



Beacon Education

Supporting Christian schools worldwide

Mathematics Years 1-4

Kindergarten to Year 3

- Young children need practical hands-on materials.
- You will need to collect and make the resources such as:
 - bottle caps, stones, shells (counters)
 - sticks
 - beads
 - number lines
 - number cards



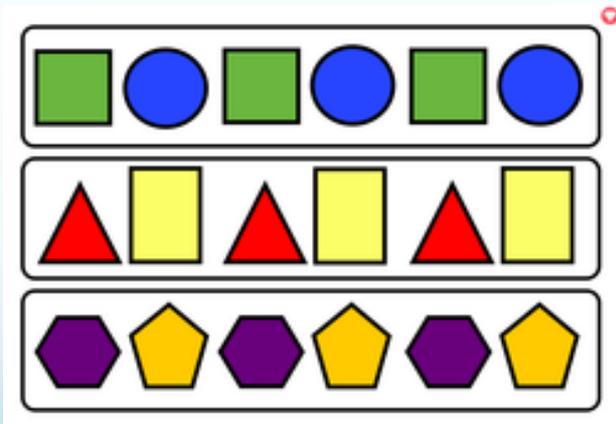


1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

Kindergarten and Year 1

Visual Perception

- Completing patterns



Egg carton for one-to-one correspondence

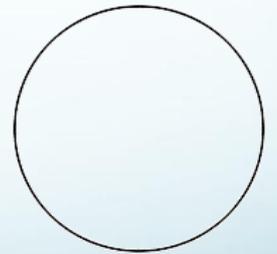
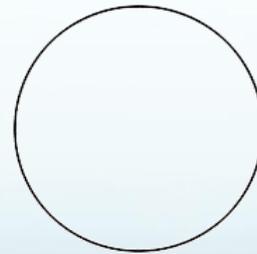
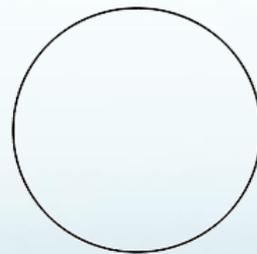
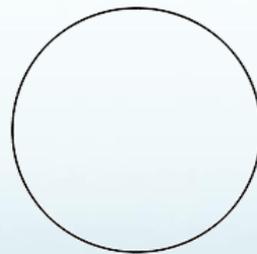
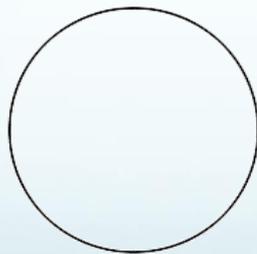
One object in every compartment = one-to-one correspondence



Left to right and one-to-one correspondence, e.g.

Put a stem on every flower

put a smile on every face – start from the star



Bead threading for counting and one-to-one correspondence



Mathematical language

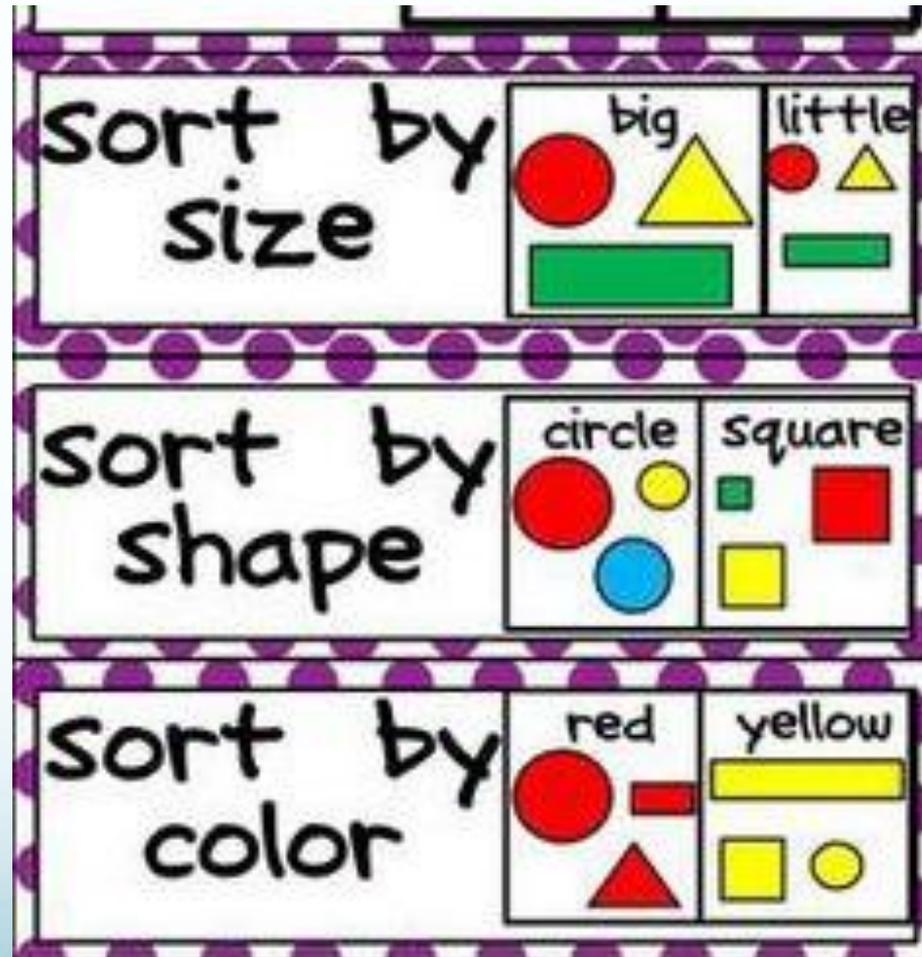
- **big / little**
- **large / small**
- **tall / short**
- **up / down**
- **over / under**
- **wide / narrow**
- **more / less**
- **left / right**
- **more / less**
- **top / bottom**
- **beside / between**
- **front / back**
- **thick / thin**
- **wide / narrow**
- **before / after**
- **above / below**
- **in / out**
- **high / low**
- **heavy / light**
- **full / empty**

Activity to reinforce mathematical language

Instructions for a drawing:

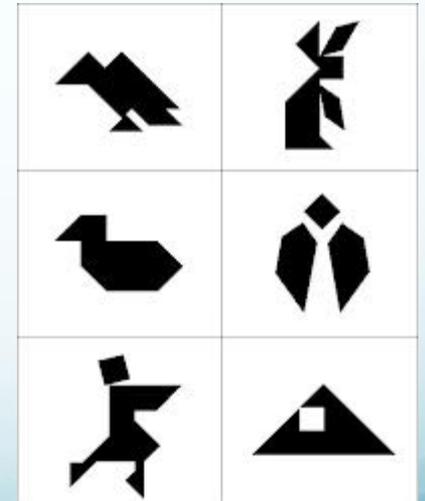
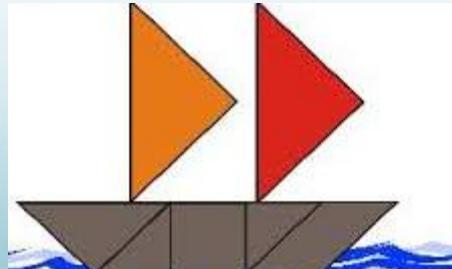
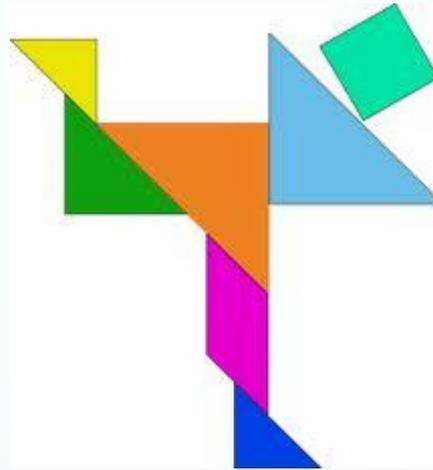
- Draw a tree on the *left-hand* side of your page.
- Draw a *small* bird at the *top* of a *tall* tree.
- Draw a river at the *bottom* of the page.
- Draw a man with a *long* fishing line.
- Draw a *big* fish on the end of the line.

Sorting activities



Shapes

Tangrams



Counting and numbers to 10

Preschool and Year 1

- Counting rhymes and finger plays
- Bottle tops – e.g. put 7 bottle tops in a line
- Egg cartons with numbered compartments



Hop Scotch



Examples of activities for counting from 1 to 10

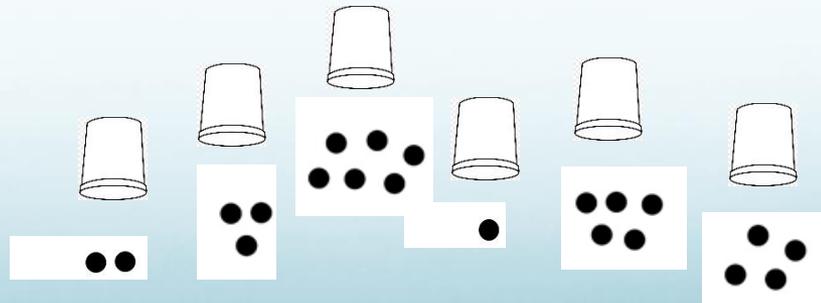
Ask students to:

- Draw 3 trees, 5 dogs, 7 cats etc.
- Count and walk along a large number line.
- On the spot actions – 6 jumps, 7 hops, 5 squats
- Count backwards from 10 (rocket blast off)



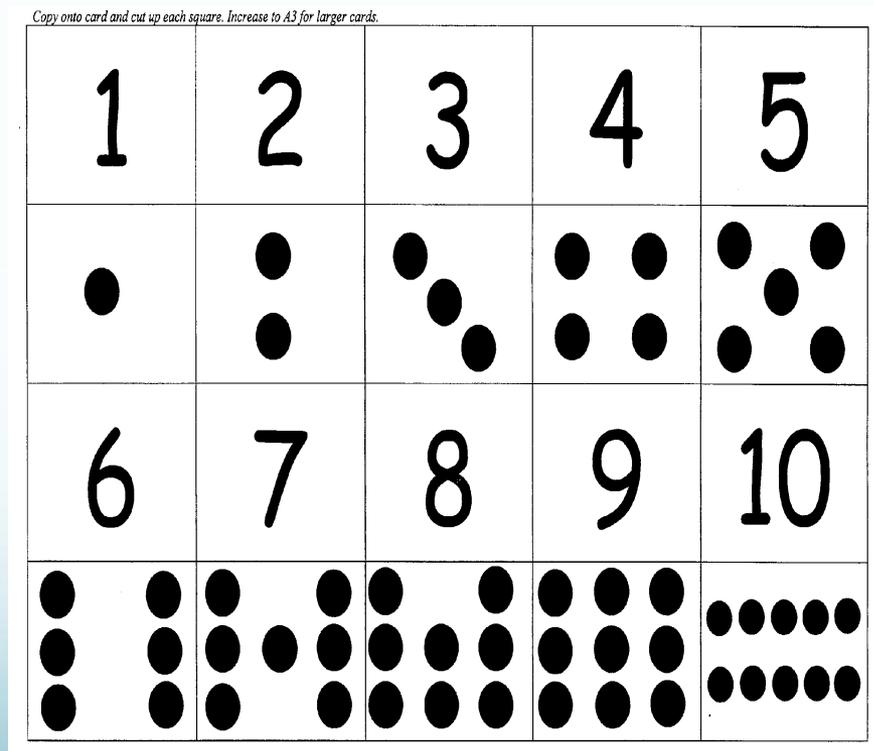
Game – for counting up to 6

- Take 6 cups or containers, (all the same).
- While children close their eyes, you hide stones under the 6 cups.
- Chose a child to come up and you say, "Find the cup that has e.g. 5 stones."
- When they find it, switch the cups around. Call another child.



Number recognition

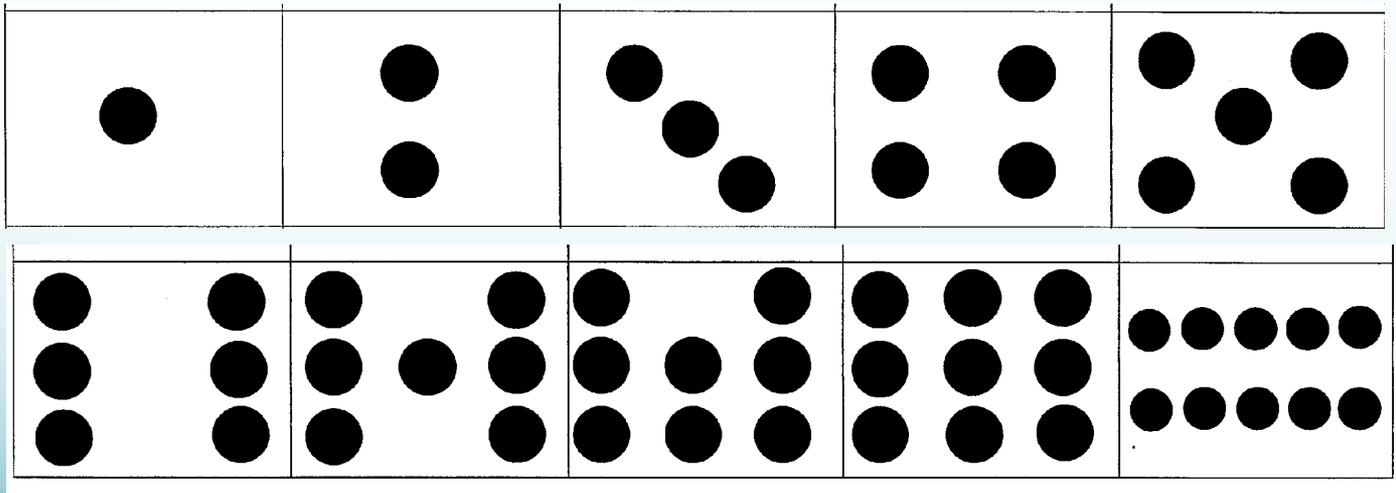
- Practice number recognition and match with dots of the same number. Cut up and make small cards:



Game: Quick as a flash

Make individual dot cards.

