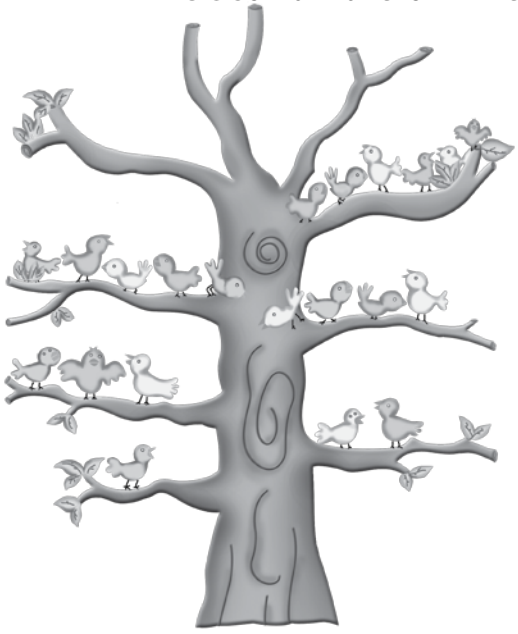
introductory Book Two

MATHS WISE

Teaching Guide

Second Edition with lesson plans



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Introduction

A. The *Maths Wise* series

When human beings lived in caves, their only teacher was nature. Man discovered various aspects of counting and of working with numbers from his own body, plants, and animals in his environment. Knowledge of shapes, and modes of travel were also guided by nature. This knowledge, along with other values, remained with man and was later formalized and termed 'education.'

Three-year olds come to their new school surroundings from the warmth of their homes, unsure of what to expect. Everything is new—class fellows, the teacher, the books, the sounds, the ringing of the school bell, and all need a lot of getting used to. The main objective of *Maths Wise*, therefore, is to develop a sense of security by making use of objects that children are already familiar with such as plastic or cloth soft toys, and plastic dishes.

If the teacher presents the lessons in an interesting, practical, and fun manner, learning becomes a game. New concepts should be introduced in a warm, cheerful, and friendly manner. Children who have difficulty learning through memory initially can enjoy learning through games. As the children discovers new concepts, their memory becomes active and constantly feeds their retentive memory. Simple facts and figures will remain with them all their lives and will be instantly recallable.

Maths Wise and the accompanying Teaching Guides have been written to appeal to and support teachers who may or may not have undergone a teacher training programme. It is hoped that, with the help of the Teachers' Notes and Teaching Guides, they will be able to adapt their practice to meet the learning requirements of pre-primary and primary school children.

Some of the important concepts that the *Maths Wise* series is based on are outlined below.

1. Children learn through discovery

Motivation is the one important factor which helps little children learn easily and with enjoyment. We see at home that children learn every minute they are awake; they want to learn and know more. With the help of this series, teachers will be able to give children the right direction and encourage them as they actively learn new things, in the school as well

It will be satisfying to know that:

- the children are happy.
- each learning experience is fun.
- concepts learned at any given stage will remain with them throughout their lives.

- Most children assimilate each topic in such a way that they can analyze situations and apply their knowledge at the appropriate time. For example, learning addition is applied to 'number families' of addition and subtraction. They recognize the addition pattern in multiplication tables, and apply knowledge of addition to daily life situations such as adding up a bill at a restaurant or finding out how much is left after paying a certain amount.

Lessons are often preceded by practical classroom or outdoor activities so that the children learn through discovery at every step. They are also encouraged to ask questions about everything. In a happy, carefree environment, children are more confident to ask; the more questions they ask, the better they learn.

2. Children use all the 5 senses

It is a known fact that the more senses used in the learning process, the better the understanding and retention. This is why the use of at least three senses in the classroom is recommended: touch, sight, and hearing. How a toy feels, (soft or hard), remembering and recognizing the shape of a toy, listening to what others have to say about it, and asking questions related to it, all contribute to learning. Sense of taste and smell are also used, whenever necessary.

Fun-filled classroom or outdoor activities will encourage children to use their senses fully and promote quicker learning and longer retention. By routinely engaging the children in these activities, their instincts, creativity, imagination, motor skills, and visual perception will develop. Classroom activities can be either preceded, or followed by a visit to a zoo, a garden, a market, a sweet shop, a welfare home for children,0 or even a bank, according to the topic being covered.

A sense of showing can also be developed by inviting children from welfare schools, and making them a part of an afternoon picnic.

3. Freedom in learning

The most important thing to provide in any classroom is the freedom for the children to learn at their own pace without undue pressure. Some children work faster than others: this must never be curbed. It is useful if teachers provide supplementary tasks to meet their needs so that they are not bored.

If a child is a slow learner, more practical work or repetition may be required. This must be provide in a patient, an encouraging, and a positive manner. A child should never be made to feel inadequate. Statements such as, 'Will you never learn?' or 'You are so slow!' are very hurtful, and must never be voiced. Every child is unique and special. The reward of seeing the progress made by a slow learner is no less valuable than that of observing the quick wit of a bright child. This is the most important principle of teaching.

If, on occasion, an activity seems to be beyond the understanding of most of the children in the group, insistence will only lead to frustration. It is prudent to leave the topic for a

later date when the children have been better prepared for the activity and are ready to absorb it. Demonstration is always the best form of explanation; a live object is better than an illustration.

4. Teachers praise/commend good work

Words of praise encourage children and ensure further good work. To illustrate this a 'smiley' can be stuck or drawn on a relevant page. It is a good idea to have blank smiley or WoW stickers as teaching aids. Interestingly, WoW stickers placed upside-down read 'MoM' which is always encouraging for children.

Smileys can also be stuck or drawn on each page in advance, and the children can then colour them—green for good and orange for improved work. Wow stickers can be used for the top achievers. Suggestions should always be given to indicate how poor work could be improved; it is discouraging to write 'Poor' or to show a crying 'smiley'.

