

Provide a real-life context by getting pupils to plant a given number seeds into different pots, for example, you may give each child five seeds and tell them they have to split their seeds between two pots.

You could set an extra level of challenge to encourage reasoning by giving a set of rules for the pots. For example, of your five seeds total, more have to be put into the first pot than the second pot. Could you put three of your seeds into the second pot? Why/why not?

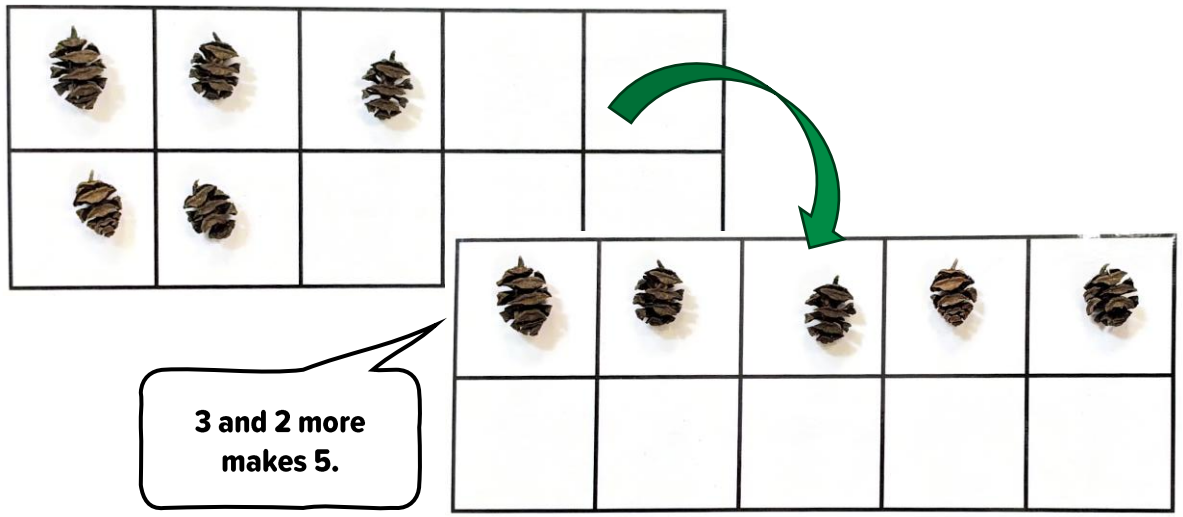


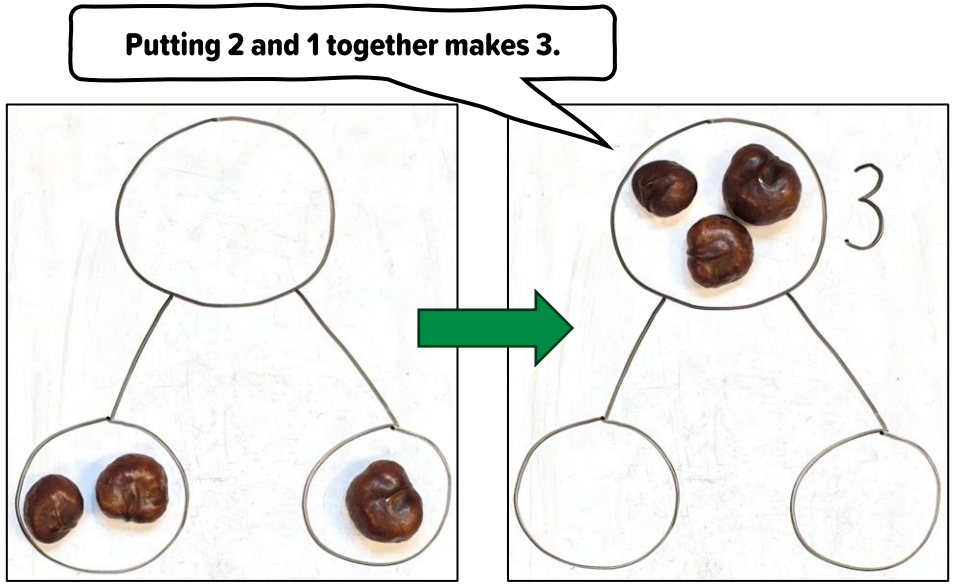
Addition and subtraction activities

Specific area: Number

Pupils use natural objects to practice adding and subtracting numbers within 10. This could be done using part-whole models, either drawn on a whiteboard or on the ground in chalk; using tens frames; or by laying out the materials and building the operation signs out of sticks.

