



NRICH

Collecting

Sorting and Describing, using mathematical properties such as size, shape and pattern.

Counting and comparing numbers.

Understanding the characteristics of 3D shapes



Children often enjoy making collections of natural or found objects, like leaves, pebbles or buttons, making subgroups, arranging them in patterns or putting them into containers.

Adults could provide varied assortments of all kinds of objects such as shells, miniature toys or fabrics, or take children on collecting trips outdoors, providing containers for sorting and opportunities to display arrangements.

The Activity

Take children on an autumn walk with collecting bags and invite them to choose something to collect, such as twigs, conkers or ash-keys. (You will need to observe usual health and safety procedures - well trained not to put hands in mouths and check for allergies.)

Encouraging mathematical thinking and reasoning

Describing

Tell me about your collection . . .

Have you seen shapes like these before?

Recording

What a lot you've got!

Do you want to make a label for your collection and show how many there are?

Reasoning

Why do you think they are like . . . ?

Is there something else you can think of that could belong here?

Opening out

Can you find another way to sort your collection?

What if you sorted them into the divided tray?

Is that tray big enough? (Can you find one that is?)

Resources

In You will already have lots of collections of things in your setting. You might provide assortments which:

- have potential for shape and pattern spotting, such as buttons, fabric scraps, wrapping paper, cards
- are miniature objects, such as cars, small people or animals
- are connected with parents' jobs or activities, eg nuts and bolts, wood or material fragments, packaging, tickets
- are part of a role play area eg treasure, hats, shoes, tools, boxes
- are specifically mathematical eg numerals in different fonts, blockplay shapes
- are available cheaply, at scrap schemes, pound shops or car boot sales

The Mathematical Journey

Same and different:

- grouping according to a rule eg buttons with two holes
- developing language to compare and contrast shapes and measurement properties, using informal vocabulary such as pointy, fat, wiggly, progressing to mathematical terms like straight, round measures or from bigger, fatter, to more specific terms like longer, wider, heavier, holds more

Shape, space and position:

- grouping by properties like curved or straight
- arranging in straight or curved lines, making shapes or patterns

Number:

- noticing amounts increase as more are collected
- counting and cardinality – progressing from knowing some number words, to saying one number for each object, then knowing the number of the whole group
- relative number size – comparing numbers
- part –whole numbers – noticing numbers within numbers, for subgroups within collections

And more ways into the same mathematics and other resources that may be used

Child initiated collecting

Outings—children might be stimulated to collect in outdoor environments such as woods or a park. If you note what children are interested in, you can supplement collections back in your setting

NB You may need to deter children from picking flowers or collecting unsavoury objects like litter (or ensure they wear gloves)!

Making provision to stimulate collections

Hide collections in sand, around the setting or outdoor area – or put in water to be 'caught' and fished out.

Provide containers of different sizes and shapes, especially with compartments, like printing trays, chocolate boxes, bun or plant trays

Display collections in compartments with labels

Use light boxes to look at shapes of silhouettes

or place between hinged mirrors– collections put between them will appear much bigger!

Provide purposes for sorting and arranging eg resources for tidying and checking, for creative work or for a shop or role play area

Additional resources

Cameras to take photos of collections especially of temporary arrangements out of doors.