Excellent

Good

Can do better

B. Use of the *Maths Wise* series

1. Maths Laboratory

A maths laboratory is highly recommended at all levels of school and becomes mandatory as children enter primary and secondary classes.

Teachers using *Maths Wise* will find it useful to look through the three Introductory Books in advance and to assemble a variety of materials suited to the topics taught at this level.

Children could be asked to bring toys, empty plastic bottles and bottle caps, beads, buttons, shells, and colourful pictures of animals and plants, the Sun, the Moon and stars, aeroplanes, cars, buses, beaches, trees—almost anything they are likely to encounter in daily life. How teachers display and use these thematically can be worked out as teaching and learning progress.

A set of shelves or a solid trunk is useful storage for these items until they are needed. If the lab is large enough, children can work there in groups; otherwise the materials could be brought to the classroom as required.

At the pre-primary level, a central maths lab will need all kinds of objects that the children are familiar with:

- toys, both soft and hard, made from 'safe' materials (i.e. no detachable bobbles or beads and no sharp edges)
- shells and beads (large, so that the children cannot swallow them).
- several sets of three objects, such as hats, two identical and one slightly different
- colourful pictures or charts to display on the walls of the classroom (eg. animals, cars, buses, flowers)
- fabric or card (plain or with straight or curved lines)
- solid 3-D wooden shapes such as cubes, ovoids, cuboids, pyramids, and cones
- flat shapes such as circles, squares, and triangles cut out of thick cardboard or wood, so the children can feel the flat surface and can count the corners and edges
- different lengths of twigs, ropes, and ribbons
- jars and tins of different sizes
- a handful each of large buttons; dried melon seeds, and dried watermelon seeds
- pencils and crayons of different colours and lengths
- wall charts relating to different concepts in the book
- identical halves of different flat shapes (such as pictures of butterflies and solids)
- squares of reflecting surfaces, preferably plastic
- 2-piece (or 3-piece) jigsaw cards with a number and corresponding picture for number concepts; similar cards for addition/subtraction sums
- non-identical halves of play dough or wooden toys for example, a bus cut into half
- a giant number line, either drawn on the floor of the classroom or in the playground
- cardboard cut-outs of the numbers 1 to 9
- number trays for number recognition
- sheets of paper with square and hexagonal grids
- number jigsaw pieces
- number tabs
- abacus sets
- number fact cards for +, –, × and ÷
- a rod with 1 to 10 hanging beads for number recognition
- plastic (or wooden) baskets or trays to contain the items
- plastic (or steel) bottles, glasses, and bowls
- a sandpit (outside)
- a patch of garden with different shrubs and pets (such as rabbits, white mice, tortoises)

- a fish aquarium and an aviary are all very useful for making comparisons

It should be mentioned that you will be working with very small children so a great deal of care should be exercised when selecting objects for the maths lab. All items should have rounded edges and must not be small enough for children to put in their mouths, noses, or ears. Supervision is very strongly recommended.

2. Wall charts and a maths table in the classroom

It is useful to have a maths table in each classroom. A selection of objects from the maths lab can be brought in as and when necessary. Changing wall displays frequently can go a long way towards making the learning of basic concepts of maths stimulating and exciting.

Wall charts and a maths table will help children to:

a. take interest in the subject and consequently improve concentration.

b. be aware of numbers in everyday life such as: 1 Sun, 1 tail of an animal, 1 nose, 1 mouth, 2 eyes, 2 legs of a bird; some animals have 3-toes on each foot (3-toed sloth); 4 legs of animals; 5 fingers and toes of humans; 6 legs of a spider (a hexapus has 6 legs); 7 colours of the rainbow, 7 leaflets in a leaf of the *saptaparni* tree also—known as the Devil's tree; 8 legs of a spider or an octopus; 9 planets, (there were 9 planets in the solar system, till Pluto was found to be a non-planet in 2006), and 10 fingers and toes. (Star constellations can be found with 7, 8, 9… 101 stars.)

c. associate animals with their homes and food. Big animals have big homes while small animals need small homes. For example, a lion lives in a den, a dog in a kennel, a rabbit in a hutch, a mouse in a hole, and an earthworm in a tiny hole in the ground. Similarly, a lion eats several kilogrammes of meat at a time, while a dog eats up to one kilogramme of meat a day.

d. identify similar objects, or the odd one out, in a group.

e. apply logic. Animals with four long legs run fast; birds, although they hop on two legs, cannot walk fast, and so have feathers to fly.

f. observe colours. Tomatoes and some roses are red; identify all the colours of the rainbow (and more) in flowers, fruits, and vegetables.

g. observe shapes in real-life. A carrot is a cone, as is a wigwam; there are many examples of spheres and ovals (egg shapes, aubergine). Bees build beehives with hexagons (6 sided polygon).

h. recognize fractions: two halves of any object are equal, be it a walnut, an apple, or a cake.

i. learn to do mental addition: 2 white mice and 1 more makes 3. This leads to multiplication: 2 hands plus 2 hands plus 2 hands makes 6, or 3 lots of 2 = 6

j. recognize sets: a set of vegetables, a set of toys, a tea set, a set of jewellery.

k. observe similarities and opposites:
   i) big elephant and small mouse
   ii) a mango and an apricot each have 1 seed, but an apple and a cucumber each have many seeds.
   iii) the seeds are always INSIDE a fruit while the skin is on the OUTSIDE.
   iv) an aubergine and a tomato have SMOOTH skin, but a bitter gourd has a ROUGH skin. Many more such examples can be found.

