EYFS Outdoor Maths Opportunities

Cardinality and Counting

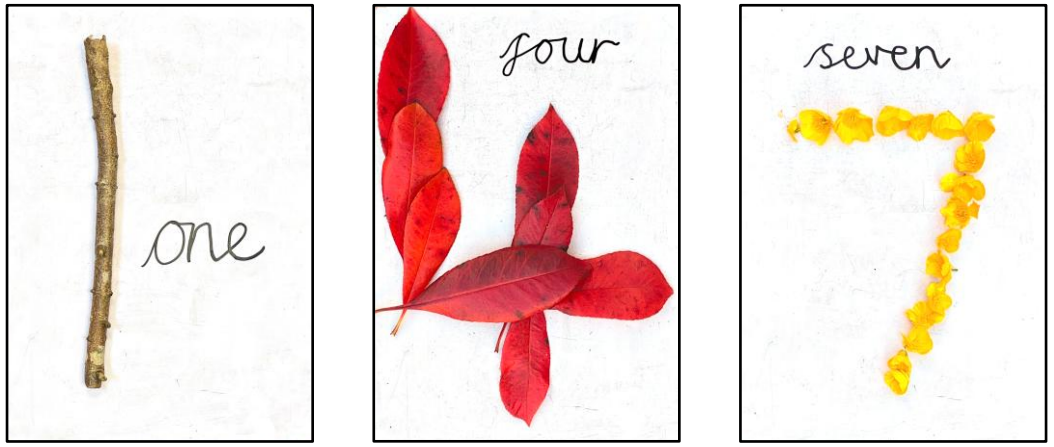
Related ELGs:

- 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

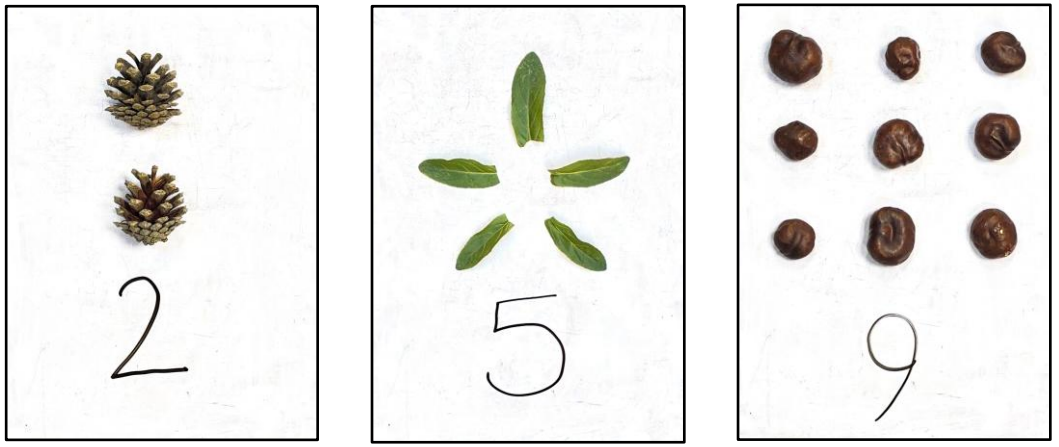
Natural numbers

Prime 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.

