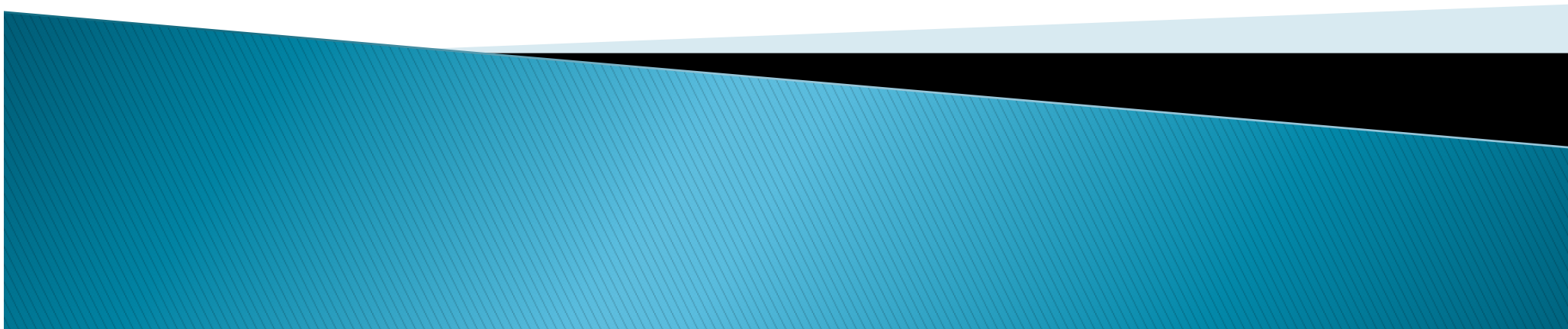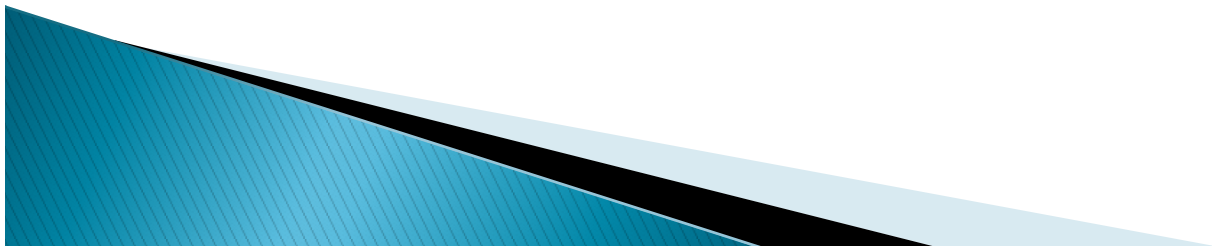# How we teach Maths in school 2017
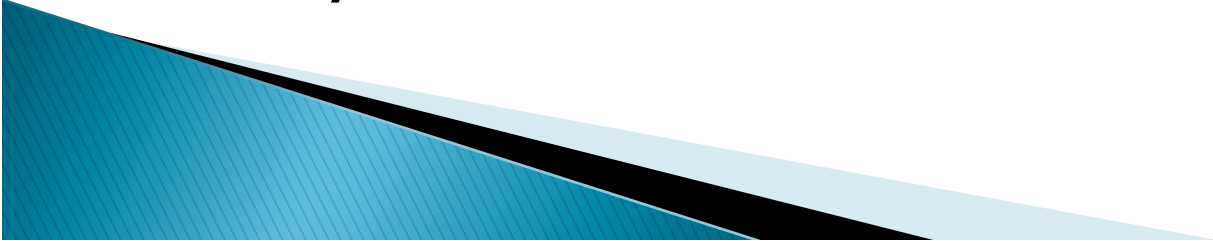
# Growth Mindset

- How we were taught Maths at school and how we felt about it will have an impact on the messages we send to our children.

- Understandably if your experience was not a positive one you are likely to not like Maths and possibly be quite open about 'I'm not any good at Maths.'
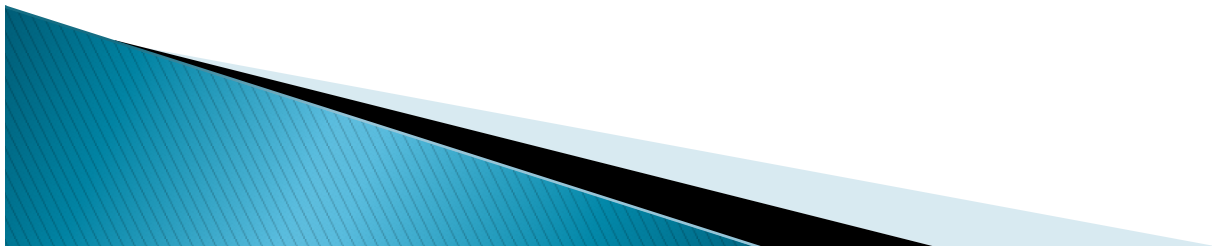
# Mindset

- Imagine if you have been told by your child's teacher that they require more support with Maths. How many of you have responded with 'They get that from me, I was no good at Maths'.

- But would you be so willing to say the same for reading, writing, making friends?

- Why is that?

# Growth Mindset

▸ Unfortunately the perception of Maths goes further than our individual feelings and attitudes. (Maths video 1)

▸ As you can see we have a somewhat large mountain to climb with regards to Maths! That's why it is important that we promote a positive mindset and not let our own experiences influence our children's views.

# Mathematical resilience

- Children find it hard to fail. More able children in particular find it hard.

- We need to challenge all children, if not we are not showing them that at some point everyone struggles.

- We create a safe environment where it doesn't matter if they are wrong. If we make a mistake we say 'my brain got bigger' because we are learning from the mistake.

- It is important to make links. If you are slow it doesn't mean you aren't good at Maths.