Hold them up one at a time. The children have to quickly say the number of dots. Then quickly flash to the next card.



Spinners

- Spinners can be used instead of dice. Cut out this 6-sided shape and inset a match stick in the centre.



Counting from 1 to 20

- Extend the number line to 20.
- **The number in-between:** Ask students to touch the number between e.g. 18 and 20.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

Also ask them for:

- The number before
- The number after

Ordinal number

- e.g. Colour the 6th hat; 4th flower; 9th fish etc.
- Or physically place objects or people in order.



1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th

Beads on a string

Arrange beads in 5s so that students can count in 5s or 10s.



Give instructions – “Find e.g. 18.”



Mathematical operations

- **Addition**
- **Subtraction**
- **Multiplication**
- **Division**

Beginning Addition and Subtraction – K and Yr 1

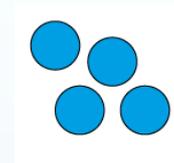
- One more than ...
- One less than ...
- The number after ...
- The number before ...

Addition activity

- Roll a die.

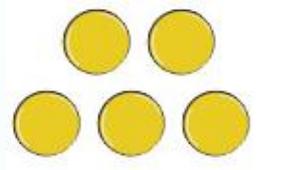


- If you get 4, put out 4 counters
- Roll the die again.
- If you get 6, put out 6 counters.
- How many counters altogether?



Adding more

- Set out a certain number of counters (under 10)



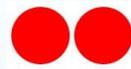
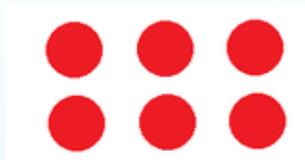
- Ask students to add e.g. 3 more.



- Now how many altogether?

Solve problems using 'and'

- Start solving equations using the word '*and*' rather than '*plus*' (also, don't use the + sign yet.)
- *6 and 2 makes ?*



Number line for addition & subtraction

- Make a large number line that students can walk along.



- Say “Stand on 5.
5 and 2 more makes ...?”

For subtraction the students walks the opposite way.

- Say, “Stand on 7. 7 take away 2 makes...?” (The student steps back 2)

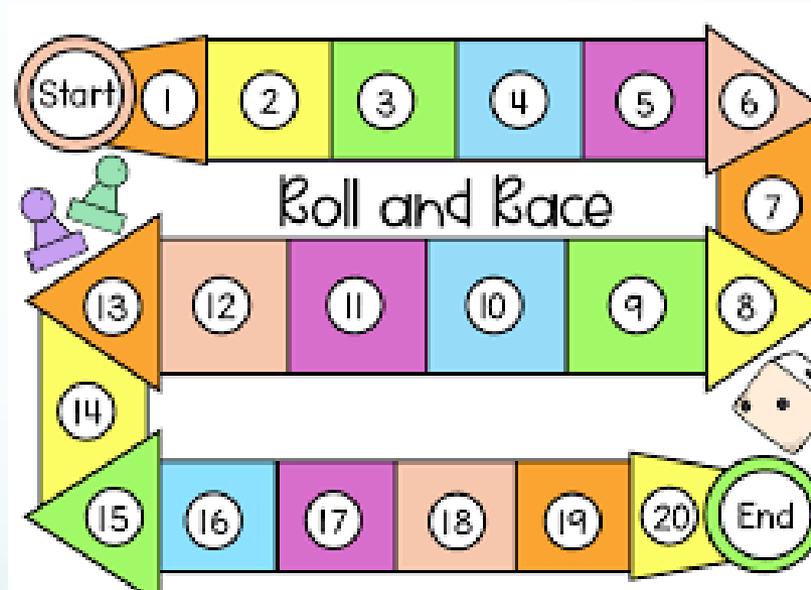
Small number lines

- Addition and subtraction problems using small table-size number lines.
- Teach 'counting on' – They do not count the number they start on.

1	2	3	4	5	6	7	8	9	10
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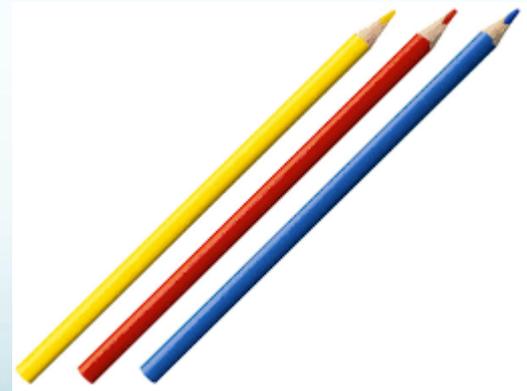
Board game

- Board game with dice to teach 'counting on'



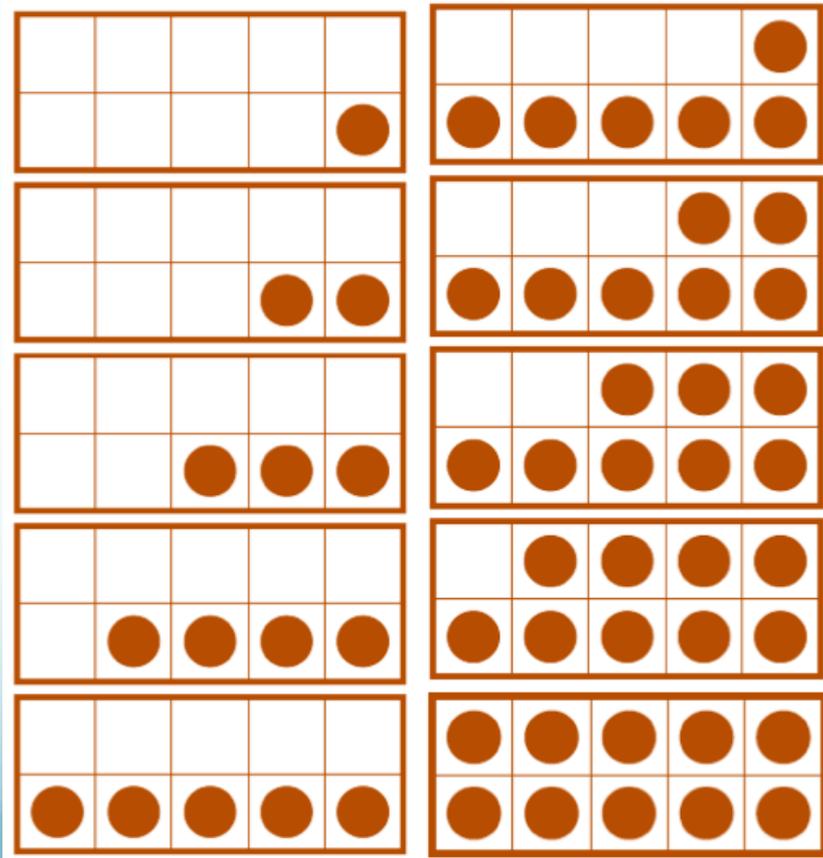
Subtraction – Some went away

- Ask students to put out e.g. 8 counters.
- Now take 5 away.
- How many left? *8 take away 5 makes 3*