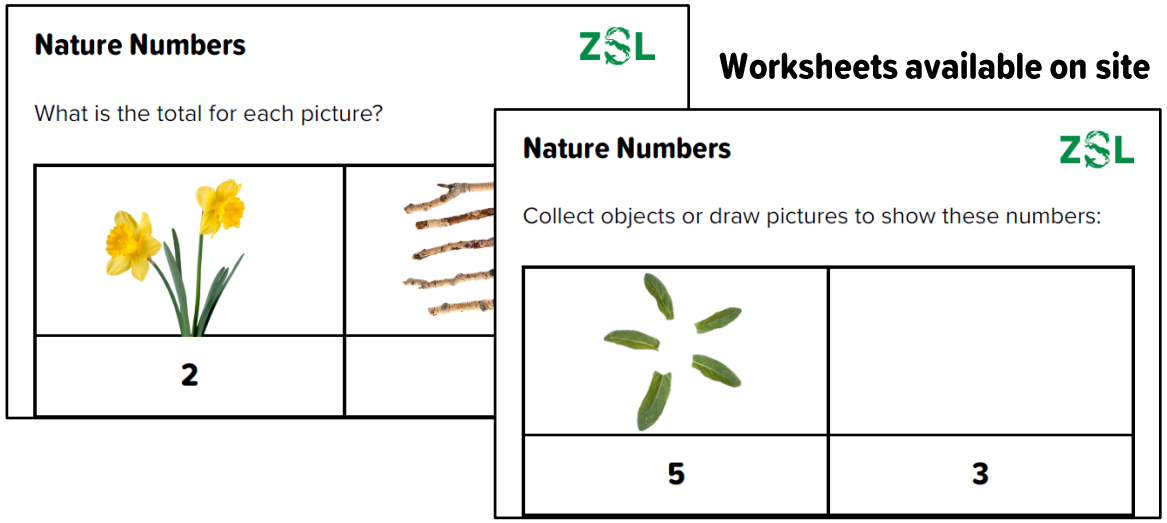


Matching numbers

Prime 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.

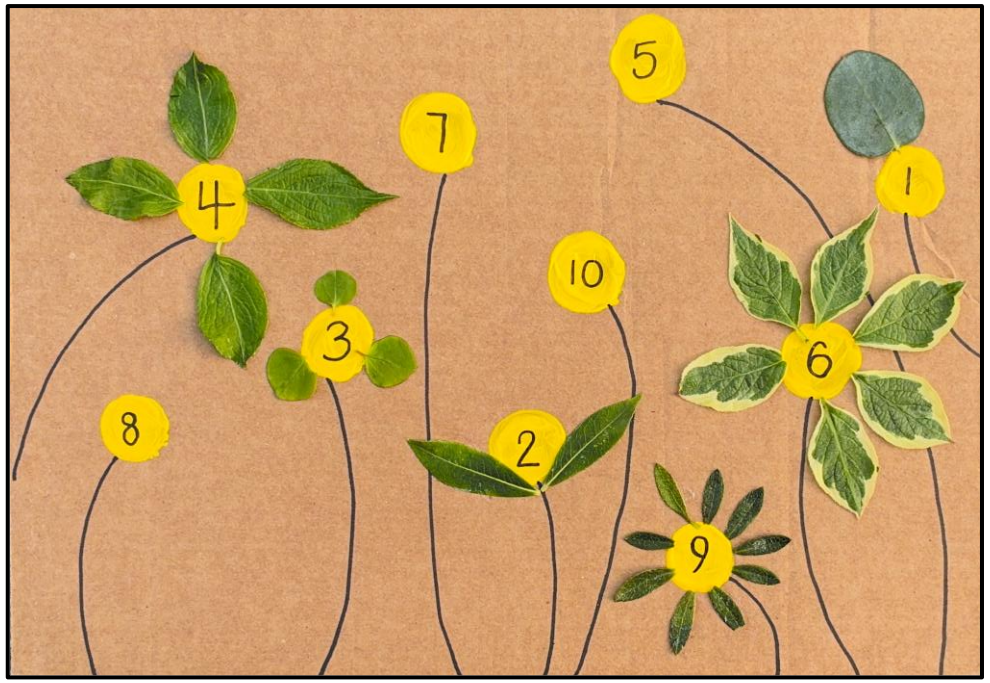


Number petals

Prime 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.

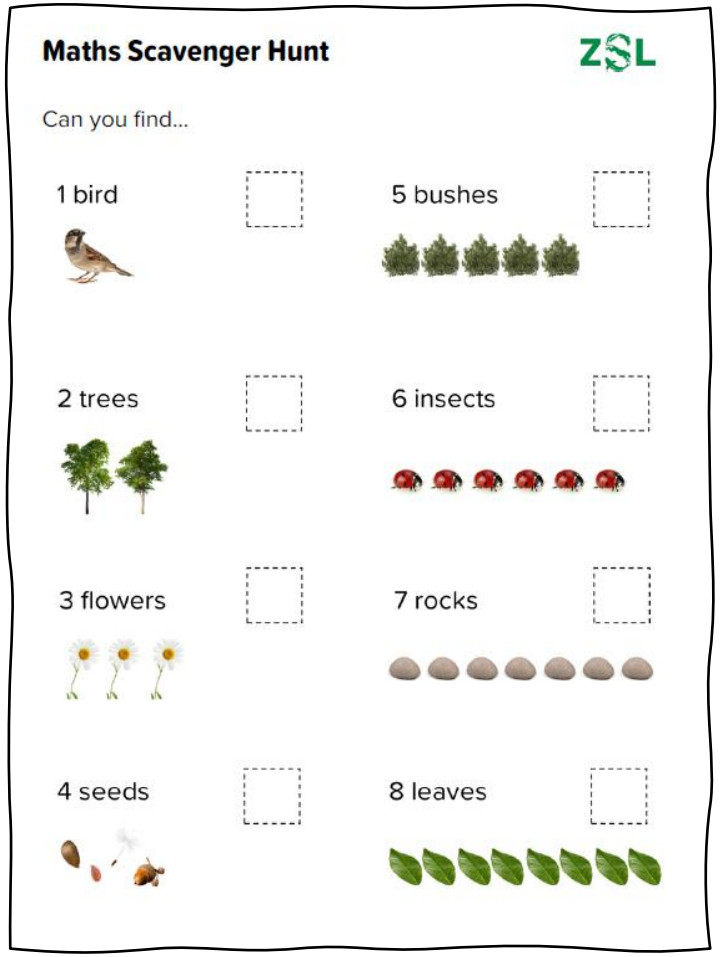
Pupils can be responsible for collecting their own leaves or choosing appropriate sizes from a selection (e.g. they will need smaller leaves for flowers that require a larger number of petals).