- Everyone can get better at Maths… if you put the effort in.
- (Maths video 2)

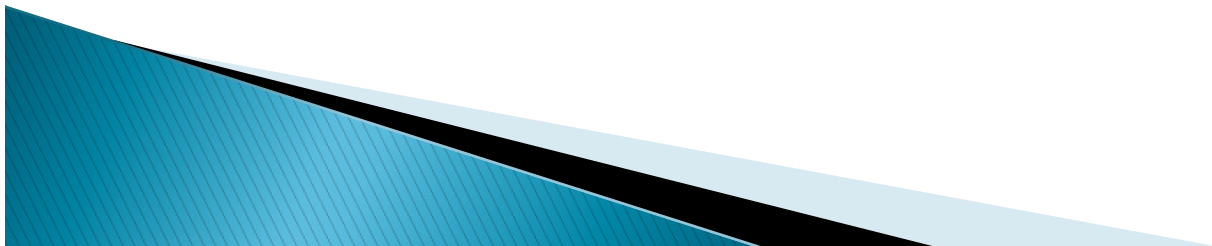# Determination / Perseverance / Resilience

- In truth everyone can learn Maths to the highest level.
- This is the message that we are passing on to children at our school.
- We create a 'you can't do it yet' ethos in all of our classrooms. The emphasis is on the word 'yet'.
- Every child is encouraged to have a go and if they make a mistake then they / we as a class can learn from it.
- We talk about being determined, having perseverance and being resilient.

# Mistakes

- Mistakes are valuable.
- When you look through your child's book it is important to remember that it is okay to see mistakes.
- The mistakes will show a progression in your child's thinking.
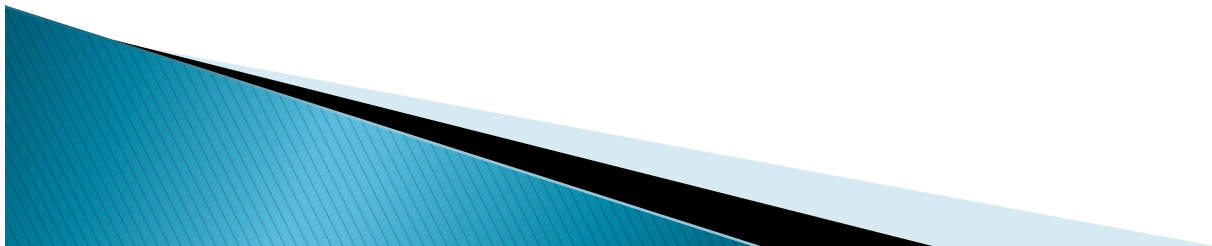- It is important not to focus on the mistakes but the learning that came from them.

# Questions

- Questions are really important and are encouraged from the children.
- Mathematics is about connections and communicating, so a Maths lesson is not a quiet lesson!
- Asking 'What do you notice?' Is an excellent way to get children to talk about their Maths. What they notice could range from shapes, patterns, number facts, doubles etc the answer will often vary from child to child and there is on one correct answer.
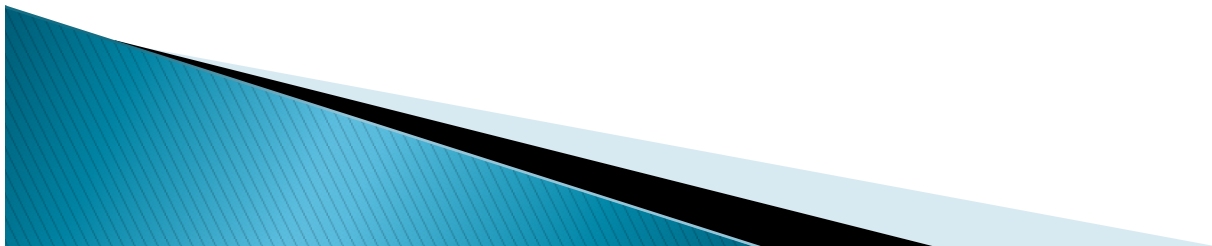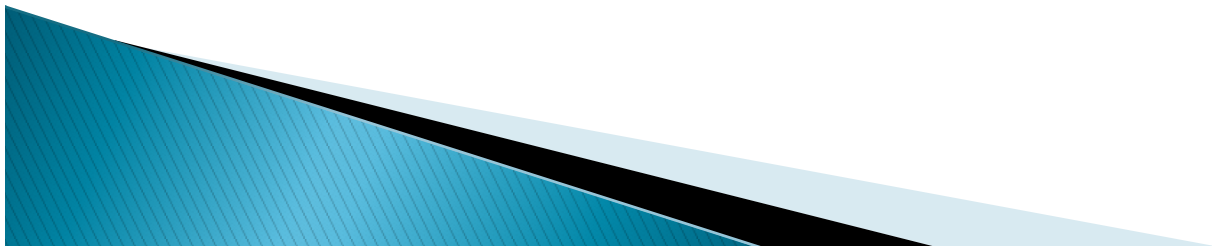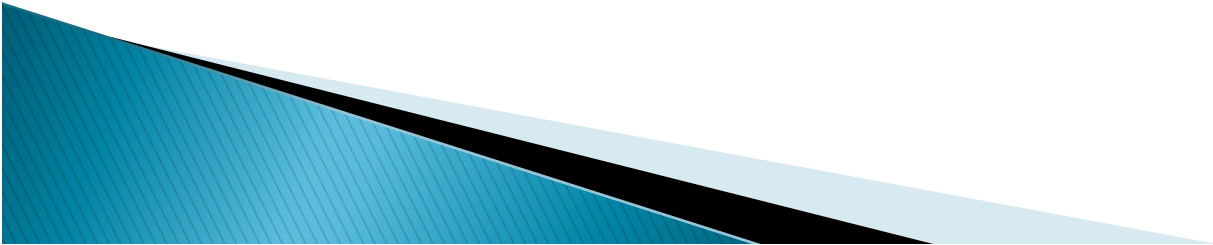
# Maths Talk

- Children need to talk and to experience a rich diet of spoken language in order to open up their thinking and learning.

