

# Helping your child with reasoning in mathematics

## National Curriculum

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics,
- reason mathematically
- can solve problems

## What is reasoning in mathematics?

Reason mathematically in mathematics is: following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

## Why should you help your child to reason?

Research by Nunes (2009) says that 'ability to reason mathematically is the most important factor in a pupil's success in mathematics... Such skills support deep and sustainable learning and enable pupils to make connections in mathematics'.

## Creating and thinking critically at home

- Model being a thinker, showing that you don't always know, are curious and sometimes puzzled, and can think and find out
- Encourage divergent thinking: what else is possible
- Value questions, and many responses, without rushing towards answers too quickly

- Support your child's interests over time, remind them of previous approaches and encourage them to make connections between their experiences
- Encourage your child to learn from their siblings
- Model the creative process, showing your thinking in as many possible ways forward
- Give reasons rather than directive 'rules' for any limits on your child's activities
- Be a sensitive conversational partner and co-thinker
- Show and talk about strategies - how to do things – include problem solving, thinking and learning.

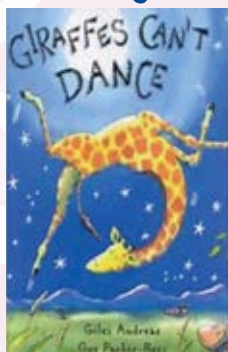
## Challenges your child to think and talk about their own learning process with questions such as:

- How did you do that?
- How else could you have done that?
- Who did that a different way?
- What could you do when you are stuck on that?



## Activities and ideas to help your child with reasoning at home

### Reasoning in Stories



When reading with your child look for opportunities to practise reasoning

### The following activities link to the book: **Giraffes Can't Dance** by Giles Andreae and Guy Parker-Rees

Pick a page with lots of animals on. Which animal is the odd one out? Why? Spot the difference between two monkeys. Which is your favourite animal? Why? Which animal is the fiercest/ gentlest? Jungle dance page – who is having the most fun? Why?

Five meerkats. Count in fives, make a mistake, can your child spot the mistake?

True or false? There are more legs on four crickets than there are on six giraffes.

What is similar or different between a hippo and a rhino? What is similar or different between a zebra and an antelope?

Other activities linked to the book:

Make a shopping list of items that might be needed for the Jungle Dance. How many of each item might be needed? How much would it all cost?

How tall are the different animals in the story (e.g. cricket, warthog, lion, giraffe). Find out, or make a sensible estimate of, their height and make a graph to show the results. The animals think that Gerald can't dance. Sometimes people say 'there is no such word as can't'. What does this mean? How might Gerald feel when the other animals are laughing and waiting for him to dance?

For further information visit [www.bexleyeis.co.uk](http://www.bexleyeis.co.uk)

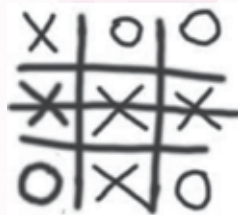
How should they behave instead? Discuss what the difference is between laughing at someone and laughing with someone

### Convince me

Tell your child that he/she is going to have to convince you about why he/she should be able to do something, but he/she will only be able to do this after he/she have considered a range of reasons and used their reasoning skills. Emphasise that they cannot make this decision on guess work.

Things they could consider are: weather conditions, his/her behaviour, whether he/she has completed their homework, how tidy the bedroom is and so on. Encourage your child to explain their reasoning as well as their decisions.

### Games: Nought and crosses



### In the home

Look at the family photos, in which way are people similar or different?

### In the kitchen

Collect some different chocolate bars; ask your child: Which one is the odd one out? Why? What do they have in common? Ask your child to sort them e.g. size, flavour, added ingredients etc.

Convince me: Ask your child to convince you about why they should be able to eat a particular food.

### In the bath

Explore: The taller the container, the more water it holds. Discuss whether this is always true, sometimes true or never true.

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