Number scavenger hunt

Prime 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 on site

Counting bird calls

Prime 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 some 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

Prime 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?”

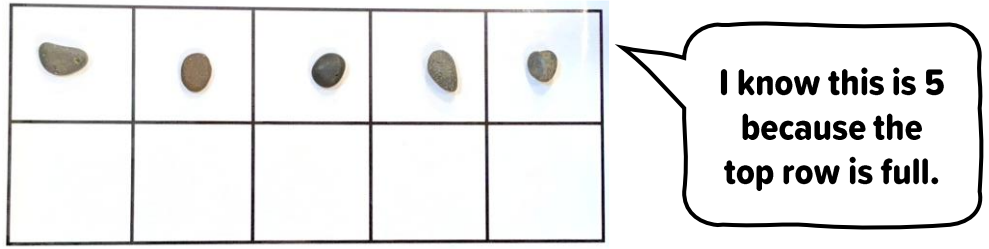
“How many pinecones are there?”

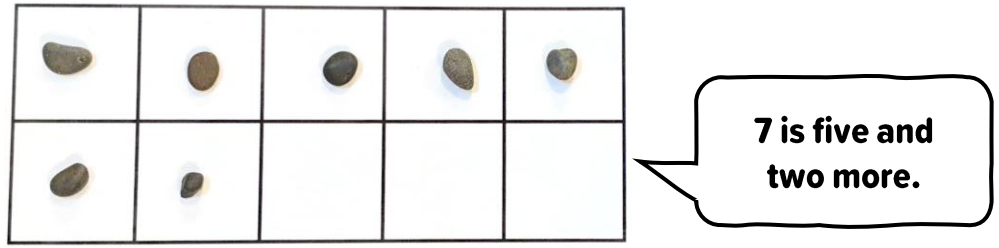
You could also ask how many there is of an object that is not present in the mix to include an appreciation of zero.