- We encourage them to speak in sentences rather than just give one word answers and for them to use the Maths vocabulary they hear modelled by adults in the classroom.
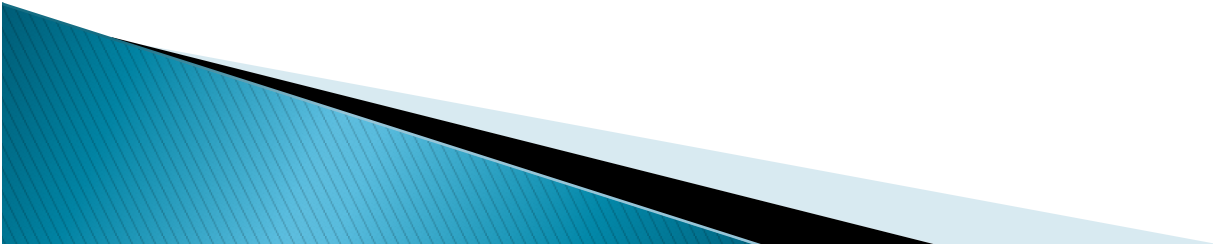
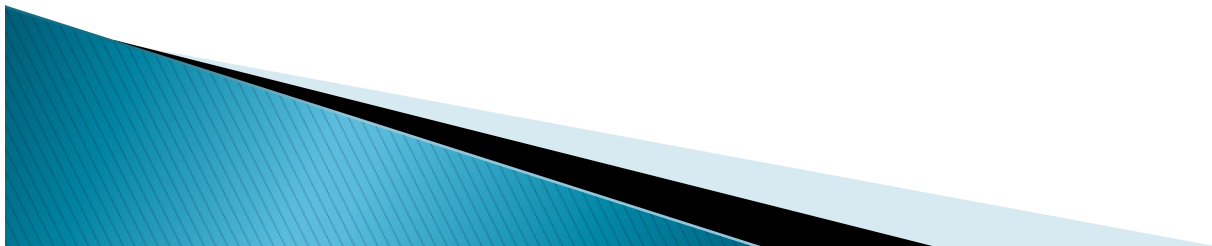# The only way to learn Maths is to do Maths.

# EYFS Curriculum

- In EYFS the children learn through child initiated play in their Maths rich environment both indoors and outdoors. They will be encouraged to talk about their Maths and be challenged in their thinking through discussions with an adult.
- They also learn through direct teaching with their teacher.
- Daily Maths will involve counting and singing number rhymes in addition to direct teaching.
- The teaching of Maths is very much hands on and practical which is immersed in the other areas of learning.
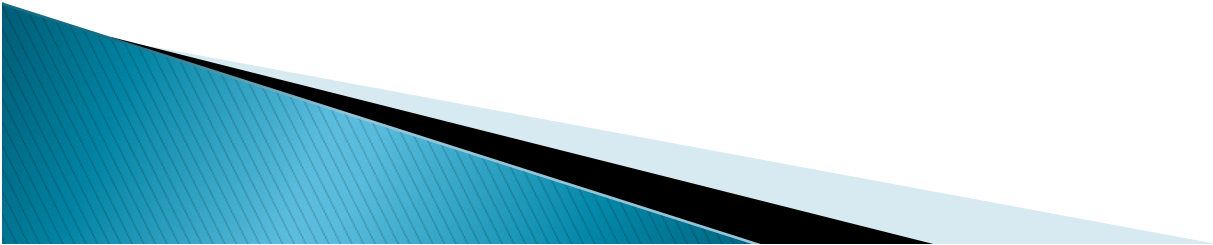
# KS1 Curriculum

- In Years 1 and 2 the children have a daily Maths lesson. On occasions they may have some lessons blocked together to allow longer sessions to develop their problem solving skills.
- Daily planning ensures that all children can make progress with individual needs being met the next day either through additional support, consolidation or extension.
- Activities are still very hands on and practical.
- There is a greater emphasis on recording.

# Curriculum

▶ The focuses on 3 aims:

▶ Become **fluent** in the fundamentals of mathematics, including through varied and frequent practise with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply rapidly and accurately.

▶ **Reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

▶ Can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
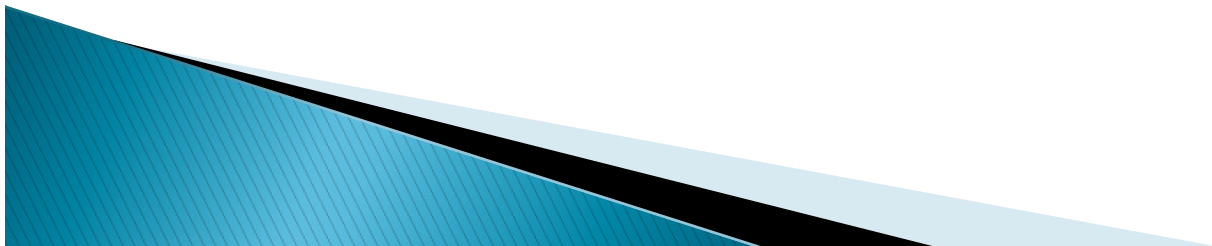
# Curriculum