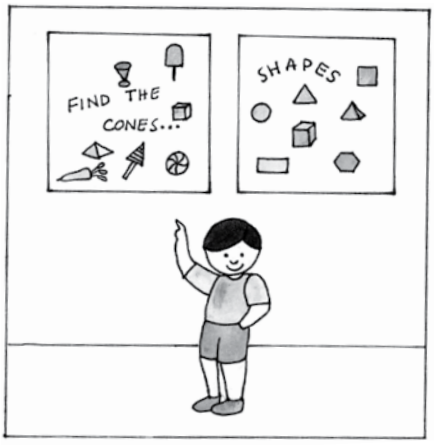
l. count—bring me 1 apple please, eat 2 cherries, a tricycle has 3 wheels.

m. associate numerals with sets of objects.

n. improve motor control as children hold objects, colour pictures, count on their fingers, draw curved and straight lines, and write letters or numbers.

o. develop vocabulary as new terms are introduced, e.g. a pair of hands, a pair of eyes, a tricycle, a quadruped, heavier than, longest of ….

3. Theme weeks and wall charts



Theme weeks add a zing to the topic at hand. The topics can vary from pets, to flowers, to neighbouring countries, to water transport. Pictures or wall charts related to a particular theme should be collected in advance (often with the help of the class), taped onto soft boards and brought to the lesson. They can be displayed for a few days, or as long as required.

Large, colourful pictures can often be found in newspapers and magazines. Many theme related picture books can be bought from second hand bookshops. It is also very easy to find appropriate pictures on the Internet and print them on paper or clear plastic sheets.

a. *A Week on Flowers*

A week on flowers can be planned for the flowering season, February/March, when most gardens are in full bloom. Activities could include a visit to a garden, with a display of pots of fresh flowers; display of paper flowers from a 'birthday party' store or pictures from magazines; making simple paper flowers; 'Wear a flowery dress/shirt day'; …a week is too short for all these ideas! But planned well, it can work.

What do the children learn?

Counting the petals on a flower, or the flowers in a pot; the different types of flowers in the park; different *colours* (any matching vegetables?) and their various shades; *shapes* or velvety of leaves; *textures* of petals or leaves (rough or smooth or velvety) or associating

a fragrance with a particular flower). The list is endless.

There are, for example, many different shapes of leaves. Some are oval, some are elongated, while others spread out like a fan. Some leaves have little 'leaflets', like the leaves of the tamarind tree or flame of the forest. Some leaves have smooth edges, others are serrated (*vocabulary*).

Shapes of flower beds or sequences in a flower bed can be observed: the curved edge of a flower bed; shorter plants, such as petunias, are planted in the front, taller ones like marigolds behind them, and the tallest ones such as dahlias, right at the back.

b. *A Week at the Farm*

'A week at the farm' can be held in the school playground if it is spread out, or in a neighbouring area or a farmhouse with animals (such as a horse, a cow, some sheep, some hens and ducks, and white mice).

Birds and animals: Caterpillars may look like big earthworms, but butterflies emerge from caterpillars, not earthworms (similarities and differences). Frogs croak while crickets twitter. If the visit is in the early evening, maybe fireflies could offer a variety of information. (Some birds use fireflies in their nests to provide light.)

A Pets Day can be organized as part of this week. Children who own pets can bring them to school. They can be introduced to friendly dogs, cats, rabbits, and birds, observing textures of fur and food habits. They can bring different fish in a suitable container. Discussion about babies is always exciting: a baby dog is a puppy, a duckling is a baby duck, a baby lion is a cub, and so on. And above all, children learn to handle pets and treat animals with affection.

Trees can contribute a great deal to learning: a beehive on one tree, a woodpecker pecking at the trunk of another, or peeling off the rough bark, or a squirrel scurrying up and down (feathers and fur).

Association of one to one... 1 dog in a kennel, 2 birds in a nest, 3 eggs being hatched or 4 fish in a pond. (please treat these merely as suggesting, to be developed as conveinent for the teachers)

c. *Protection of the Environment*

- Before preparing for an outdoor visit, each child must have *an extra napkin*.
- Children learn *not to pluck* flowers, and to care for plants.
- Children learn *not to throw* sweet wrappers or any other rubbish on the ground.
- Children *not be allowed eat chewing gum* or *spit it out.*
- Use of plastic MUST be discouraged.

  The teacher can lead the conversation to the importance of planting trees (*helps purify air and reduce pollution*).
- Children must learn to *wipe their shoes on a doormat* when going home after school.

- Children must be taught that hands gather dust all the time, especially after a farm visit. They must *not wipe their hands on their clothes.* They should *wash their hands properly and wipe them on clean napkins*

All this leads to *observation* (comparisons, similarities), *association* (grass is green and a cricket is green too), *logic and recognition* (this creature has two pairs of wings, which are not so colourful; so it is not a butterfly, but a moth). A hen lays big eggs, but an ostrich lays an egg equal in size to 24 hen's eggs! What about a pigeon's eggs, a frog's eggs and a mosquito's eggs?

d. *Vegetable and Fruit Day*

Encourage children to eat more vegetables and fruit because they are good for their health. A vegetable patch can be cultivated in the playground. They can bring, for example, 2 or 3 oranges, bananas, cucumbers, apples, carrots, guavas, and *chikoos*. A market is held, where each vegetable is priced at Rs 10 or Rs 20. Children are given pretend money to buy vegetables and fruit from the market. At lunch time, the teacher could make fruit *chaat* for everyone to share... it is a good way to introduce receipes...

Make a chart showing pictures of common fruits and vegetables. Record the names of the children who eat these during one week. It is essential to explain that eating fruit and vegetables is healthy. For example, a banana, an apple, some grapes, cucumber, and tomato (a combination of green, yellow and purple foods) or pomegranate, *lady fingers*, radishes, carrots, and capsicums (red, green, white, orange, and yellow) are readily available fruits and vegetables.