Tens Frames

- For number facts of 10.



$$1 + ? = 10$$

$$2 + ? = 10$$

$$3 + ? = 10$$

$$4 + ? = 10$$

$$5 + ? = 10$$

$$6 + ? = 10$$

$$7 + ? = 10$$

$$8 + ? = 10$$

$$9 + ? = 10$$

$$10 + ? = 10$$

Tens Frames

6 + ? = 10

? + 1 = 10

10 = ? + 4

2 + ? = 10

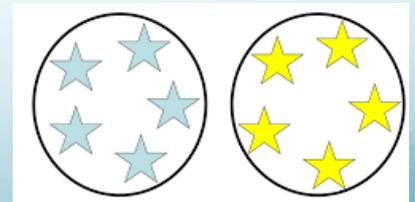
4 + ? = 10

10 = 2 + ?

The image shows six rows of math problems on lined paper. Each row consists of an equation and a corresponding tens frame. The tens frames are 10 boxes long. In the first row, the first 6 boxes are shaded orange. In the second row, the last 1 box is shaded orange. In the third row, the last 4 boxes are shaded orange. In the fourth row, the first 2 boxes are shaded orange. In the fifth row, the first 4 boxes are shaded orange. In the sixth row, the first 2 boxes are shaded orange. The missing numbers in the equations are highlighted in yellow boxes.

Introduction to Multiplication - Year 1

- Begin by teaching students about “sets” or “groups”.
- What comes in sets? *pencils, teeth*
- What comes in groups? *animals, people*
- Ask them to make a group of toys.
- Now ask them to make a group of counters, e.g., a group of 5
- Extend this to making 2 groups of 5



Counting Year 2

- NUMBER CHART to 50. Use it to count by ones, twos, fives, and tens.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Extend the number chart to 100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

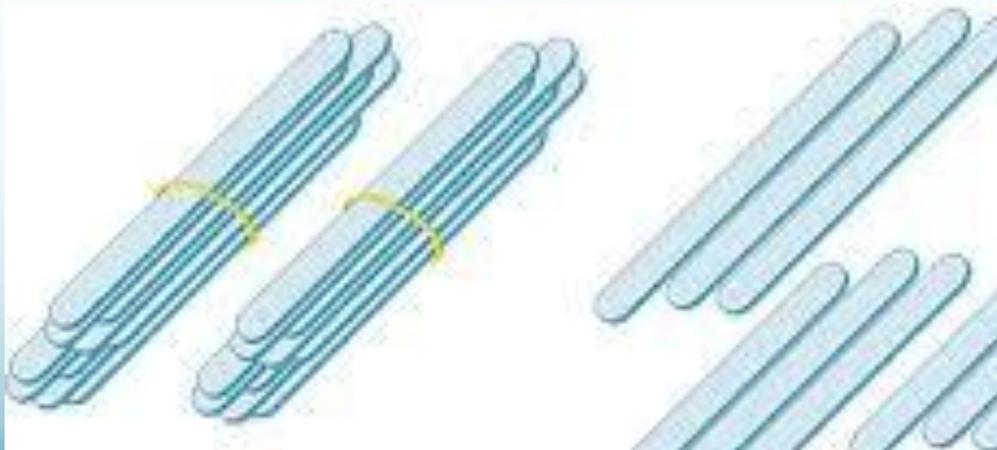
Year 2 Activities

- Students will learn to read all digits to 100
- Which number comes before / after, on the number chart?
- Make number cards 1-50. Select 5 number cards. Ask students to arrange them from lowest to highest, or highest to lowest.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

Bundles of sticks for place value

- Bundle sticks in tens with rubber bands. Also have a supply of single sticks.
- You can call a number between 10 and 99, and the student has to make it with sticks.



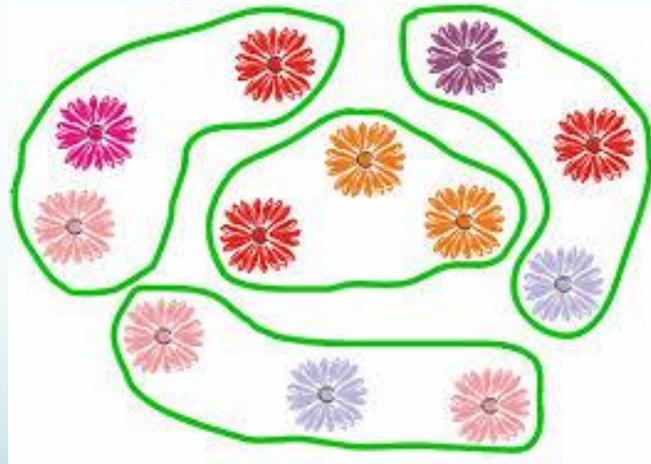
More activities for Year 2

- Word numbers to twenty
- Words for twenty, thirty, forty, fifty, sixty, seventy, eighty, ninety
- What is “equal”? Introduce the = sign
- Introduce the plus and minus signs
- Adding 2: e.g. 2 more than 29; taking away 2
- Board games with numbers to 100
- Use the 100s chart for addition and subtraction.

Multiplication

Children begin understanding multiplication by making groups.

e.g. 2 groups of 4; 3 groups of 3 – How many altogether?

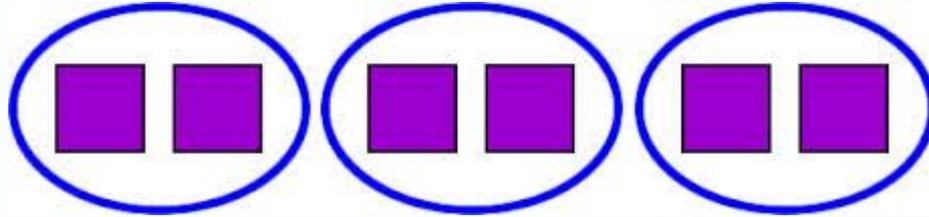


Multiplication

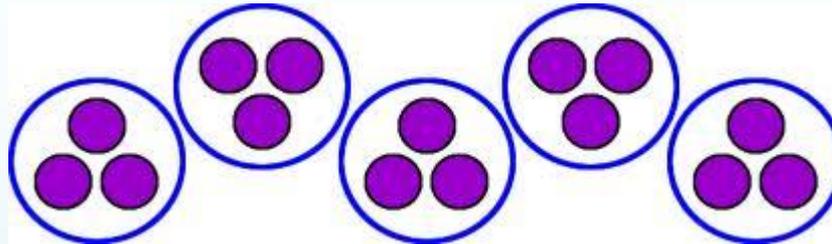
- Use concrete materials to make sets.
- e.g. 3 sets of pencils with 4 in each set.