Subitising with tens frames and natural objects

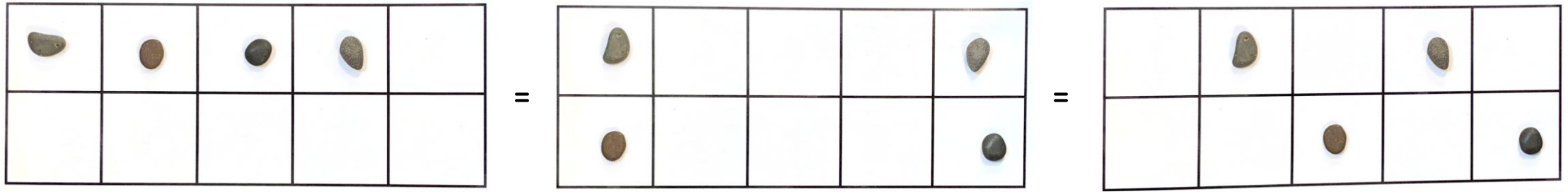
Prime area: Number

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





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

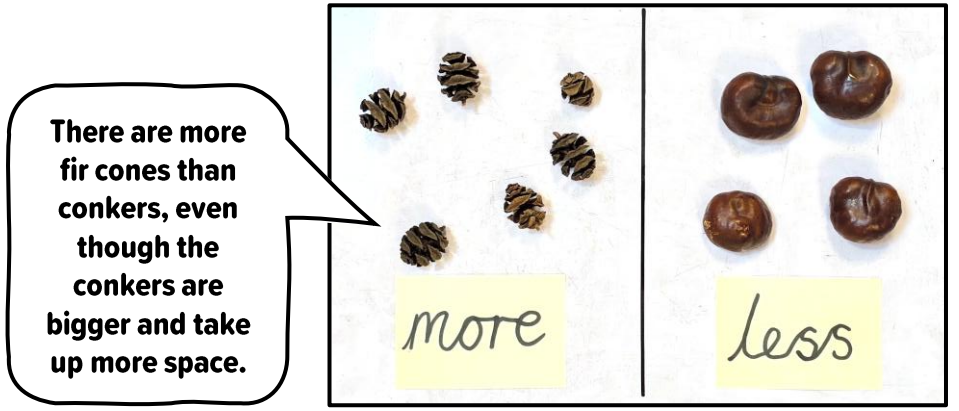
More than/less than

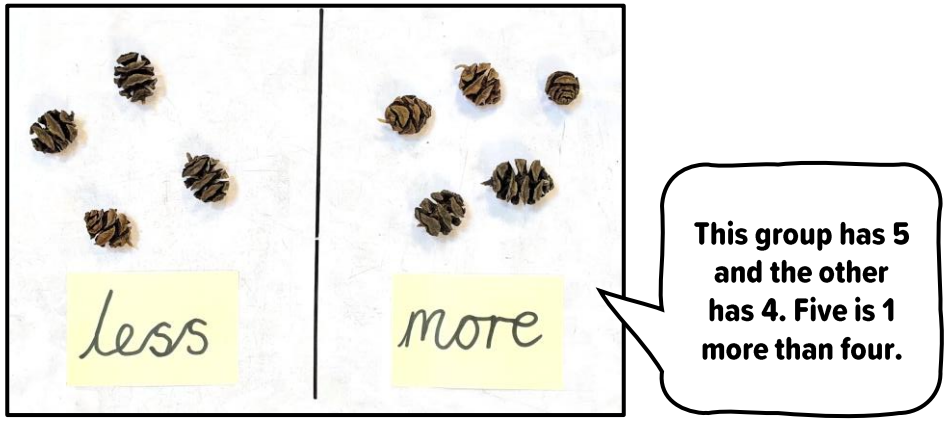
Prime area: Number

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



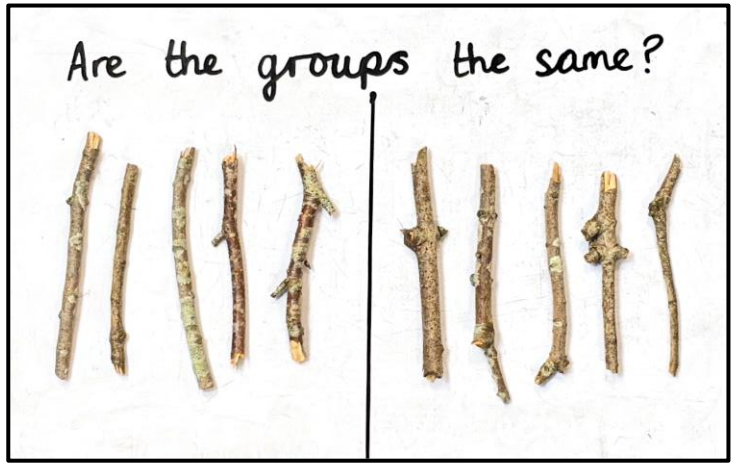


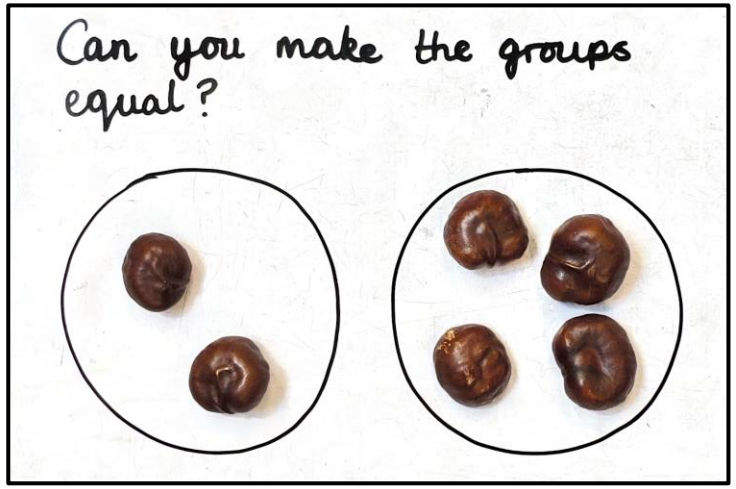
Identifying equal groups

Prime area: Number

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

Prime area: Number

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

Prime 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

Prime 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.