Encourage pupils to say the whole number that the 'parts' make together. If pupils are more advanced in their understanding, they could record the corresponding equations on whiteboards or in chalk.





Subtraction skittles

Specific area: Number

Label a set of skittles with the numbers 1 – 10.

Pupils take it in turns to roll a ball to knock them down. They must then count how many skittles have fallen and how many are left standing.

Practice verbalising the sequence of events:

> "**First**, there were 10 skittles standing.
>
> **Then**, four of them were knocked down.
>
> **Now**, there are six left standing."

Once pupils are ready, model recording this as a subtraction sentence.



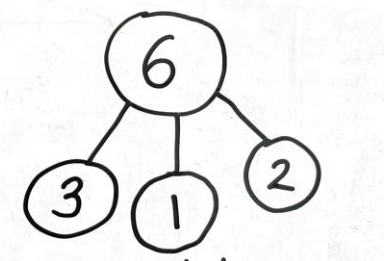
Partitioning into more than two numbers

Specific area: Number

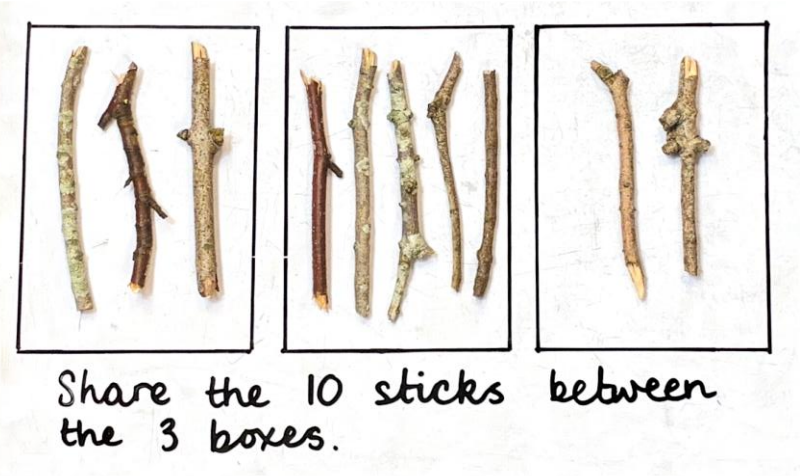
Find natural examples in the outdoor area that demonstrate how a whole can be partitioned into more than two ways/groups.

For example, different coloured flowers or leaves; different types of seeds or leaves; trees with no leaves/evergreen leaves/buds appearing.





Pupils could also be given up to 10 natural objects (or collect these themselves) and decide how to share them between 3 different groups.