Have a competition: ask the children to draw the fruits and the vegetables that they have eaten during the week. Compare their lists, and award prizes to those who have eaten the most fruits and vegetables during a week.

Theme activities may appear non-mathematical, but for 3 to 6 year olds, all learning is integrated. Most of the language used daily contains mathematical terms or references. A variety of experiences will lead to improved motor control, reasoning, (a frog cannot lay a big egg), and creativity, and develop observation, association, recognition, retention, and logic skills.

4. Games and mazes

The books contain plenty of interesting games and mazes that help maintain the children' interest in maths. Most of these are based on the concepts taught in the books, so working with these helps revise and reinforce the concepts.

New mazes can be created by the teacher. These can be:

i) Pick up the fruits and the vegetables along the way, and not the pizzas and hot dogs.

ii) Pick up waste paper and put it in the dustbin.

iii) Pick (not PLUCK) all the pink flowers and put them in a vase.

5. Worksheets

The pages in the introductory books are designed as worksheets. Based on each of these, the teacher can make additional worksheets for extra practice.

For example, *Introductory Book 1, page 3* shows halves of a butterfly and an ice cream. Additional worksheets may show halves of a flower, a bird, a chair, a bottle, or a tennis racquet. There are two ways to halve a circular or square cake, but 3 ways to halve a triangular cake.

Worksheets with grids forming squares, triangles, and hexagons lend themselves to drawing different patterns.

Worksheets showing animals and their homes, other than those shown on page 5 of *Introductory Book 1* can be designed.

There can be more examples of IN and OUT (*Introductory Book* page 22) e.g. a boy going inside a house, and another one coming out, a rabbit in or outside a hutch, a seed in or outside a fruit.

For sequencing, design more patterns like those shown in *Introductory Books 2 and 3.* The children could be engaged in designing these worksheets; they will happily draw different patterns.

Based on the units on shapes, help the children make additional worksheets using pictures of the shapes being taught as on page 17 of *Introductory Book 3.*

C. Assessing the children's learning

Review and assess sections in all the three *Introductory Books* helps the teacher to assess the children' learning, retention, and understanding of concepts after a year.

End of term or annual tests are not recommended at this level. Use of words such as 'test' or 'examination' tends to create a sense of discomfort, or even fear, amongst children at this level; these terms are best avoided. If testing is necessary, it should be flexible and open-ended, with emphasis on assessing their retention, and their ability to understand and learn new concepts. Assessment throughout the term using worksheets or activities is a good alternative to testing.

Assessments may be conducted on the following lines:

1. Muscle control (Does the child sit upright? Can the child write letters/numbers? Does the child hold a pencil, spoon, or ruler in the correct manner? Can the child tie shoe laces?)
2. Memory (Is the child good at memory games? Does he/she remember to say please or thank you? Does he/she remember names of shapes?)
3. Recognition (Can the child recognize shapes, or find objects/numbers/letters hidden in pictures?)

4. Association (Does the child associate brown shoes and brown clips with a brown T-shirt? Can the child group sets of objects according to numbers, shapes, colours, or any other characteristics?)
5. Observation (Can the child identify missing features in an incomplete picture of an animal? Can he/she place things in a prescribed sequence, e.g. ascending or descending order?)
6. Logic and decision making, memory, association, recognition, and observation tasks develop reasoning and decision making skills. For example:
   a) 'The teacher has asked us to stand in a line in ascending order of height, starting in the front. I am the tallest. I must stand at the end of the line.'
   b) Squares are flat shapes, and wooden cubes are solids. To gift wrap a box, flat paper is needed.

D. The three introductory years

A child's first association is with the parents and then with the other members of the family. They learn at home by seeing, hearing, feeling, smelling, and tasting.

At home, everything and everybody is warm and every corner is comfortable. The child leaves this comfortable atmosphere and comes to a new environment where new faces and things greet him/her. A bond of love, trust, and security must develop between the teacher and the child before learning-through-play can begin.

Affectionate gestures need to be transferred to school: a little touch on the hand, a little pat on the back, a hug. All these go towards creating a friendly environment for the child in school. The responsibility for this, and for forming friendly bonds with the children lies squarely on the shoulders of the teacher. A relaxed, easy posture, a soft voice, encouraging words, a friendly touch, and a caring attitude, must be demonstrated before any learning can start. All children in such an environment will always be happy, and grow up as happy youngsters.

E. Lessons

It is suggested that the teachers spend 30 minutes per lesson. However the time spent on each lesson is entirely on the teacher's discretion and the ability of the students to grasp the concept.

UNIT 1
REVIEW AND ASSESS 1

Teaching objectives

- to revise and review concepts done in year 1

Learning outcomes

The children will be able to:

- recall 2D and 3D shapes
- recall opposites
- count and trace numbers between 1 and 10

Teaching materials

- 2D and 3D shapes
- counting beads
- chart depicting opposites
- number cards
- objects of everyday use like balls, books, lunch boxes, etc.

Learning activity

Lesson 1

Revision of the previously learnt concepts is a very important part of teaching at the formative years. Concepts must be consolidated before the children can be introduced to new ideas. When you revise earlier topics, always use examples or activities, which you have used before so that the children can connect to them, then move on to newer ideas. Redo the names of the shapes with the same set of teaching aids used in the previous year.

Hold a session with a display of gift-wrapped objects. Ask the class to guess the object inside each wrap, based on the shape that they see. Revise colours which the children became familiar with in year 1, by asking them to call out the colours of the wraps; revise numbers by asking them to count the gifts which have the same colour or the same shape.