Partitioning

Prime area: Number

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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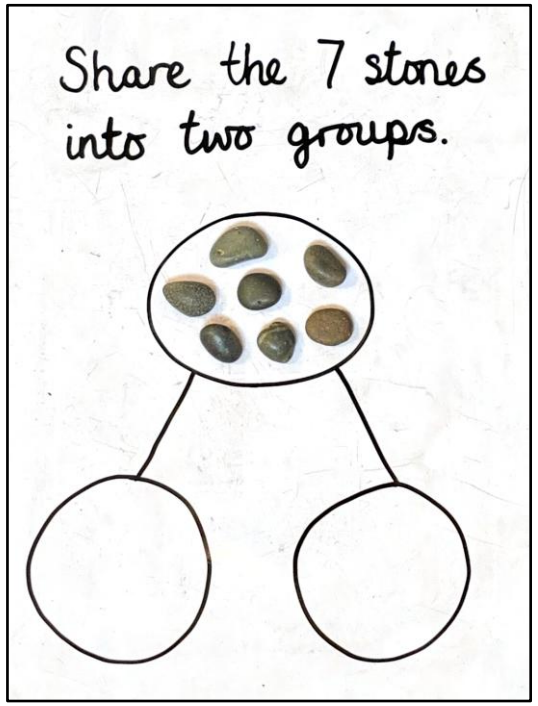

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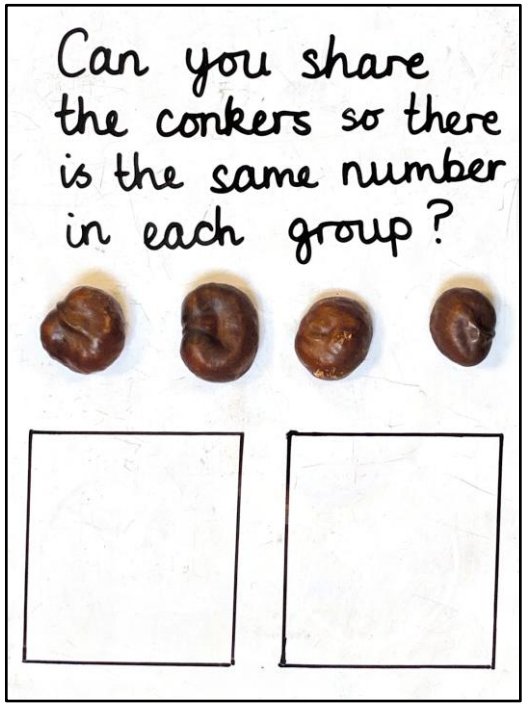

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Planting and partitioning

Prime area: Number

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.

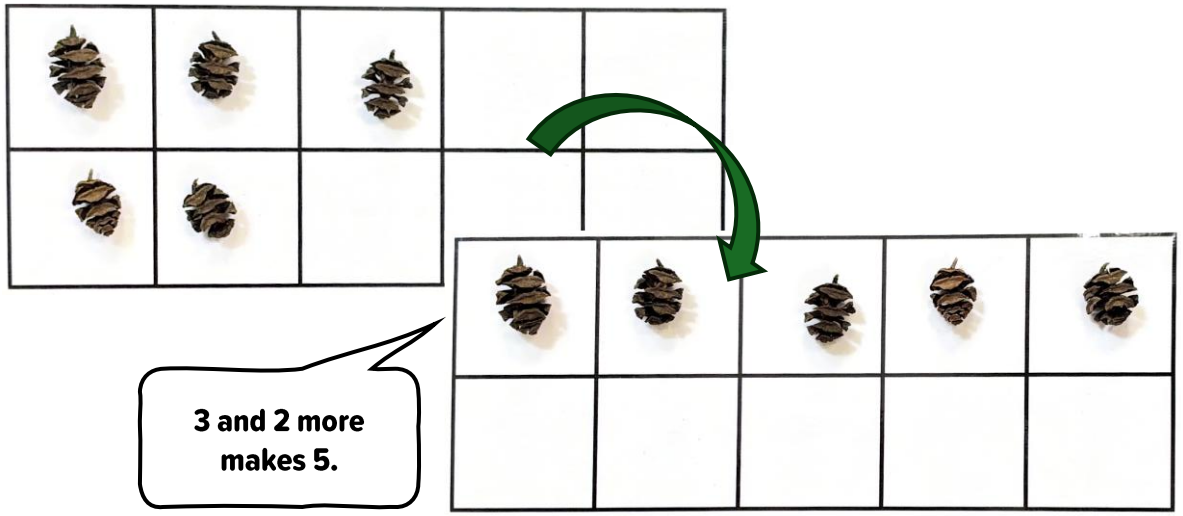
You could set an extra level of challenge to encourage reasoning by giving a set of rules for the pots. For example, of your five seeds total, more have to be put into the first pot than the second pot. Could you put three of your seeds into the second pot? Why/why not?