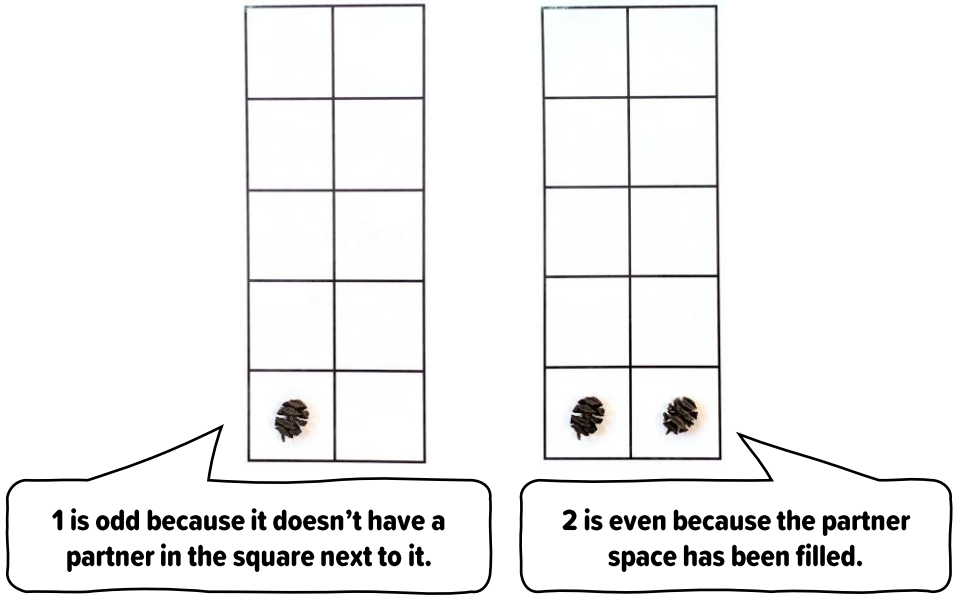


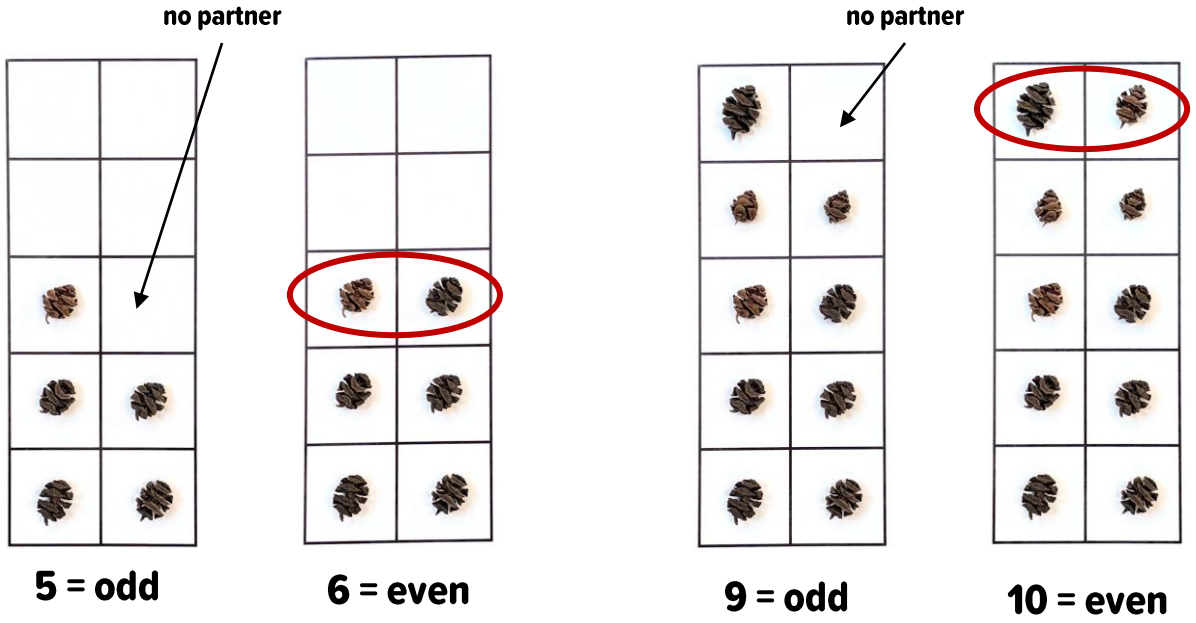
Odds and evens with tens frames

Specific area: Numerical Patterns

Explore odd and even numbers with natural objects and tens frames, to create similar visual patterns as Numicon shapes.

When pupils put a given number of objects onto a tens frame, they can see whether it is odd or even based on whether it has a ‘partner’ in the adjoining square or not.