- These aims are embedded in all lessons from EYFS to KS1.
- We encourage children to make links between their Maths. To use what they already know to help them work out something new.
- We ask children to explain how they worked something out and why they think it is right.
- Activities are based around problems to solve including, true and false questions, do you agree and odd one out.
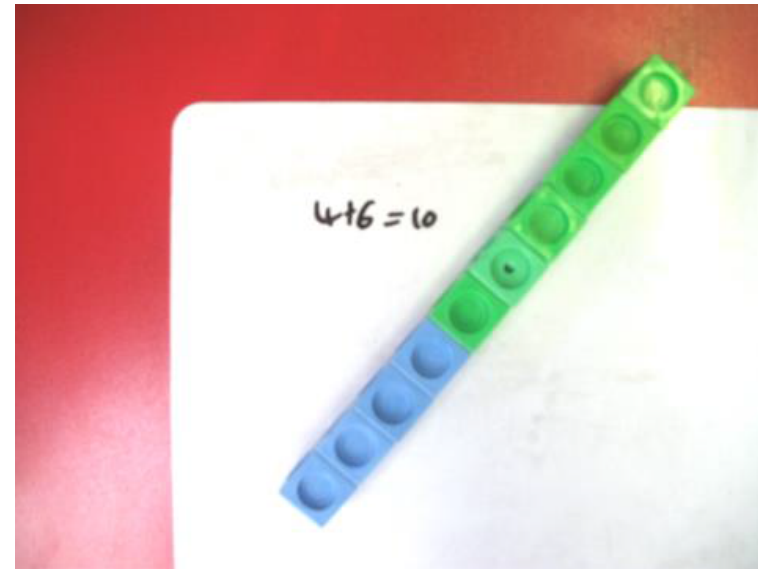
# Addition

- Addition is the process of combining 2 or more quantities.
- Early learning.

- Counting in 1s forwards and backwards.
- Counting how many objects they see.
- This will move on to using apparatus or fingers to find 1 more.
- They will be introduced to the written numbers and then the + symbol.
- Children will then begin to relate addition to combining two groups of objects.
- They will record in pictures, words or symbols.
- Construct number sentences to go with practical activities.
- Solve simple word problems using their fingers.

# Addition

▸ Children will begin to double given equipment.
▸ They will use their knowledge of the number system to count along a number line.
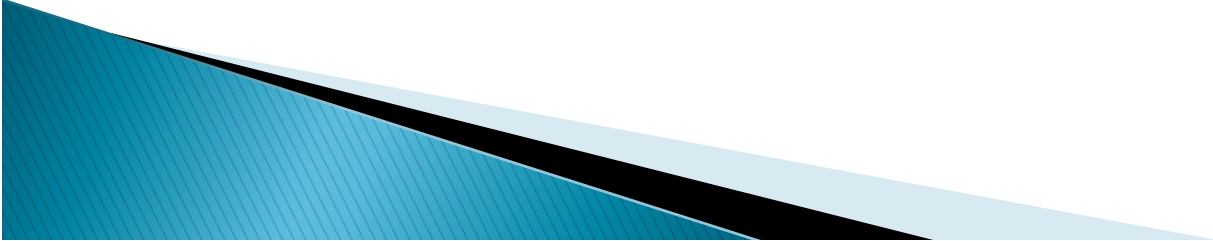▸ They will use equipment to find number bonds for numbers up to 10.

# Addition

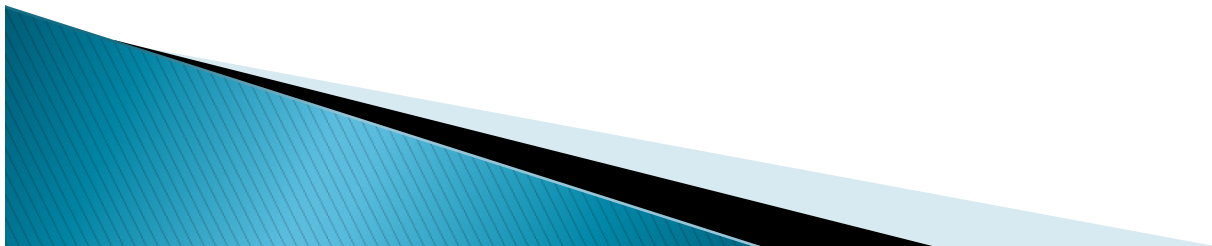- Next they find number bonds of numbers up to 20 and beyond.
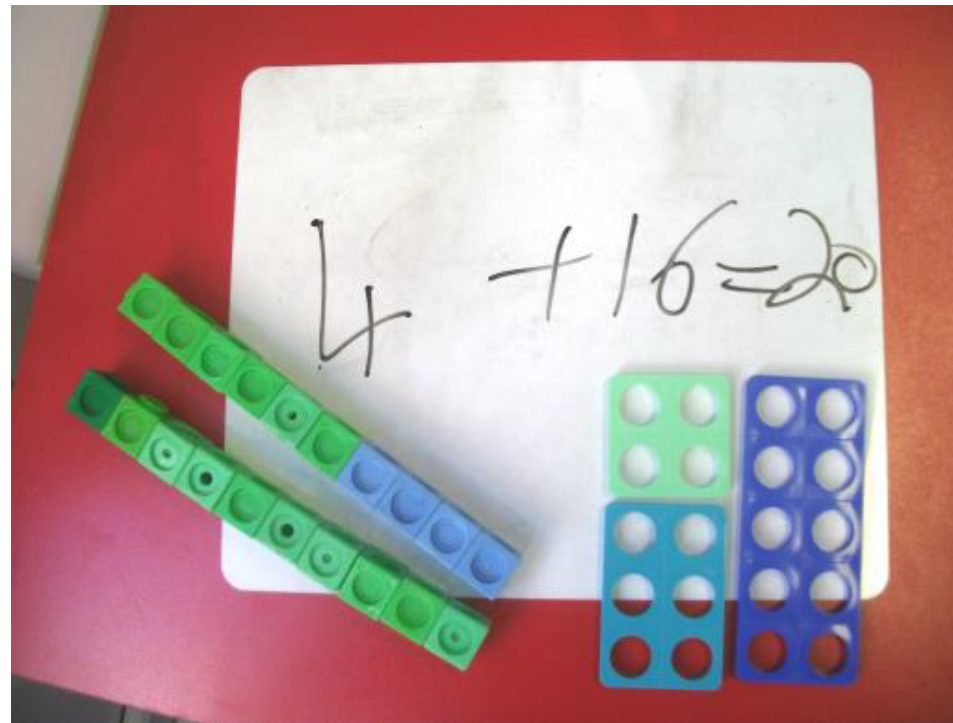
# Addition

- Written methods
- Blank number lines (Example)