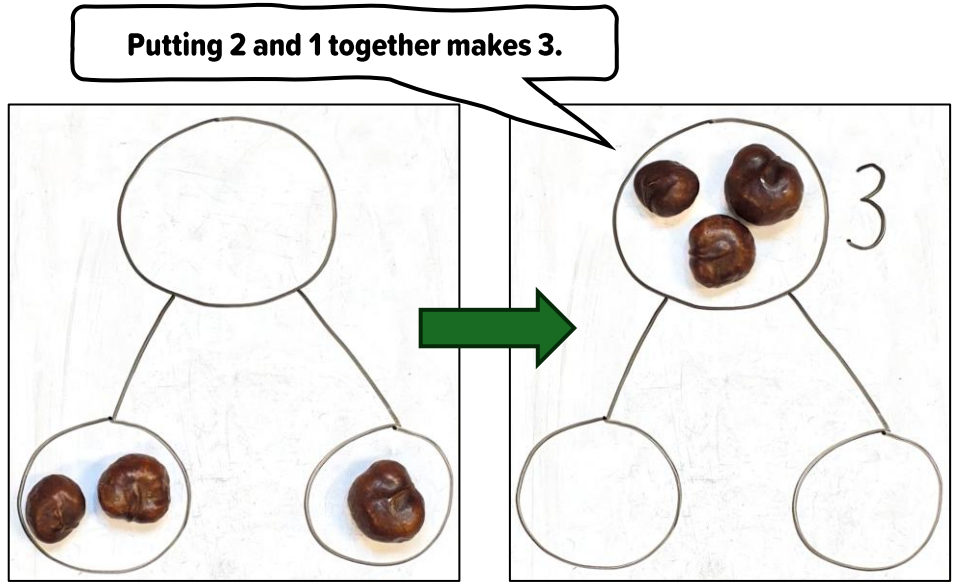
Addition and subtraction activities

Prime 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.



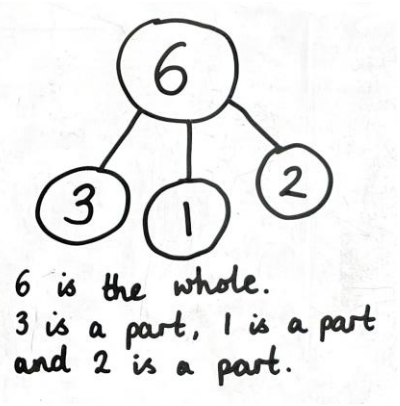


Partitioning into more than two numbers

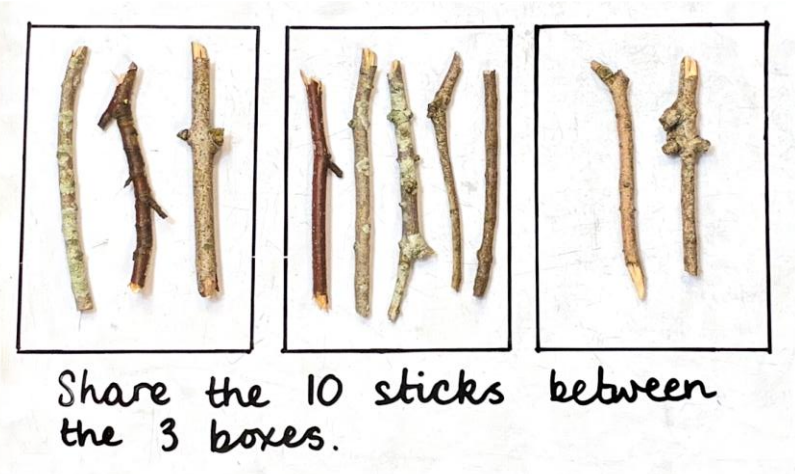
Prime area: Number

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.