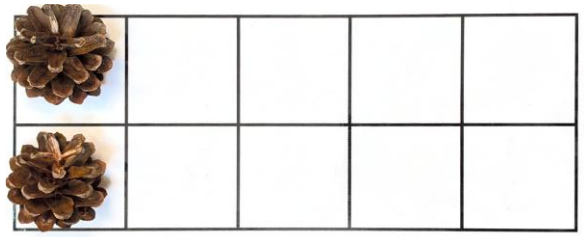


Doubling

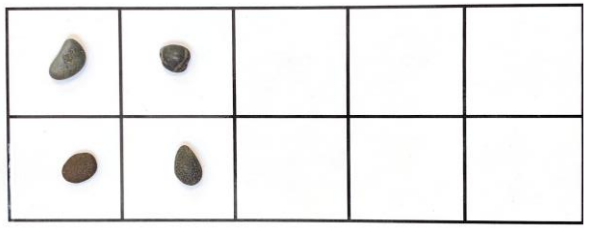
Specific area: Numerical Patterns

Ask pupils to double natural resources and find the total when doubled. A tens frame is a useful resource for doubling up to amounts up to 10, or simply draw a grid on a whiteboard/on the ground with chalk.





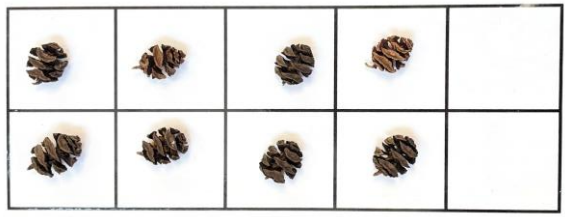
double 1



double 2



double 3



double 4



double 5

Ladybird doubling

Specific area: Numerical Patterns

Bring in a selection of rocks or collect some from your outdoor area if you have plenty.

Draw a line down the middle of each rock to represent the wings of a ladybird (if you have time, you could paint the rocks red beforehand or have this as a busy fingers activity prior to the lesson).

Using cotton buds and black paint, add spots to one half of the rock. Your pupils' task is to recreate the same number on the other side, thereby doubling the number of spots.

Ask pupils how many spots are on each wing.
How many does this make altogether?

Encourage pupils to look out for ladybirds in your outdoor space and see if they can count how many spots are on the ones they find. Perhaps you could plant flowers that ladybirds are particularly attracted to, to encourage more to visit your site.



Pattern

- Children can look for and find patterns to notice and understand mathematical relationships

Nature patterns

Explore patterns in natural objects (e.g. in flowers, leaves, ladybirds' spots, etc.) and see what pupils notice.



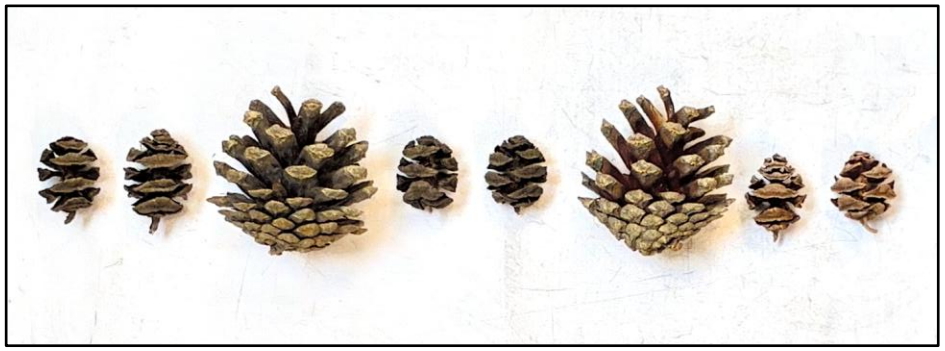


Ask pupils to continue, copy or create patterns using natural objects. Can they create simple repeating sequences and explain these?

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Nature patterns continued

To add an extra level of challenge to pupils' AB patterns, make specific requirements, such as:

- Can you do a yellow, brown pattern?
- Can you do a big, small pattern?

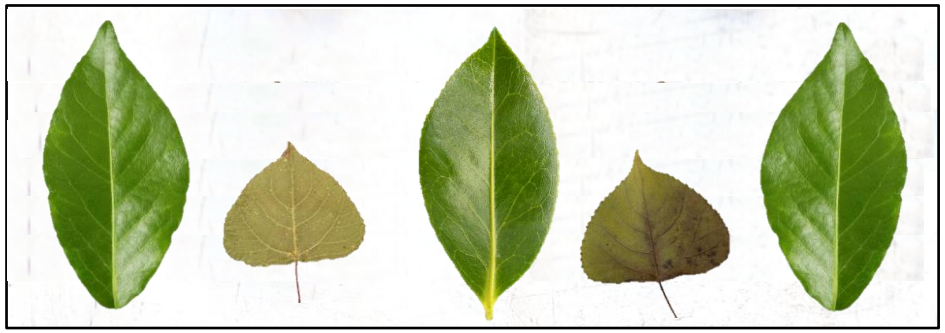
Pupils then have to find items to fit these specifications and create the corresponding pattern.