- Children also need to understand the concept of equality before using the '=' sign. Calculations should be written either side of the equality sign so that the sign is not just interpreted as 'the answer'.
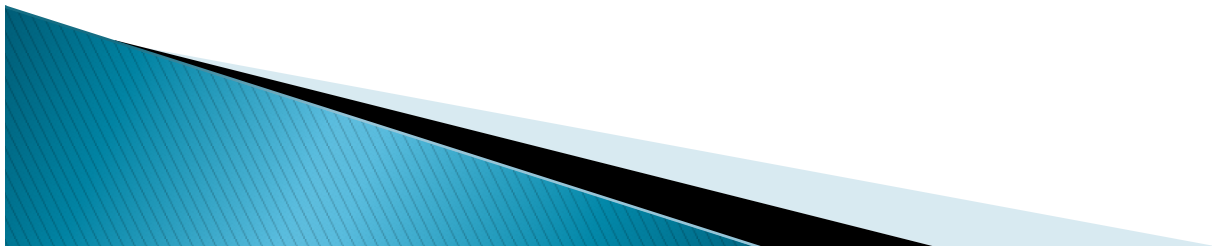- $2 = 1 + 1$
- $2 + 3 = 4 + 1$

# Addition

- Partition into tens and ones and recombine (Example)

- 54 + 23 =

# Subtraction

- Subtraction is the inverse of addition. It can be defined as the process of taking away one number or amount from another, or as the act of finding the difference between two numbers or amounts.
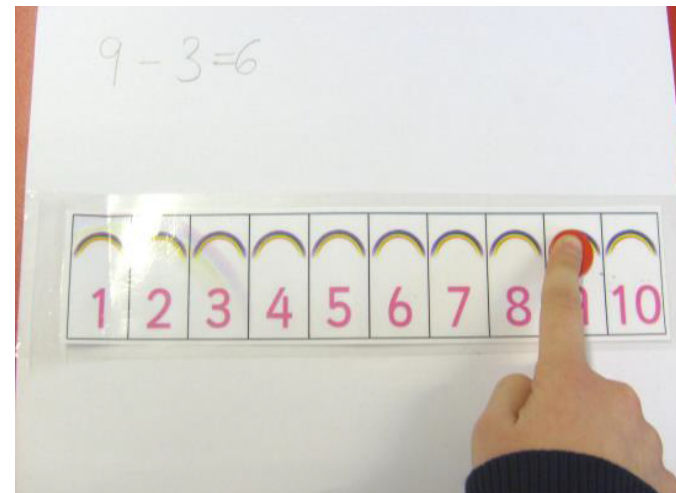
# Subtraction

- Early learning



2 skittles are knocked down.
How many left?
6 – 2 = 4



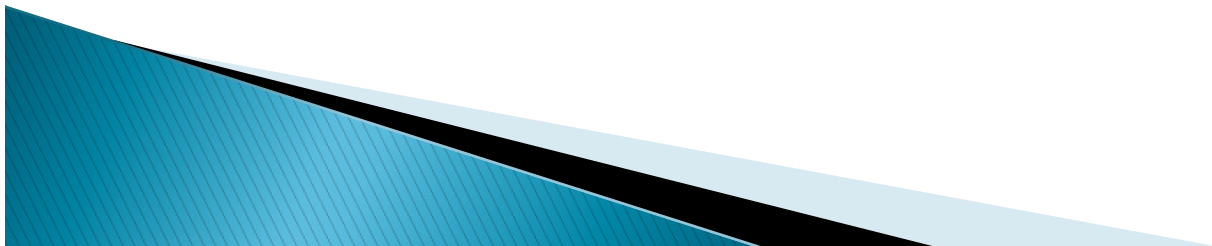How many more green cubes?
How many less black cubes?
5 – 3 = 2

# Subtraction

- Written methods
- Number lines

- Solve problems using number tracks to take away by counting back e.g. 9 – 3 = 6

# Multiplication

▸ Multiplication is the product of two or more numbers or repeatedly adding a number or quantity. For example 4 multiplied by 5 (4 x 5) is 5 groups of 4 or 4+4+4+4+4. It is an inverse operation of division.
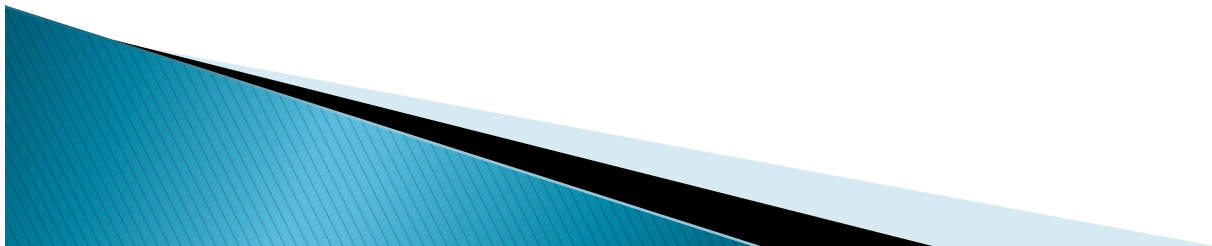
# Multiplication