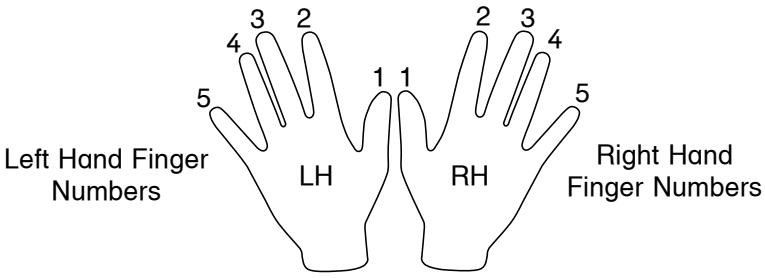
Take the children out for a game of 'Simon says'. Revise the opposites through the game. (Simon says, 'Lift your hands UP', Simon says, 'Put them DOWN'; bring a BIG

ball, bring a SMALL ball, bring a FAT book, bring a THIN book; OPEN the door, SHUT the door.)

For going through numbers from 1 to 10, use flash cards and counting beads. The flash cards can be shown to the children from time to time, to call out the number of objects on the card, or they can be put up on the boards.

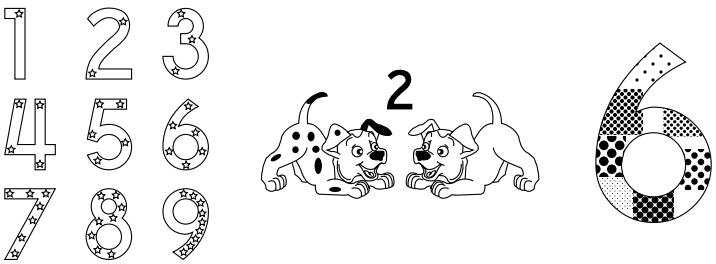
(Cards showing: 1 giraffe, 2 apples, 3 frogs … 10 beetles)

Children find it interesting to match a number to the set of fingers. Show the class 3 balls, and each child puts up 3 fingers. Show 10 finger caps on your hand, each child raises both hands.



On a few charts like the ones shown, have numbers written from 1 to 10 vertically in a decorative style, alongside:

- a group of objects from 1 to 10, such as 10 cherries, 2 parrots, 1 watermelon, 5 fingers, 9 strawberries, 8 triangular flags on a string and so on…
- Numbers written in words (decorative letters)
- Numbers written backwards



Write from 1 to 10 on the board, with a few numbers missing. The children copy this in their exercise books and fill in the missing numbers.

1 2 ….. 4 ….. …. .... 8 …. ….

Task: Children attempt pages 1 to 5.

Additional resources

At the end of the guide are additional worksheet 1 and 2. Use them for reinforcement.

UNIT 2
SYMBOLS

Teaching objectives

- to introduce symbols commonly used in real life and mathematics
- to let children practice by tracing these symbols

Learning outcomes

The children should be able to:

- identify symbols commonly used for the Sun, the moon, a star; letters of the alphabets, symbols for shapes
- identify the mathematical symbols (+ − = x ÷)
- trace a few mathematical shapes

Teaching materials

- a chart showing commonly-used symbols
- a chart showing mathematical symbols

Learning activity

Lesson 1: Symbols

Here are some common symbols (emoticons) children are familiar with:

☹ a sad face ☺ a happy face

Explain what symbols are and what problems we would face if the symbols did not have uniform meanings everywhere in the world.

Traffic lights often fascinate children of this age. The red, yellow, and green of traffic lights also symbolize something. Explain what it is.

Here is a limerick about traffic lights:

Red light on the road, what do you say?
I say, 'Stop and stop right away'.
Yellow light on the road, what do you mean?
I mean, 'Wait till the light is green'
Green light on the road, what do you say?
I say, 'Go and go right away'.

The children may also have seen the red octagon symbolizing STOP in a school race.

Letters of the alphabet are symbols too. Pin on each child's back a sheet of paper or card showing a numeral such as 1, 2, 3, 4. Other children see it and give clues to help the student guess what symbol it is. 1 can stand for 1 pat on the back, 2 for two pats and so on.

Introduce some familiar symbols from their surroundings, starting with the ones they see at school or neighborhood.



Explain what these symbols are for.

Lesson 2: Mathematical symbols

Talk about how numerals are symbols for quantities, and the letters of alphabets are symbols for sounds (phonetics).

Gradually introduce the mathematical symbols used with numerals. Show them the symbols on page 6 and tell them the meaning of each symbol. Help them trace the lines and teach them how to write the symbols.

For a practical demonstration, place a basket containing some beads on a table, and place another container of beads next to it. Place small + and – cards face down, near the basket. Each child goes up to the table and picks up a card. If the card says, e.g. + 2, the child should pick up 2 beads from the container and put them in the basket. If the next child picks up a card, which says, e.g. - 3, he takes out 3 beads from the basket and puts them in the container. (+ 0 and - 0 are introduced later.)

Task: The children attempt pages 6 to 9.

Additional resources

At the end of the guide are additional worksheet 3 and 4. Use them for reinforcement.

UNIT 3
PAIRING

Teaching objectives

- to familiarize children with similar objects

Learning outcomes

The children will be able to:

- match similar objects
- match halves of objects
- match objects with their outline/shadow
- find the odd one out

Teaching materials

- objects that children sees around themselves
- cut outs of shapes
- paint bottles

Learning activity

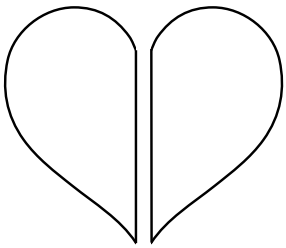
Lesson 1: Matching similar objects

Put 2 red balls, 1 green, and 1 blue ball in a basket. Ask the children which 2 balls are similar. Lay out 2 big pencils 1 medium-sized and 1 small pencil and ask the children which 2 pencils are similar. You may put together groups of such objects and ask the children to pick the similar objects. A chart showing different pairs will be useful. (a pair of objects in different positions: birds, shoes, two pairs of scissors … one open and one closed, ear rings, sea horses, dice)

Task: Children attempt page 10.