Can they also come up with their own pattern rules?

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Shape and Space

- Children understand what happens when shapes move or combine with other shapes to develop mathematical thinking

Using spatial vocabulary

Use the outdoor area as an opportunity to practice using the language of position and direction.

You could create obstacle courses; act out stories that include following a route, such as ‘We’re Going on a Bear Hunt’; have partners direct one another around, e.g. “Go behind the tree”, “Walk across the playground”, for example.





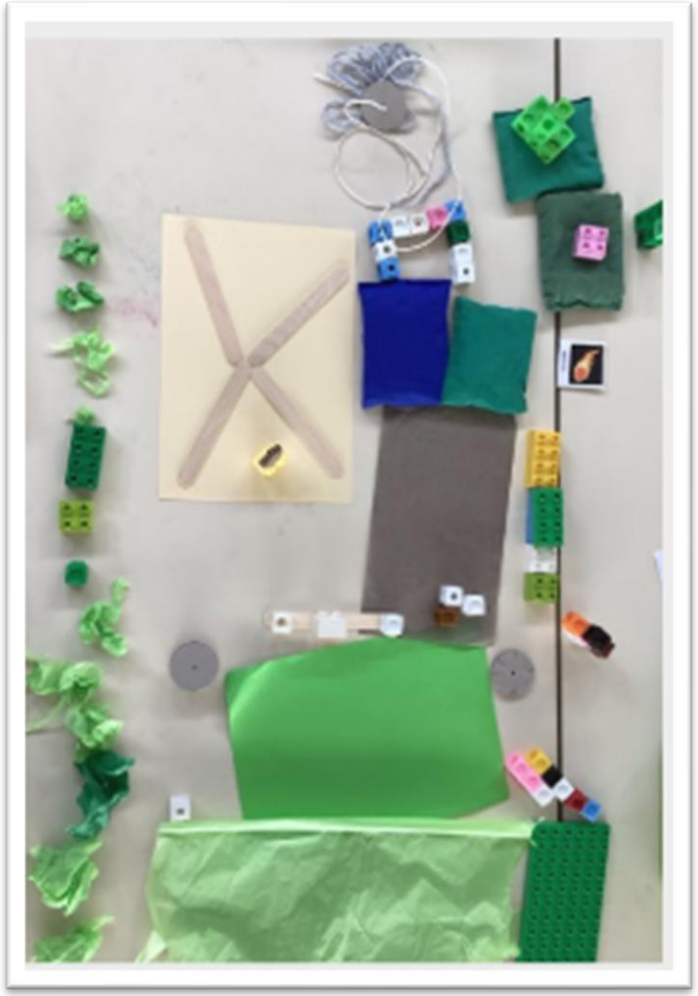




Representing spatial relationships

Can pupils create a simple representation of their outdoor area? This could be a drawing from a particular viewpoint or by using bricks/cubes/other objects to create a miniature model.

They then describe their drawings or models using the language of position and direction, e.g. “The fence is in front of the building”, “The bench is under the tree”.

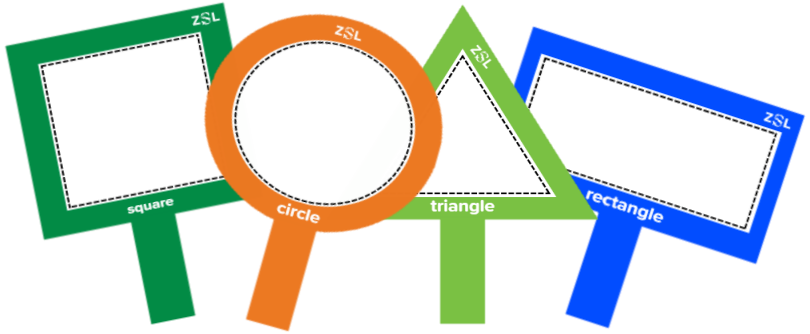


2D Shape hunt

Explore which shapes can be found in the outdoor area (both natural and manmade) and develop pupils' familiarity with both common 2D shape names and some properties. (e.g. "It is a triangle because it has 3 sides.")