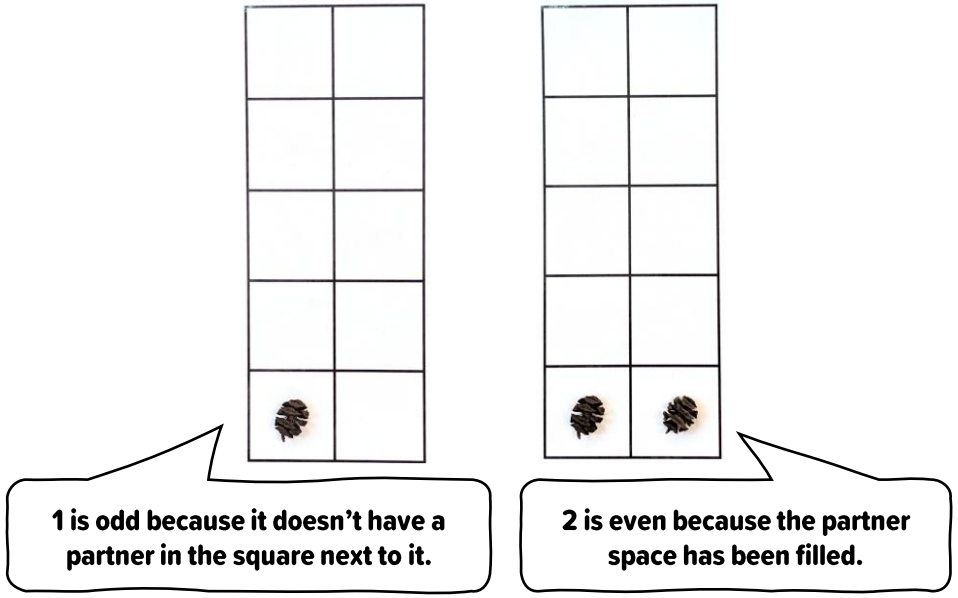


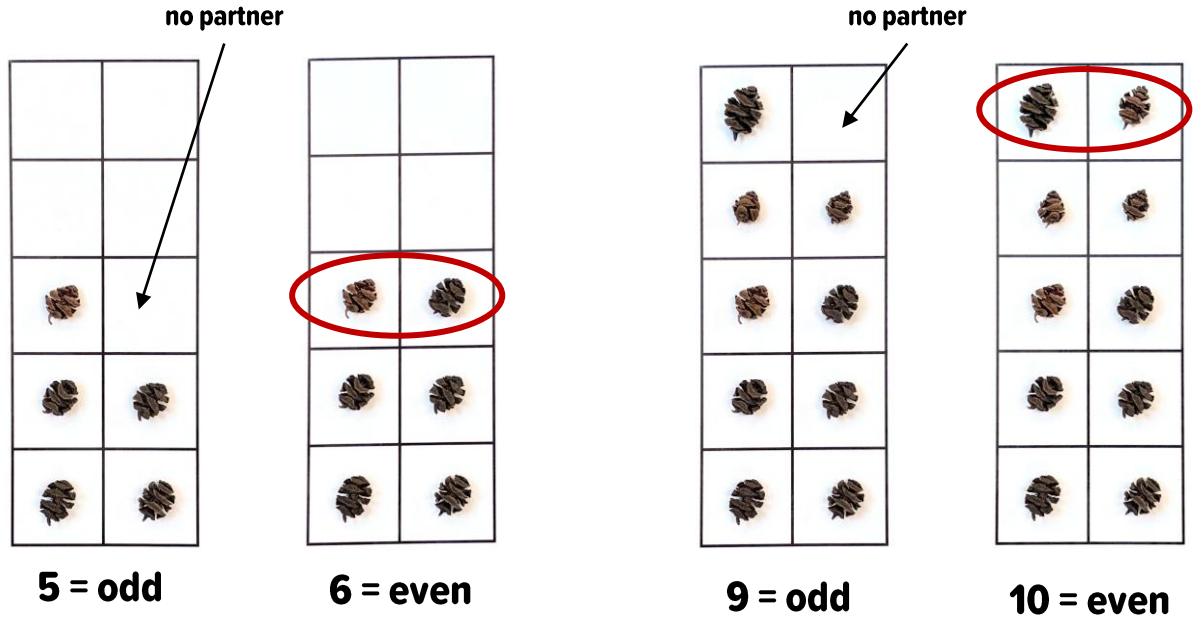
Odds and evens with tens frames

Prime area: Number

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.