- Early learning
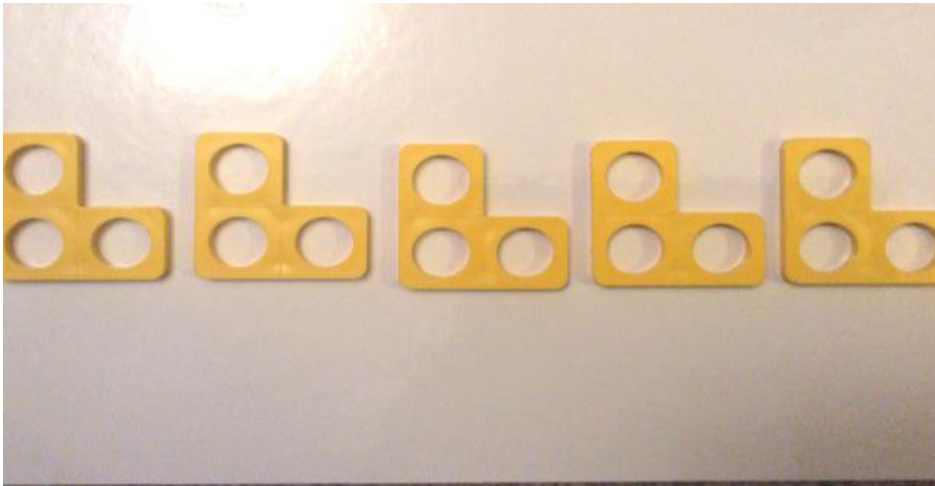- Children need opportunities to count groups of the same number of objects and add them together.
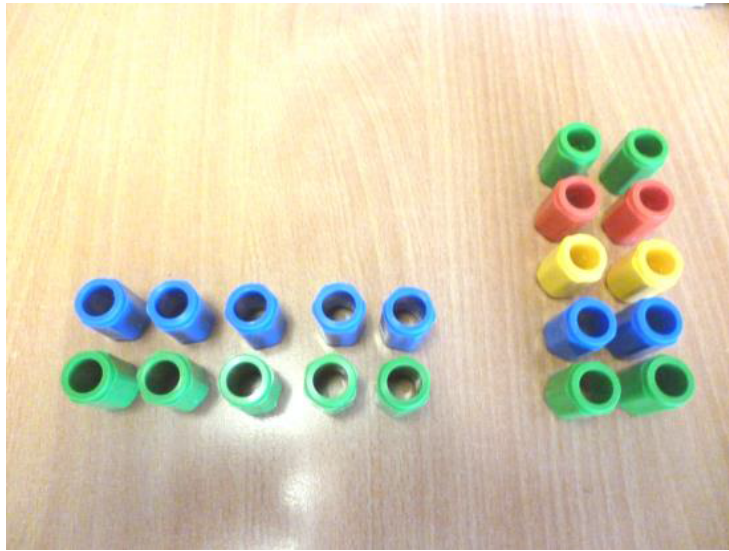
# Multiplication

- Counting forwards and backwards in equal steps e.g. in 2's, 5's and 10's.
- Repeated addition.
- Rapid recall of multiplication facts.
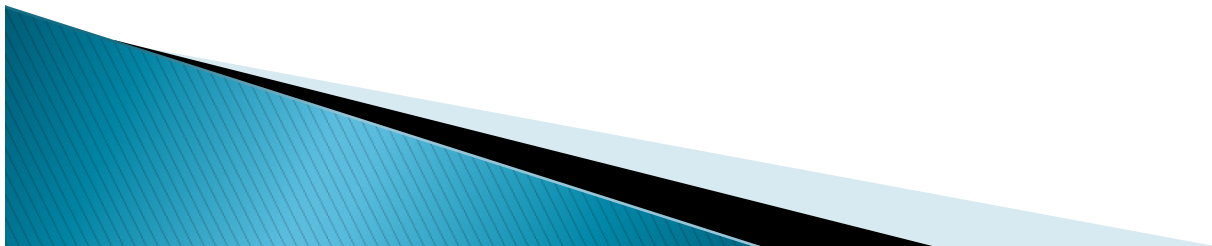- Secure understanding of place value.
- Doubling and halving.
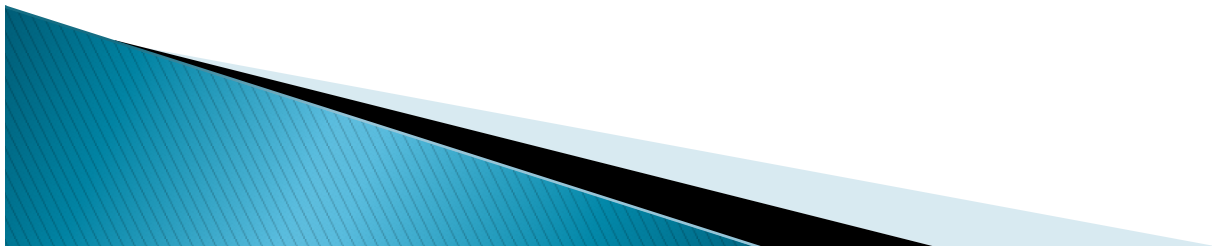
# Multiplication

- Repeated addition.
- 3+3+3+3+3= 15

# Multiplication

▸ Once children recognise multiplication as repeated addition, they can then be taught that multiplication can be done in any order (4 x 2 = 2 x 4).

▸ Arrays (Example)

# Division

▸ Division is the inverse of multiplication and is a way of determining how many times one quantity is contained within another. Either sharing or grouping can divide a quantity.
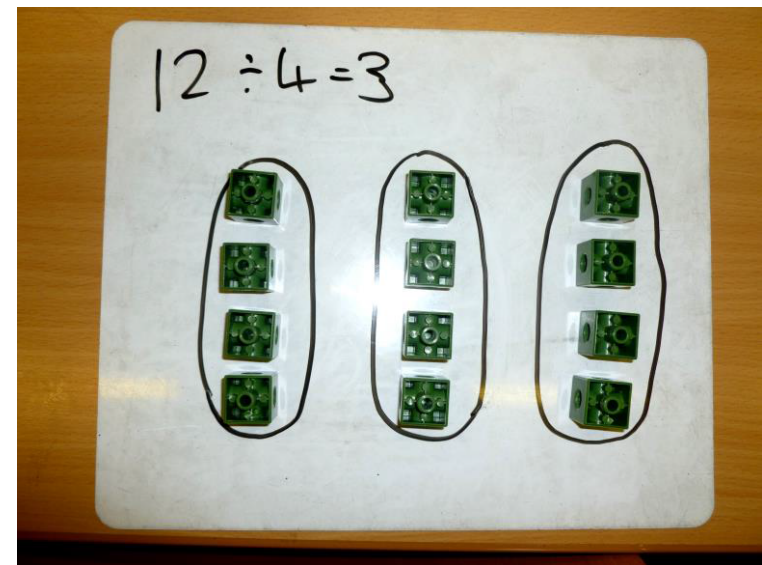
# Division