Lesson 2: Matching halves of objects

Use cut outs of pictures of familiar objects (a heart shape, a car, a cup, an apple, a butterfly, a kite). Fold them through the middle and ask the children to guess the picture. Give the children 2 or 3 pictures cut in halves and ask them to join the halves to make a complete picture. It is important to point out halves are not always identical (as on page 11).



Task: Children attempt page 11.

Lesson 3: Matching outlines with the objects

Use tiles of different shapes and dip them in paint. Make impressions of the tiles on a chart paper. Place the tiles alongside the chart paper. Ask the children to match the shapes with their impression. You could also play an interesting game of shadows. Use your hands and fingers to make shadow images of animals and birds ask the children to match the shadows with the actual animal or bird.

Lesson 4: Finding the odd one out

Place the following sets of objects on the table.

Set 1: a cup, saucer, teapot, pencil

Set 2: a triangle and 4 dices of different sizes

Set 3: 3 books of different sizes and a key

Set 4: a bangle, a ring, a locket, a shoe

Discuss why a pencil is the odd one out from the tea set, a shoe from the jewellery.

Point out the fact that the teacher's desk is the odd one out amongst the children's desks. Put together many such sets with less obvious differences and discuss the odd one out: a sheep amongst goats (toys or pictures), a rose bud amongst roses in full bloom, a red ball point pen amongst black ones, a telephone amongst cellphones.

Always encourage divergent thinking.

Task: Children attempt page 12.

Additional resources

At the end of the guide is an additional worksheet 5. Use it for reinforcement.

UNIT 4
OPPOSITES

Teaching objectives

- to introduce the children to pairs of words with opposite meanings

Learning outcomes

The children will be able to:

- identify objects such as rough and smooth, heavy and light, empty and full, hard and soft, on or under and several such opposite pairs.

Teaching materials

- objects the children see around themselves, which fall in these 'opposites category' such as rough or smooth, heavy or light; empty or full and hard or soft;
- class room charts with opposites drawn on them.

Learning activity

Lesson 1

Use a chart showing opposites such as a laughing Smiley and a crying Smiley, a hard stool and a soft sofa, a dolphin above water and a dolphin swimming under water, a tall tower and a short one, a black winged bat and a white bat and so on.

Take a pair of 'opposite' objects at a time, for example, rough and smooth or big and small objects. You may take a piece of silk and a piece of sack, an apple and a custard apple, a bark of a tree and a smooth leaf. Talk to the children about texture of objects. Ask the children to touch each of the objects and feel them.

Ask them to differentiate between coarse and smooth, by touching the objects. Introduce the words smooth and rough. Opposites not mentioned in the books must also be referred to: long and short hair, dark and white chocolate, sunny and shaded areas in the garden, and so on.

Task: The children attempt page 13.

Lesson 2

A see-saw is a good example of introducing 'heavier than' and 'lighter than'. Arrange for a balance. Ask the children to put two different things (such as a large stone and a small book) on the two pans. Explain the reason for one pan going down and the other pan

rising up. Introduce them to the words heavy and light.

Let them spend some time weighing some of the objects they see around them. They get some idea about which objects are heavy and which are light. It is too early yet, but children may like to hold objects in their hands and guess which is 'heavier' and which is 'lighter'.

Task: The children attempt page 14.

Lesson 3

From a set of paper cups, some filled with water, sweets or sand, and some empty, introduce the terms empty and full. Fill a cup with a few pebbles and remove them one at a time from it until it is empty. Tell them that in an empty cup, there are NO or ZERO pebbles left. This is a good way to introduce the concept of zero.

An interesting concept to work on is a bowl full of pebbles. Ask the children, "Is the bowl full?" The children will obviously answer in the affirmative. Then, pick up a glass with some water in it and pour it on to the pebbles. The water settles in the spaces between the pebbles. So, if the bowl was full, where did the water go?

Task: The children attempt page 15.

Lesson 4

Take some hard and soft objects. For example: a soft toy and a wooden toy, an apple and a strawberry, a loaf of bread and a slice of bread, a piece of chocolate and a spoon of ice cream, a cricket ball and a *gulab jamun*, a brick and a sponge. Ask the children to feel each of the pairs of objects, and introduce them to the words 'hard' and 'soft'.

Tell them that a hard object cannot go out of shape by pressing. A soft object can take on a different shape when pressed.

Repeat the exercise with several objects. Encourage the children to list these:

Hard objects: wood, an iron key, a cricket ball, stone, coin, brick, comb, shell

Soft objects: cheese, tomatoes, sponge, any cloth, pillow, a cuddly bear

Task: The children attempt page 16.

Lesson 5

Each child has a pencil lying on his table. He knows his pencil is ON the table. Now, each child puts his pencil on the floor, under the table. They understand the word UNDER. A sweet in the mouth can be on the tongue or under the tongue. In the bed, a pillow can be UNDER the child's head, or when he is feeling sleeping, the pillow can be ON his head. A child can be sitting ON the bench, or hiding UNDER the bench.

Task: The children attempt page 17.

Additional activity

Show the children a picture (page 18). Ask them to look carefully and memorize the position of the animals. Now remove the picture and ask them questions using the terms you taught them.

Is the butterfly UNDER the snake or ON the snake?

Is the owl IN the tree or OUTSIDE the tree?

Is the monkey HEAVIER than the rabbit?

Is the snake LONGER than the monkey's tail?

Is the skin of the banana SMOOTH or ROUGH?

Is the skin of a pineapple (bark of a tree) SMOOTH or ROUGH?