This is written as **3 sets of 4** and later, **3 x 4**





3 sets of 2 = 6



5 sets of 3 = 15

Multiplication with animal legs

Examples: (Students can draw the following)

- 3 birds, how many legs? 3 sets of 2 =
- 4 horses, how many legs? 4 sets of 4 =
- 5 insects, how many legs? 5 sets of 6 =
- 3 spiders, how many legs? 3 sets of 8 =
- 2 crabs, how many legs? 2 sets of 10 =

Division

Division is the opposite of multiplication.

Ask students to take e.g. 15 counters.

How many groups of 5 can you make?

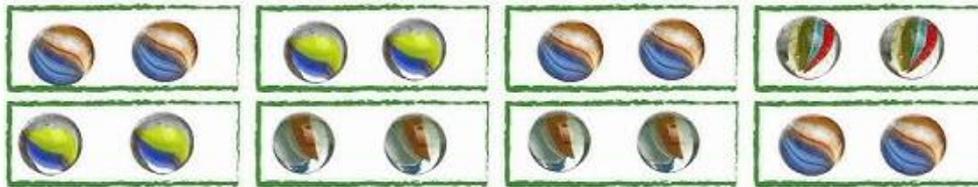
Yes 3 groups of 5.

15 *how many* 5s is 3.



Division is sharing

- You have 16 marbles. There are 8 children.
- Share the marbles between the 8 children.
- How many each?



- You could physically do this with 8 children, and ask one student to share out 16 objects.

Activity

Draw sets of buttons as follows:

4 sets of 3 =

2 sets of 5 =

Draw 20 bananas. Draw circles around groups of 4.

20 how many 4s =

Draw 12 buns.

Share them between 4 children. How many each?

Year 3 Counting

- Counting by ones, twos, fives and tens (Yr 2 work)

Now extend to:

- Counting by 3s to 36
- Counting by 4s to 48
- Counting by odd numbers to 99
- Counting from various starting points
- Counting backwards from 100

Odd and even numbers

Even Numbers

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

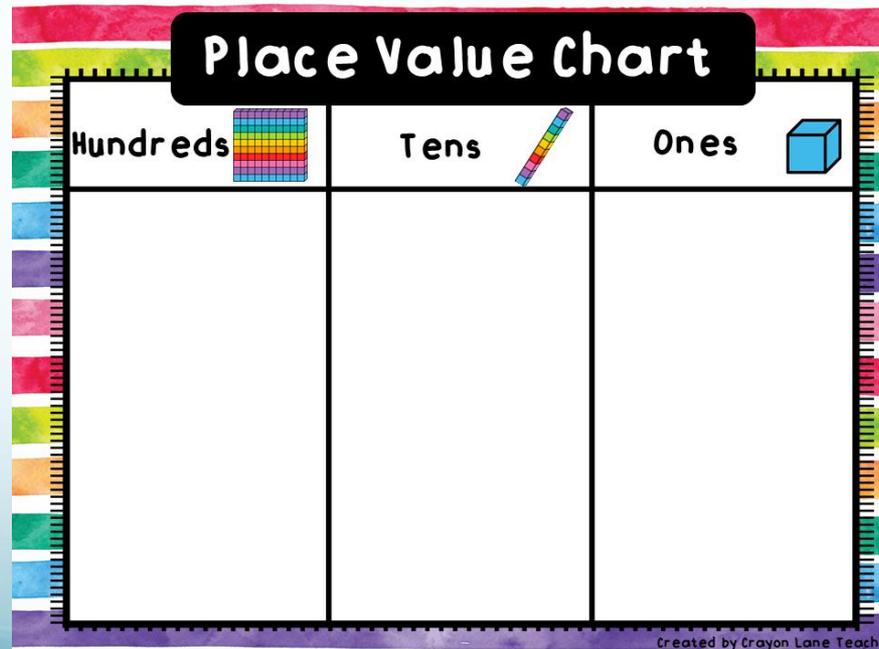
Addition activities for Year 3

On the number chart:

- Add 10
- Add 9
- Take away 10
- Take away 9

Place Value

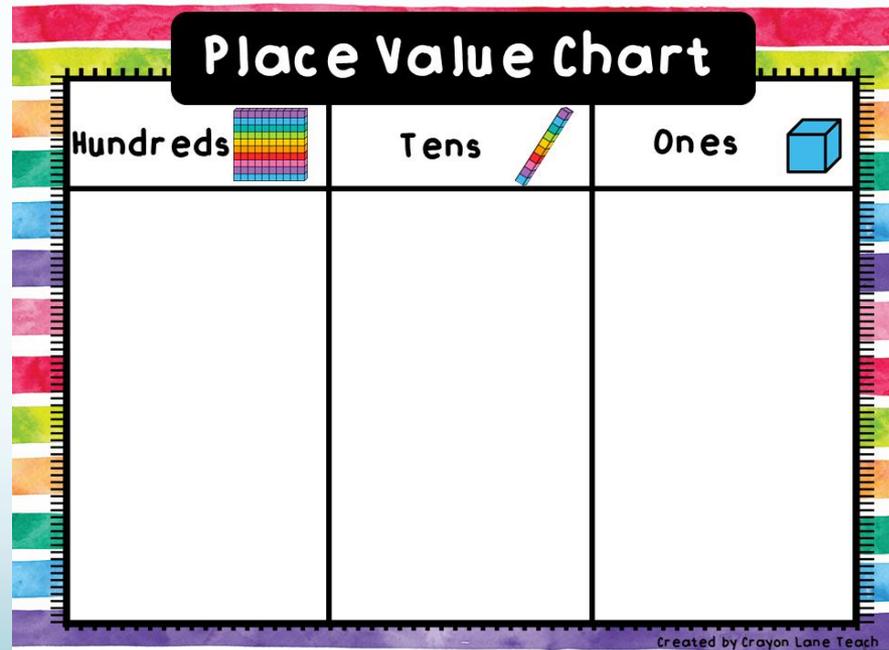
- Start by getting the students to break up numbers into hundreds, tens and ones.
- e.g. $652 = 6 \text{ hundreds, } 5 \text{ tens and } 2 \text{ ones}$