You may want to provide pupils with 2D shape mats or create shape hunters to support recognition.

Challenge pupils to make these shapes out of sticks, encouraging them to explore different sizes of the same shape. Are they still the same?



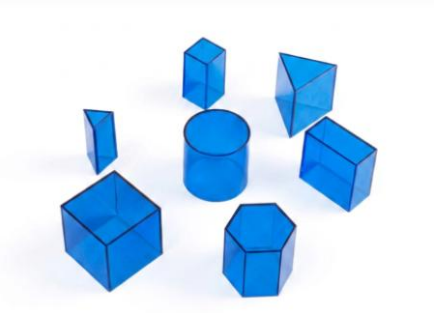
Templates available here



Which one is a square? How do you know?

3D Shape hunt

Assign 3D shapes to different groups to hunt for. If you have 3D resources that pupils can hold while looking outside, this will support them to develop familiarity with the shapes and to make comparisons with the objects they find.



Discuss what pupils have found. Which objects are good for rolling? Which objects are good for stacking? Why are the 3D shapes that have been used suitable for these tasks?













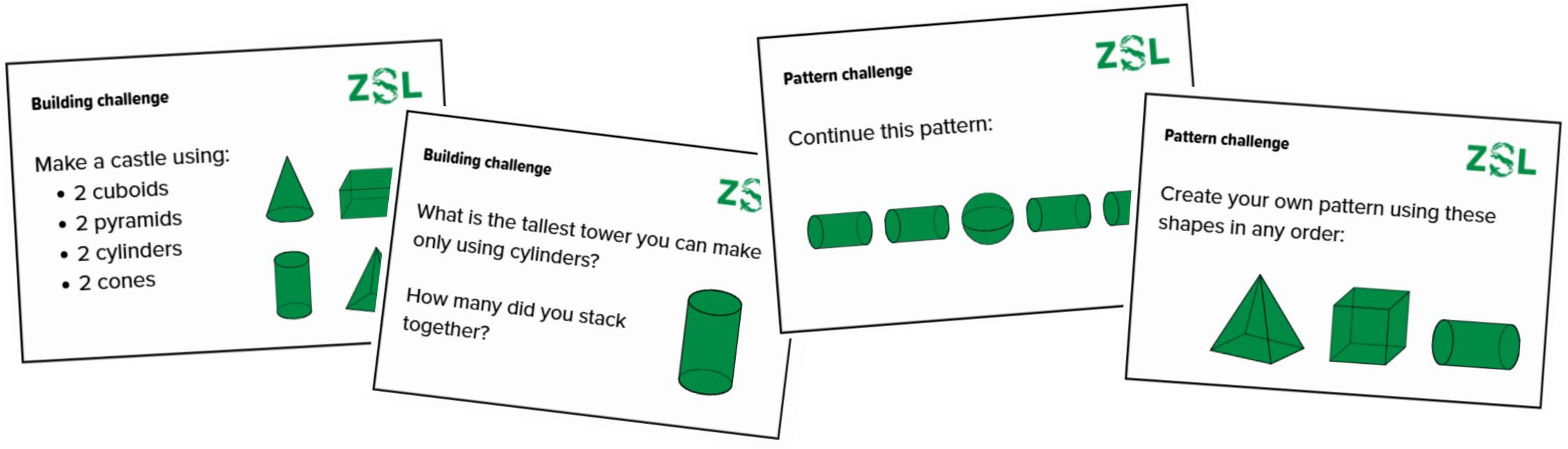


Building with 3D shapes

Using 3D shape resources or Brio blocks, set pupils challenges that involve:

- ★ Building something using a given number and type of 3D shape
- ★ Continuing or creating a pattern using given 3D shapes

Challenge cards for these activities are available **here**.



Measures

- Children can compare different aspects such as length, weight and volume

Ordering sticks by size

Ask all the pupils to collect a stick – any stick!