Is the hole in the tree EMPTY or FULL?

Is the ground OUTSIDE the school building ROUGH or SMOOTH?

Is the floor INSIDE the school building ROUGH or SMOOTH?

This can be turned into a fun quiz. Give each correct answer a sticker. The children construct comparative sentences from the objects in their surroundings.

Additional resources

At the end of the guide are additional worksheet 6 and 7. Use them for reinforcement.

UNIT 5
SHAPES

Teaching objectives

- to review and revise the shapes learnt during year 1
- to introduce new shapes

Learning outcomes

The children will be able to:

- recall from memory 2D and 3D shapes
- relate the names and shapes of a triangle, a square, a circle, an oval, and a rectangle

Teaching materials

- a variety of 2D and 3D shapes
- a chart with corresponding shapes
- paint

Learning activity

Lesson 1

Review the 3D shapes worked with during the previous year, with the actual shape blocks and some real-life objects. Remind the children that 3-D shapes can be held in both your hands.

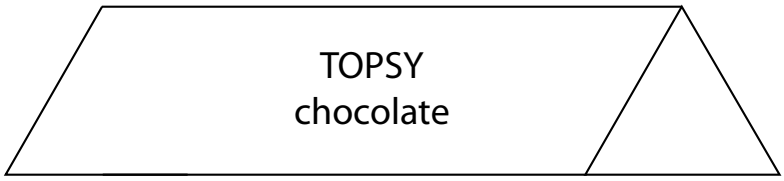
For example:

Spheres: a globe, an orange, most balls, some chocolates

Cubes: a box, a wooden block, a sugar cube, a box for a hat

Cuboid: a bar of chocolate, a bar of soap, sweets or cough drops, a Geometry box, most other boxes of everyday use

Prism: a real glass prism, a triangular chocolate box



Cone: a party hat, an ice cream cone, a volcano, a traffic cone

Cylinder: any juice or fruit tin, certain types of glasses, a grass roller, a clown's hat (cylinders with oval faces are available, but not easy to find), cosmetic bottles, lipstick cases

Pyramids: candles, lamp shades, gift wraps.

Not all of these might be available to show to the children; however pictures would suffice.

The simplest way of differentiating between a prism and a pyramid is that a pyramid will always have a pointed end above the base. A prism does not have a pointed end. A prism can make a stool, but you can never sit on a pyramid.

Children play with these solid objects, and feel the face. Then tell them to count the number of faces of each solid, such as cubes and cuboids. Let them paint each of the faces and create an impression of it on a piece of paper. Number of sides of a sphere, a cone and a cylinder are not very simple to understand. Children need to feel and roll these solids in their hands.

Talk to them about 2D and 3D shapes with respect to each object and the impression. Also mention flat and curved faces. Introduce the shape triangle, square, circle, oval, and rectangle.

Ask the children to trace their fingers on the margins of the shapes. Talk to them about the properties of the shapes and how to distinguish them. Ask them to name objects from the class that are a square, a rectangle, a circle, a triangle or an oval in shape.

Task: Children attempt pages 19 to 23.

Additional resources

At the end of the guide is an additional worksheet 8. Use it for reinforcement.

UNIT 6
SEQUENCING

Teaching objectives

- to introduce the concepts of BEFORE and AFTER
- to introduce the concept of sequencing

Learning outcomes

The children will be able to:

- arrange pictures in a BEFORE and AFTER sequence based on their real life experiences
- sequence a series of 4 to 5 pictures based on their real life experience
- sequence a series of 4 to 5 pictures based on a story or a rhyme

Teaching materials

- picture cards
- story book
- a CD with rhymes
- number beads

Learning activity

Lesson 1

A sequence of BEFORE and AFTER is a completely new formal learning concept. It will take time to consolidate an ordinal sequence of FIRST, SECOND, THIRD, FOURTH, and FIFTH. Do not rush through it, as later on it may create difficulty for the children to grasp concepts of > or <.

Remember: **Ord**inal is **Ord**er of things: first, second, third …

Example: The tall tree is the 2nd in the row

Fourth in the row is a bush.

Cardinal is **C**ounting: 1, 2, 3, 4 …

Example: There are six flowers in the basket.

In this race, there are 5 children running. The girl with Number '10' is in the 1st position.

- 5 is a Cardinal number (How many?)

- 1st is an Ordinal number (Position)
- 10 is a Nominal number (Number of the winning girl, instead of her name)

Work with several classroom situations for cardinal numbers. How many fans? How many windows? How many chalks?

For ordinal numbers, standing in a row in the garden works well. An assortment of questions such as these works well.

The 1st child has a flower in her hand.

The 2nd child is taller than the 3rd child.

The 5th child is wearing black shoes.

This concept can also be introduced through a story or a narration of an event. The children are asked to listen carefully, because they will be required to repeat the story.

Example: *Ramla went to a mall, with her mother. They went up the elevator to the 1st floor. They were really hungry, and went ta a pastry shop first. Her mother bought 2 chocolate pastries, and they ate them. Then, Ramla bought a lovely doll from a toy shop. And, finally, her mother bought some groceries from the Marx and Sparx. Their hands were full, and they took a bus to go home.*

A set of pictures showing these activities put on the wall will be useful. Children are asked relevant, leading questions such as:

- What did Ramla and her mother do first?
- What did they do last?
- Did Ramla buy the doll before they bought chocolates?
- Did Ramla get into the bus before they bought a doll?

Then, the pictures can be taken off the wall, and shuffled. The children are asked to place them according to the sequence of events in the story.

Repeat the exercise with another simple story about a picnic or a fair. A similar exercise with rhymes learnt earlier can be fun. Play the rhymes on a CD player and ask them to listen very carefully. Then, give them picture cards with the main events and ask the children to arrange the cards according to the sequence of events in the rhymes.