Activity

- Draw three columns for Hundreds, Tens, Units
- Practice adding the following using the chart:

$$126 + 243$$

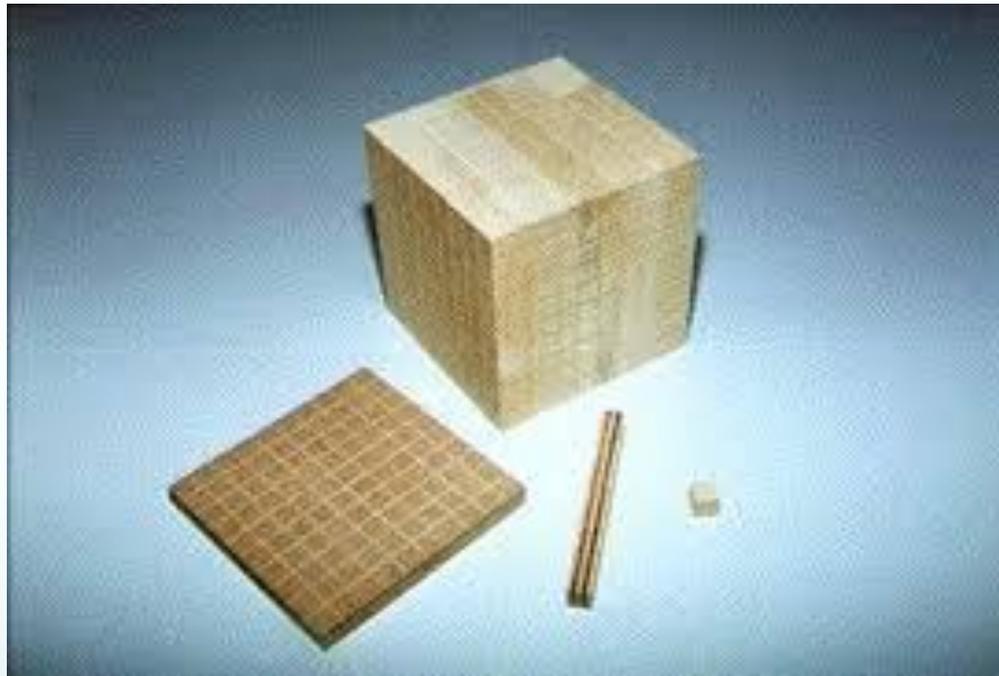


A place value chart with three columns: Hundreds, Tens, and Ones. The chart is decorated with a colorful border and a ruler-like scale on the left and right sides. The title "Place Value Chart" is written in white on a black background at the top. The "Hundreds" column is labeled with a 10x10 grid of small squares. The "Tens" column is labeled with a single vertical bar of 10 small squares. The "Ones" column is labeled with a single small square. The chart is currently empty.

Hundreds	Tens	Ones

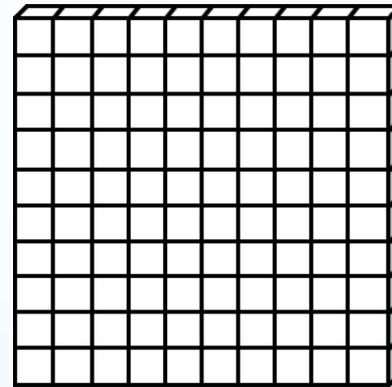
Created by Crayon Lane Teach

Place value



Resources for place value

- If you don't have the wooden blocks, you can use pictures of the blocks (print, laminate and cut).



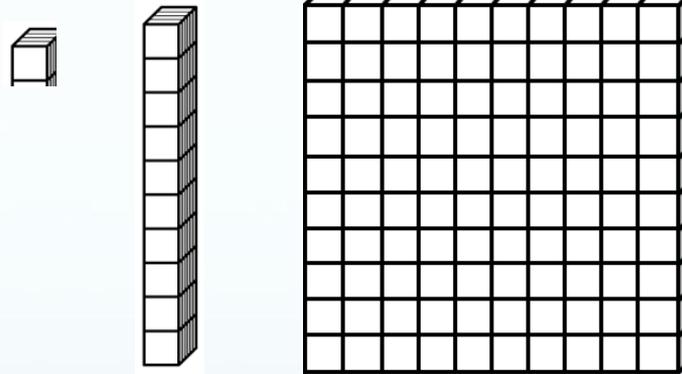
- Students will now read and write 3-digit numbers

Activity

- Use the hundreds, tens, ones print-outs to solve the following equations:

$$231 + 45 =$$

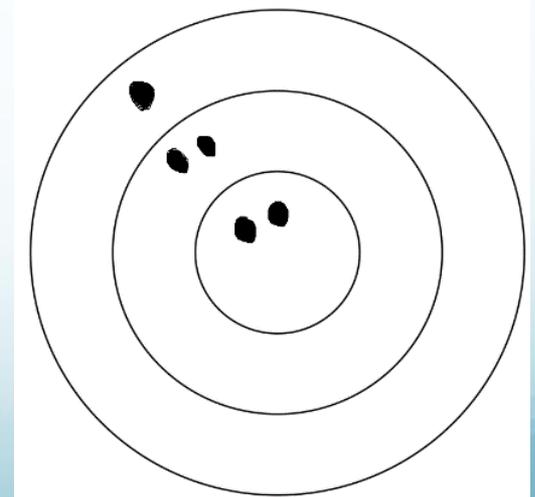
$$554 - 32 =$$



Find these cut-out resources on www.beaconmedia.com.au –
Primary mathematics

Target game for Place Value

- Make a large target on paper and place on the floor.
- Give each player 5 stones.
- One at a time, students have to throw stones into the rings and say the number they have made.
- See who gets the highest number.
- Centre circle = hundreds; middle circle = tens, outer circle = ones



Extended notation

- Helps children understand place value

EXAMPLES:

- $97 = 9 \text{ tens} + 7 \text{ ones (or units)}$
- $364 = 3 \text{ hundreds} + 6 \text{ tens} + 4 \text{ ones}$

Extended notation

EXAMPLE:

$$\begin{aligned}26 + 32 &= 20 + 6 + 30 + 2 \\ &= 20 + 30 + 6 + 2 \\ &= (20 + 30) + (6 + 2) \\ &= 50 + 8 \\ &= 58\end{aligned}$$

Activity

Try solving this example using extended notation:

$$154 + 642$$

Speed addition chart

- How fast can the student fill out the chart?
- The same can be used for times tables

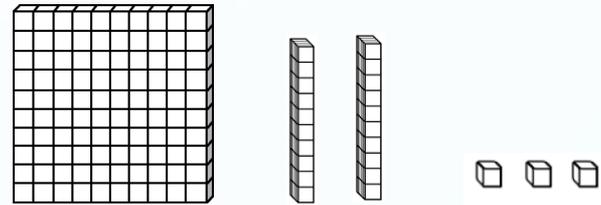
+	2	3	4	5
2				
3				
4				
5				

Multiplication with equipment

e.g. 123×3

First set out as:

- 1 hundreds chart
- 2 tens
- 3 units



Now set out 3 of each on the table or floor

Division

Division and multiplication – reverse operations

Use equipment to show:

$$5 \times 2 = 10 \text{ (multiplication)}$$

Then in reverse:

$$10, \text{ how many } 2\text{s} = 5 \text{ (division)}$$

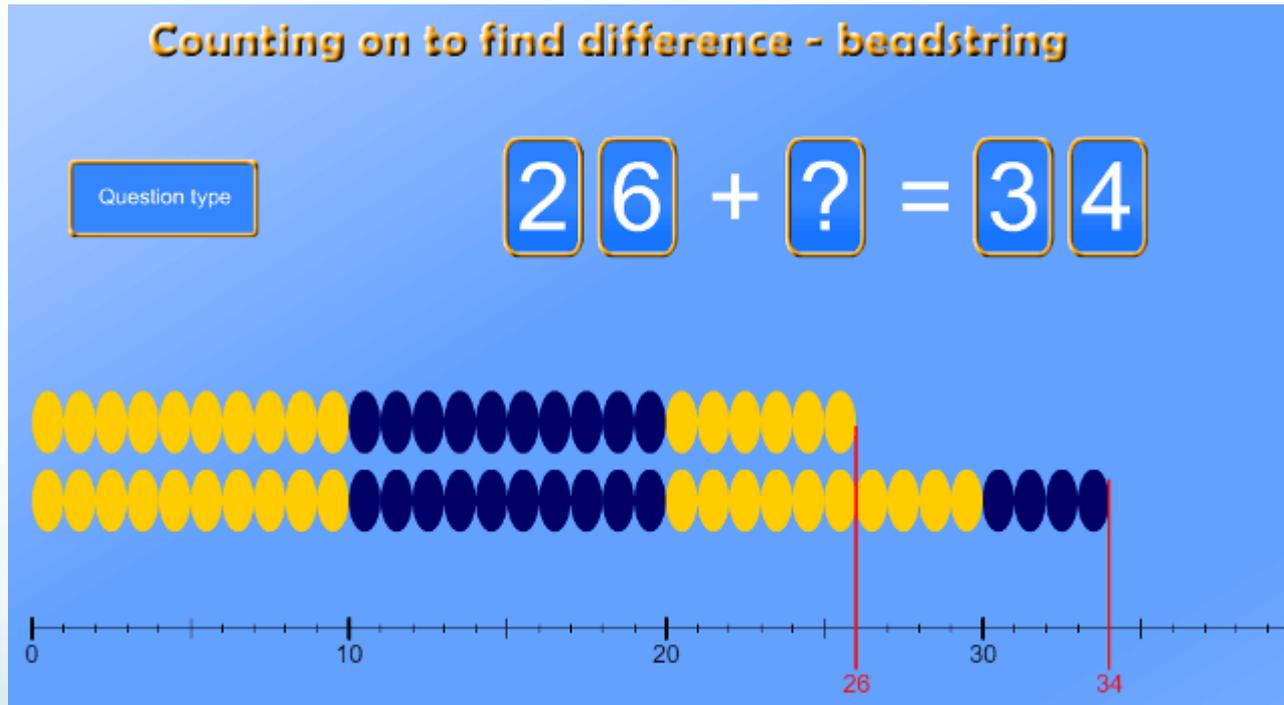
(Later the “how many” can be substituted for the sign)



More activities for Years 3 & 4

- Number facts to 10
- Number facts to 20
- Doubling
- Halving

Find the missing number



Making multiplication equations

- The students draw a tray of 12 cookies, 4 by 3
- How many different multiplication equations can they make from these?

$$3 \times 4 = 12$$

$$4 \times 3 = 12$$

$$6 \times 2 = 12$$

$$2 \times 6 = 12$$

$$1 \times 12 = 12$$

$$12 \times 1 = 12$$



Try the same with 16 or 20

Times tables

- To be learned in this order:
- X2
- X10
- X5
- X3
- X4
- X11 (x6, x7, x8, x9 can be learned later)

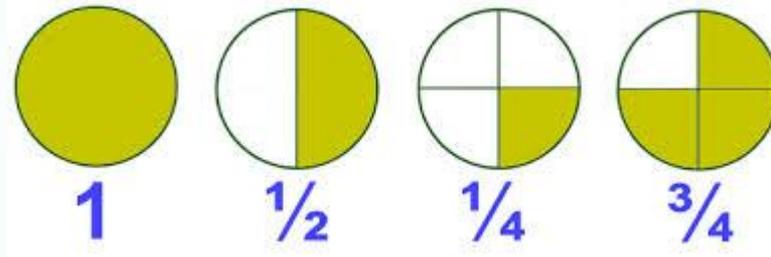
Problem solving

Verbal problems to be solved mathematically

e.g. A man went to the shop and bought 2 litres of milk for \$1 per litre and half a kilo of oranges for \$2 a kilo. How much did he spend?