- Early learning.
- Children can use objects, pictures to solve problems.
- For example, I have 6 beanbags to share between 2 people. How many does each person get? They will learn to share a set of objects equally.
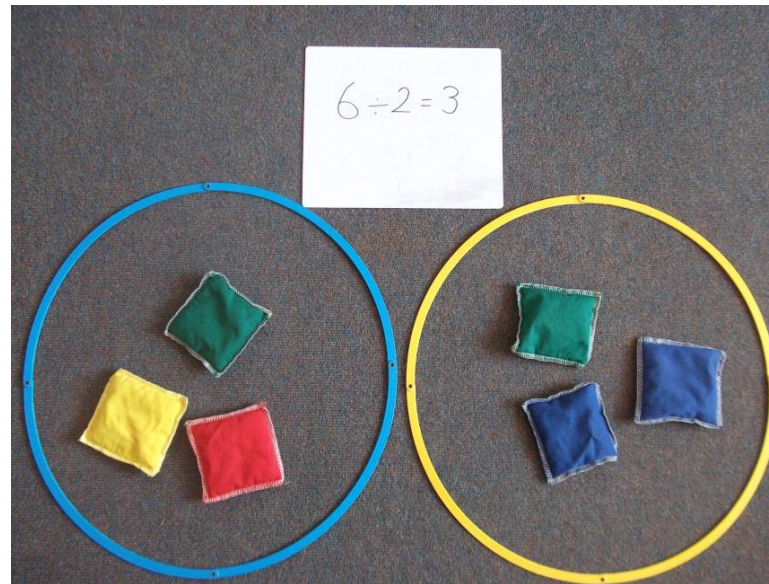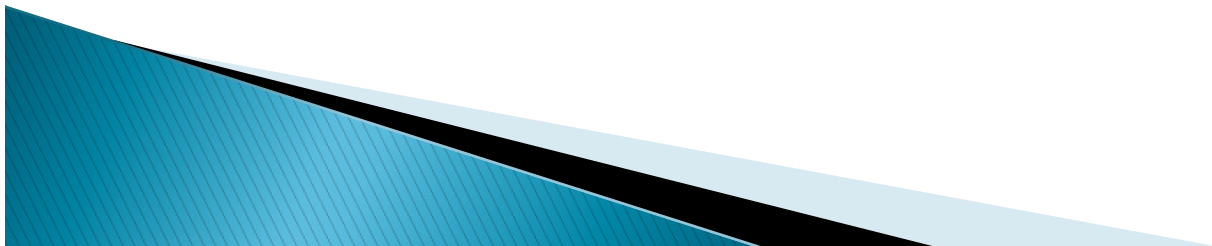
# Division

- Grouping.
- Grouping is knowing how many to start with but not how many groups.
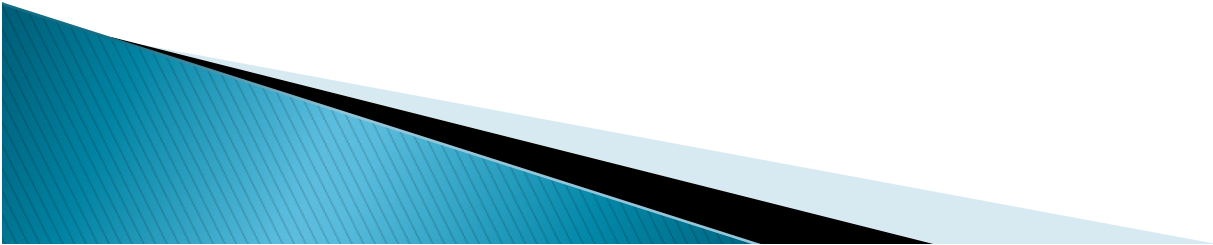- For example, there are 12 cubes. How many groups of 4 can be made?

# Division

- Written methods
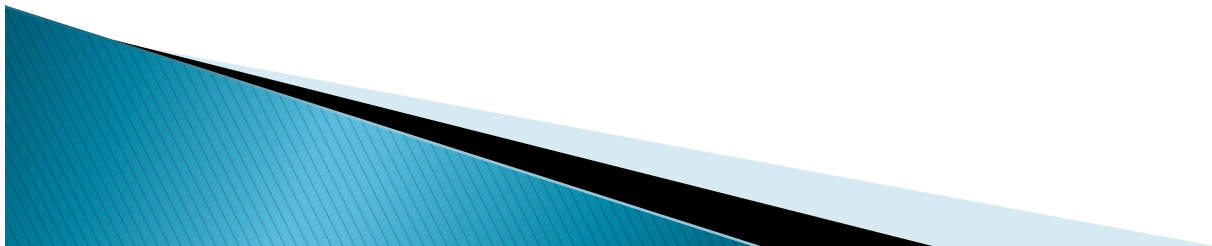- Finding fractions of a number.
- E.g ¼ of 16