Gather everyone in a circle with their stick, leaving a space in the middle for everyone to eventually put their stick down.

Pupils take turns to put their stick down with the challenge being to make the line of sticks increase in size.

This can lead to interesting discussions about any sticks that are the same length but different widths, or whether a curved stick might be longer than another when straightened. Let pupils make the decision about how to sort these instances!



Comparing lengths

Cut string or ribbon the length of each pupil's arm and allow them to explore which things in your outdoor environment are shorter, longer or the same length as their arm.





You could also make a comparison between everyone's lengths of string and have the class stand in arm length order.

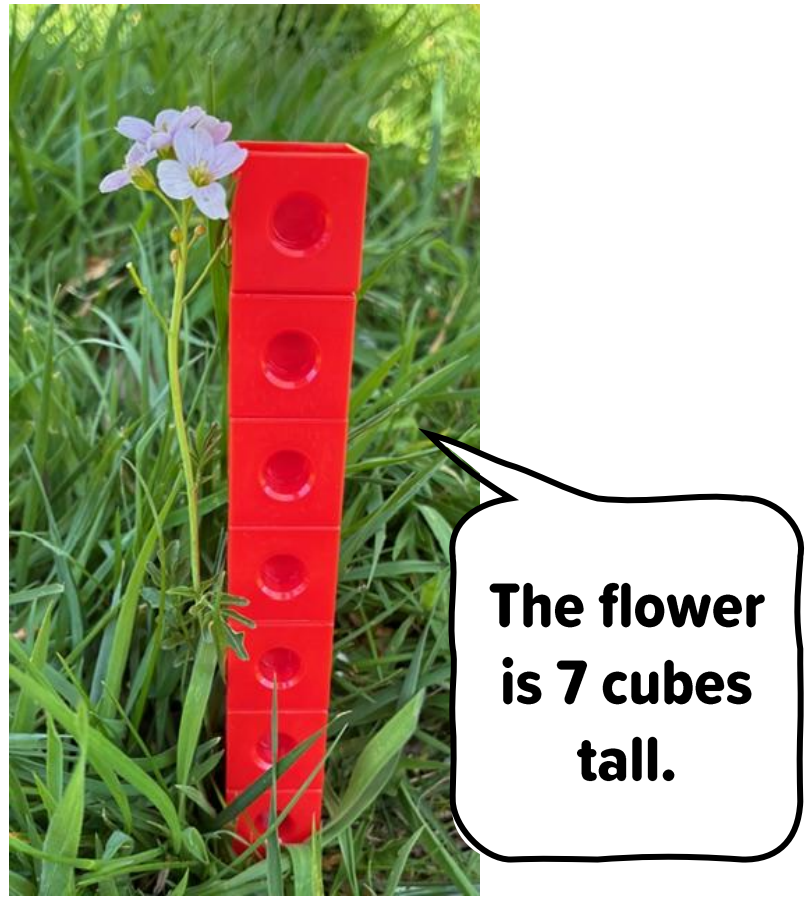
Do the tallest people in the class have the longest arms?

Measuring with non-standard units

Use hand spans, footprints or cubes to measure either distances or objects around the outdoor area.

For example, pupils could measure how many footsteps it takes them to walk from one side of the playground to the other, or how many cubes tall a flower is.

Furthermore, you could plant seeds as part of a class project and track the growth over time using cubes, recording this in a class diary.



Exploring size and number of units

Set up an area outdoors to allow pupils to explore filling containers with objects of different sizes and properties.

For example:

- Pupils could explore why it takes them longer to fill a watering can with spoons rather than bottles/jugs;
- Use equipment from the PE cupboard to find out how many different types of balls (e.g. football, tennis, ping pong) will fit into a bucket;
- Fill jars with different natural objects and encourage pupils to estimate how many of each object is in the jar







The information and guidance provided by ZSL are intended for educational purposes only. Responsibility for the safety and supervision of pupils remains with the school and its staff at all times. Teachers should only undertake activities that are appropriate to their setting and must ensure that all activities are planned, risk assessed, and carried out in accordance with their school's policies, procedures, and safeguarding requirements.