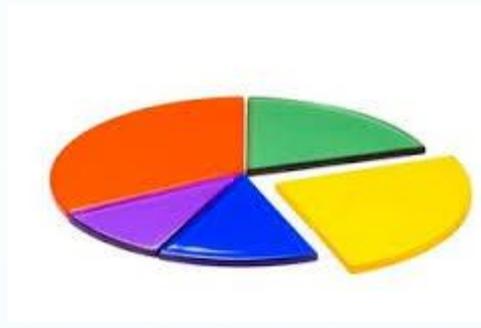
Fractions

- Whole, halves, quarters



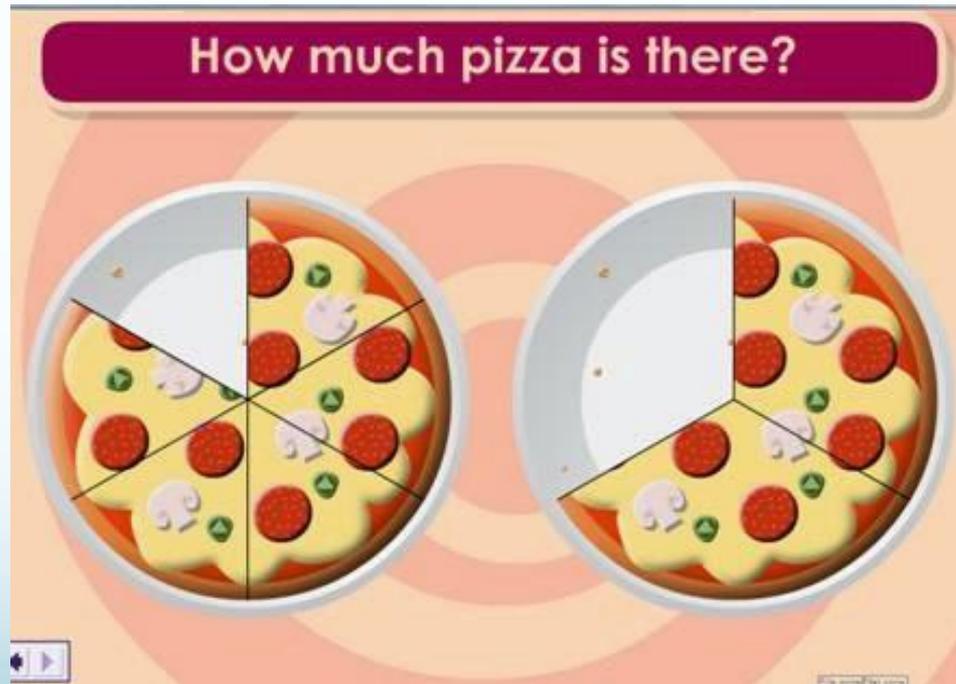
Fractions

- Quarters and eighths

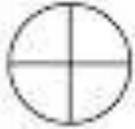


Fractions

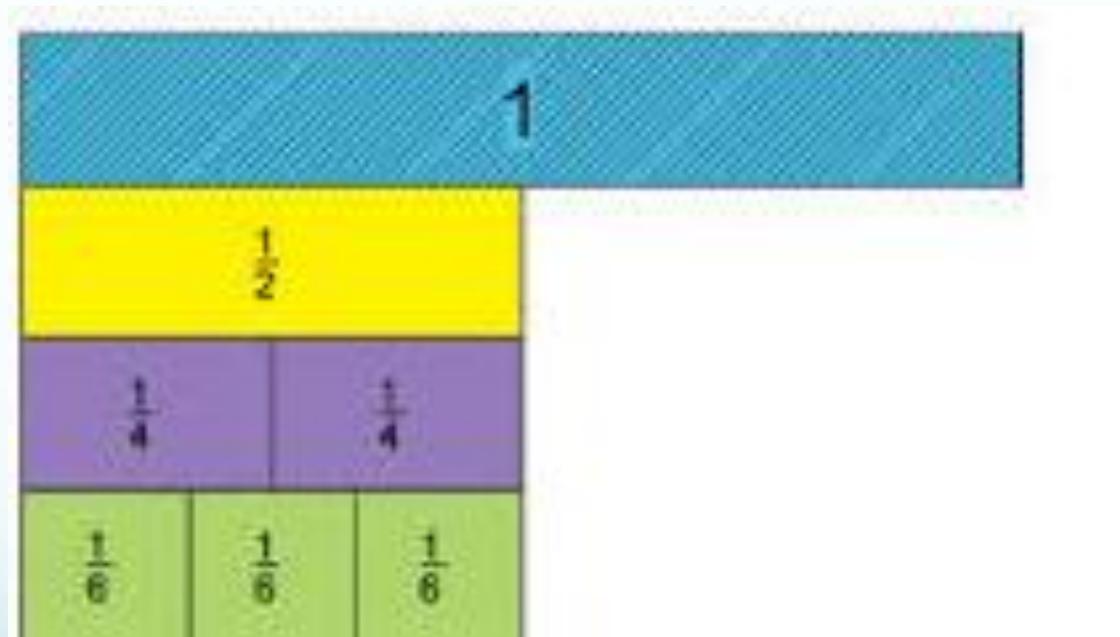
Thirds and sixths



1 part out of 4 is one quarter
1 part out of 3 is one third etc.

Fractions	
 Color $\frac{1}{4}$	 Color $\frac{2}{5}$
 Color $\frac{1}{3}$	 Color $\frac{1}{5}$
 Color $\frac{2}{4}$	 Color $\frac{3}{4}$
 Color $\frac{2}{3}$	 Color $\frac{4}{5}$
 Color $\frac{3}{5}$	 Color $\frac{1}{2}$

Fractions chart



Applied mathematics (all year levels)

- Time
- Weight
- Distance
- Capacity
- Money

Money

Two lessons from wise sayings in the Bible:

- “For where your treasure is, there your heart will be also.” (There are other things in life that are more important than money. Don’t make money an idol.)
- “Don’t be lazy. Take a lesson from the ant who gathers food in the summer so that she will have enough for the winter.” (Work hard and save up your money to provide for the needs of you and your family)

Money

- Start in kindergarten and Year 1 by setting up a “shop”.
- Use counters with numbers on them to buy and sell.
- In Years 2 – 4, create practical problems, e.g. I bought 3 ice-creams for \$1.50 each. How much did I spend?

Time

We see this in:

- Before, After,
- Sequence of Events
- Daily Schedules
- Seasons
- Hours, Minutes and Seconds
- Perfect Spinning of the Planet

Months in a Year
Weeks in a Month
Days in a Week
Hours in a Day
Minutes in a Hour
Seconds in a Minute

Teaching time

- In kindergarten, children start by learning what time they get up, go to school, have lunch, go home, go to bed
- How long is a second? Count how long it takes to do a task, in seconds.
- Make an “egg timer”. How long does it take for the bottle of sand to empty?



Time

- For younger children, teach analogue time by using a large clock face with moving hands.
- For Years 2-4, provide clock faces on paper that students can use to mark in specific times.
- Years 3 and 4, teach digital time.

Measurement

- Length, width, height, depth, weight
- Measurement can also be applied to moral standards. We measure right against wrong, honesty against dishonesty.



Measurement

- Start in kindergarten and Year 1 with using informal measuring units.
- A pencil – how many pencils long is this piece of cardboard?
- Students' own feet – How many footsteps long is this piece of board?
- By Year 2, progress to using a ruler to measure things in centimeters. Have a meter long ruler (make one) to measure longer things such a room.

Capacity

- How much does something hold?
- Start in kindergarten with experimenting with filling different sized containers, e.g., it takes 4 small cups to fill the jug. From Year 2 up, teach liters and milliliters.



Weight

- Kindergarten and Year 1 - Make your own beam balance.
- Years 2 – 4 – Children can become familiar with weights by using kitchen scales in cooking activities.



Beacon Media Mathematics Resources

Levelled Maths Cards – Kindergarten to Year 6

- One card per week
- The teacher makes up similar examples for the other days, within the framework of the curriculum
- Find **Levelled Maths Cards** on www.beaconmedia.com.au – Primary Mathematics

Testing Mathematics

- A test should be given in mathematics at the end of each term. This test is the last activity for each level on the **Levelled Maths Cards** (Years K-6).
- For Kindergarten and Year 1, the students will probably not be able to read the instructions. The teacher or teacher's aide will work one-on-one with the student to give an oral test.

Maths program for students who are not up to standard

- This is a program for a small group, called “Maths for Greater Understanding”.
- Teachers can use some of these activities for the classroom.
- Find these activities on www.beaconmedia.com.au – under Support Programs in Literacy and Numeracy

Questions

1. Why do you think it is important for young children to use practical, hands-on equipment for beginning mathematics?
2. Give examples of some practical equipment.
3. What activities can you do with a number line 1-20?
4. What activities can you do with a number chart 1-100?
5. Explain how you would teach addition and subtraction in Year 1.
6. Explain how you would teach multiplication and division in years 1-3.
7. List some activities to teach Place Value.
8. What is extended notation? Give an example.
9. What is the order of teaching times tables?