- 2/3 of 12

# Programme of study
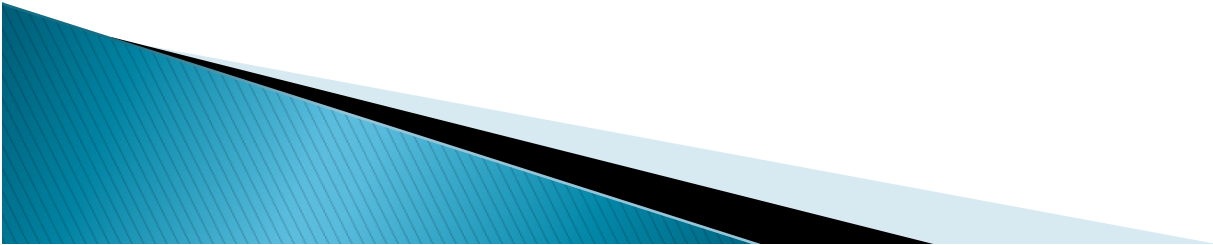
- EYFS
- The curriculum is divided into Numbers and Shape, space and measure.
- Numbers include:
- Recognising numbers
- Counting
- Estimating how many objects
- Comparing sets of objects
- Finding totals of items in two groups
- Say one more
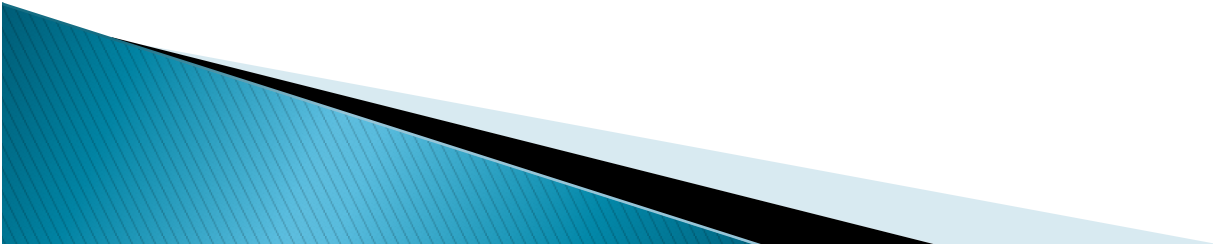- Find one more / less than a group of objects

# Programme of study

- EYFS
- Shape, space and measure includes:
- Naming 3D and 2D shapes
- Selecting a particular named shape
- Describing their position – 'behind', 'next to'
- Order items by weight or capacity
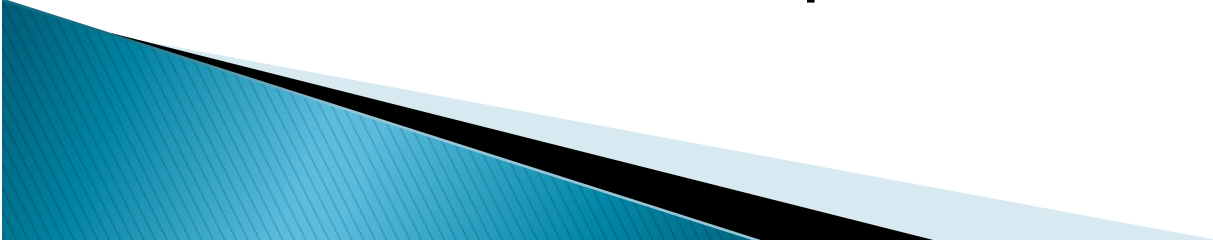- Recreate patterns
- Use everyday language related to time

# Programme of study

- The KS1 curriculum is divided into areas:
- Number
- Which includes:
- Number and place value – read and write numbers to at least 100 in numerals and words
- Addition and subtraction – adding 3 1-digit numbers
- Multiplication and division – recall and use multiplication and division facts for the 2,5 and 10 tables
- Fractions – recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity
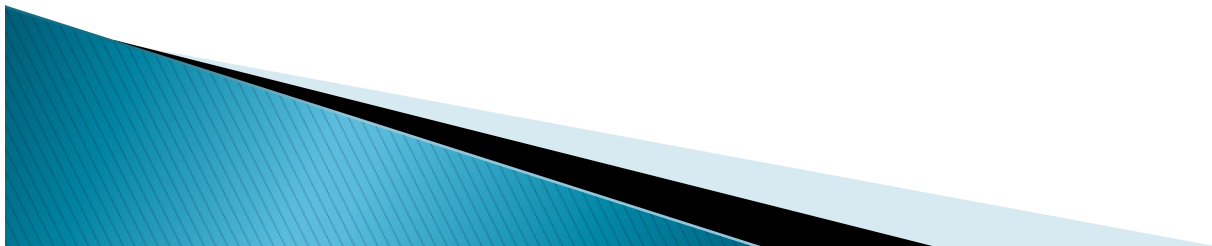- Recognise the equivalence of 2/4 and 1/2

# Programme of study

- Measurements
- Length, height, capacity and volume – using m/cm, kg/g, l/ml and °C
- Mass or weight – compare and order results using $<$, $>$ and $=$
- Time – tell and write the time to 5 minutes
- Money – combine different amounts and find different combinations of coins that equal the same amount of money
- Days of the week
- Months of the year

# Programme of study

- Geometry
- Properties of 2D and 3D shapes, using correct vocabulary – sides, faces, straight, curved, vertices
- Find the number of lines of symmetry
- Position and direction – order and arrange objects in patterns and sequences
- Use mathematical vocabulary to describe position – in terms of right angles for quarter, half and three-quarter turns
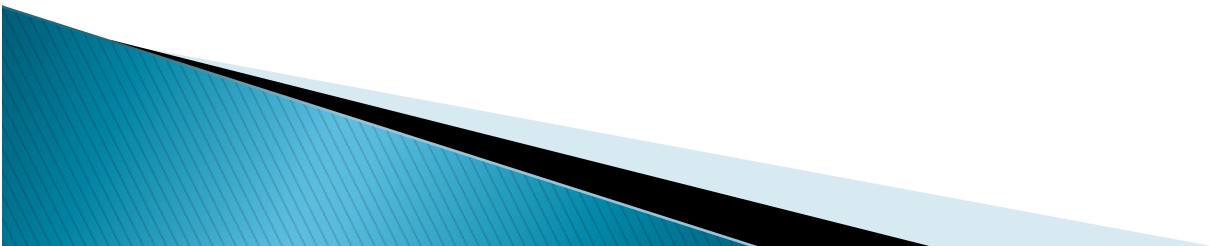
# Programme of study

- Statistics
- Interpreting and constructing pictograms, tally charts, block diagrams and simple tables

# Finally

- If you can do one thing to help your child from today please do not say in front of your child that you do not like Maths or can't do Maths!

- Remember everyone can!

# Any question?