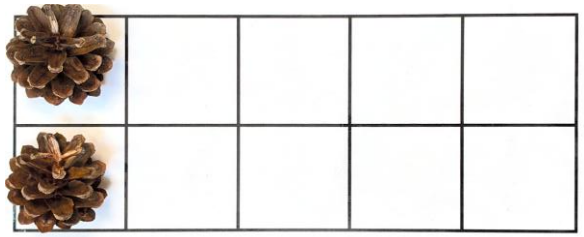




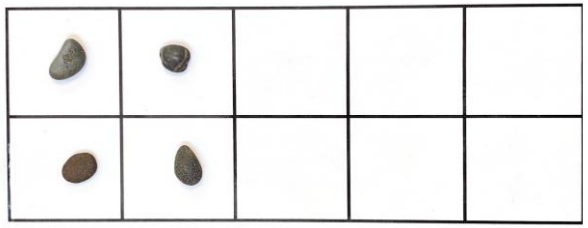
Doubling

Prime area: Number

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.

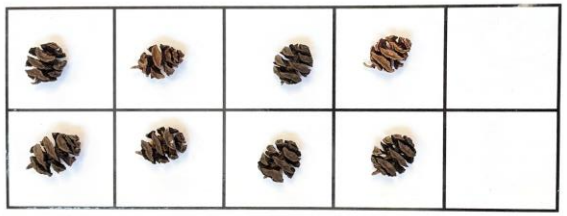


double 1



double 2

double 3



double 4

double 5

Pattern

- Children can look for and finding 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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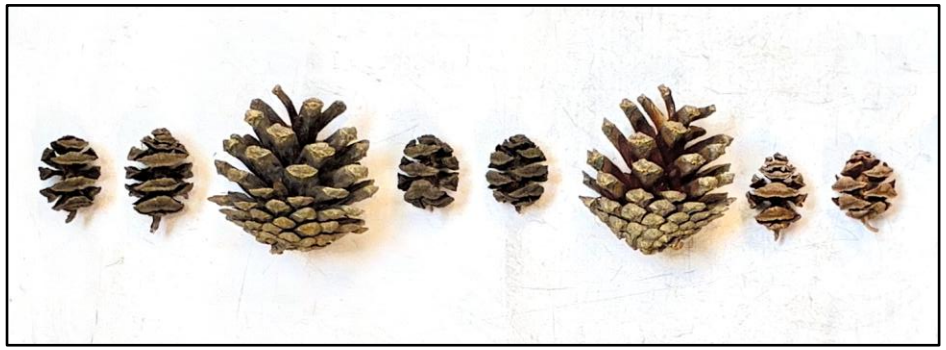

Nature patterns continued

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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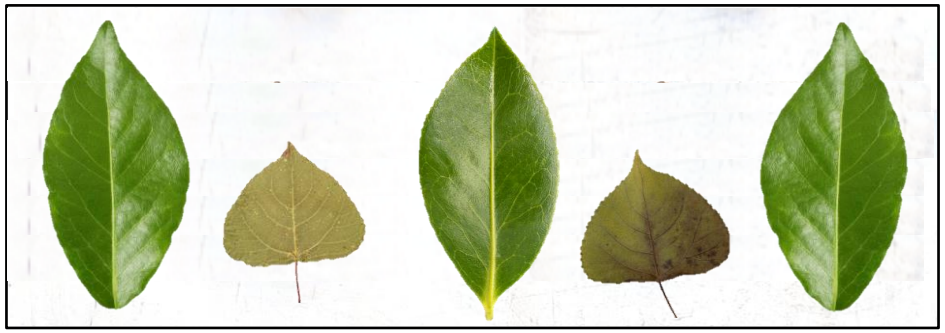


Shape and Space

- 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.

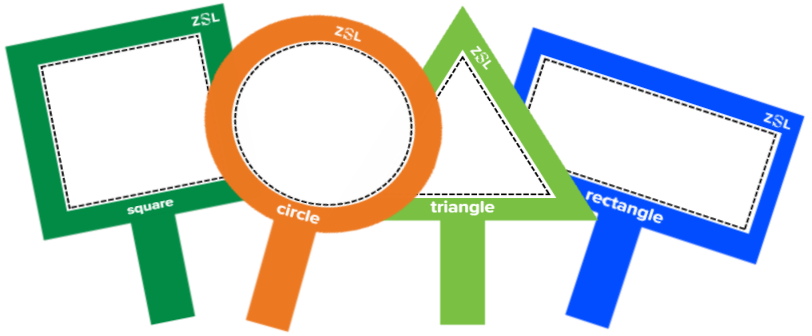
They then describe their drawings or models using the language of position and direction, e.g. “The fence is in front of the building”, “The bench is under the tree”.

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 on site

Which one is a square? How do you know?

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.

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.

The flower is 7 cubes tall.

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