Talk to the children about their daily activities and the order in which you do them. For example, '*You wake up in the morning, get out of bed, put on your slippers, go to the bathroom, brush your teeth, come to the table, have your breakfast of 2 toast, 1 egg and 5 cherries. There were 7 more cherries still left in the bowl. Then, have a bath; get ready for school, wait for the bus, and get into the school bus for school.'*

Ask questions like:

- How many beds in the room?
- Who went to the bathroom 1st?
- What do you do before gong to the bathroom?

- What do you do after having your breakfast?
- How many cherries did you eat? Left in the bowl? Total?

Give them picture cards and ask them to arrange according to the sequence of events. With each example, increase the number events.

Task: Children attempt pages 24, 25, and 26.

Lesson 2

Colouring the shapes in sequence of colours in the first group also follows the pattern. This can be done on the floor in the garden placing yellow, red, and green cubes in order, as per the example worked out. Or alternatively, they string big coloured buttons and beads, different shaped sea shells in order.

Task: Children attempt page 27.

Lesson 3

Page 28: The maze has also been set to remind the children about an important aspect of everyday life in school and elsewhere: 'DO NOT THROW WASTE'. You could also work on 'DO NOT USE PLASTICS" whenever possible.

A similar maze on the floor or in the garden, with different objects can help them remember the order of the objects the little girl picks.

Additional resources

At the end of the guide is an additional worksheet 9. Use it for reinforcement.

UNIT 7 COLOURS

Teaching objectives

- to introduce the children to mixed colours

Learning outcomes

- the children will be able to identify orange, green, purple
- they will be able to mix 2 colours and create orange, green and purple
- they will be able to identify and recall from memory orange, green and purple objects in their everyday life

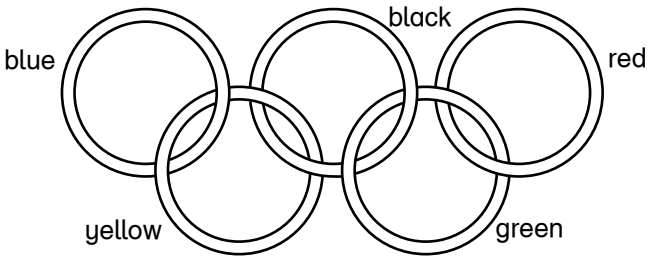
Teaching materials

- paints
- orange, green, and purple objects
- outline pictures

Learning activity

The children may work in groups. Give each group a bottle of yellow and a bottle of blue paint. Ask to mix these together. Once the children look at the new colour formed, give them the name of the colour, green. Green is one of the three primary colours they learnt about earlier. The grass is green, and the rose is red; the sky is blue and I love you.

Olympic rings



The olympic emblem has 5 colours.

Green is everywhere in nature and in our lives such as leaves, leafy vegetables, raw fruits, capsicum, ribbons, clothes, etc. We often hear about GO GREEN (tell them what does this term mean). The flag of Pakistan is green. Discuss flags of different countries,

which have these colours. Christmas tree is green. Parrots are green.

Blue is the colour of the sky and the deep blue sea. Some flowers are blue, some fish are blue in colour, and there are blue birds. A lot of blue can be seen in porcelain, ancient architecture, and in mosques.

Yellow is associated with sunshine, gold and many flowers around us. Marigolds are yellow and orange.

They work with bottles of yellow and red colours. Ask the children to mix them up and create the colour orange. Orange is an important colour worn by followers of Buddha around the world.

They mix blue and red paint and create purple.

Keep some green, orange and purple objects on a sideboard in the classroom. Ask the children to name 5 objects that are orange, green, and purple.

It is useful to put up pictures of objects like flowers, fruits, or vegetables that are of the above colours.

Another interesting activity is children wearing clothes of the same colour (for example, green) on a particular day. Or they might bring an orange object to school, such as an orange coloured crayon or pencil, an orange, an orange greetings card, an orange ribbon or a strip of cloth.

All these are bits of information for you to base your lesson on. It really depends on the time you can give for these added activities.

Give them outline pictures, which need to be coloured in one or more of the above colours. A cardboard vase with differently coloured artificial flowers and leaves is always useful. The vase can be coloured blue.

Give them other primary colours to play around with and new shades of colours, by mixing different quantities of different basic colours.

Children work with individual bottles of these colours and a chart paper, in the garden. They make a chart of hand prints or footprints in these colours. Or, they draw big fish (like that on the cover of Introductory Book One) and paint the scales in these colours.

Task: Children attempt pages 29 to 32.

Additional resources

At the end of the guide are additional worksheet 10, 11, and 12. Use them for reinforcement.

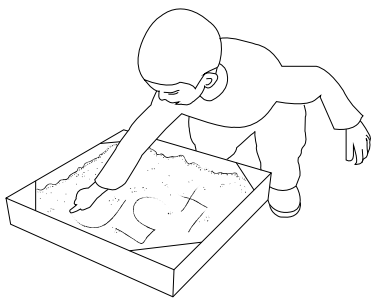
UNIT 8
DRAWING PATTERNS AND LINES

Teaching objectives
- to develop good motor control and handwriting
- to trace lines and draw lines of different shapes

Learning outcomes
The children will be able to:
- trace straight and curved lines
- identify vertical and horizontal lines
- draw pictures using straight and curved lines

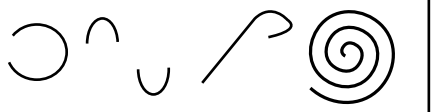
Teaching materials
- sand pit and sticks
- board and chalk
- crayons and white or black chart paper
- pieces of string and bottles of paint

Learning activity
Take the children out to the sand pit. Give each one a smoothened out wooden stick. Draw patterns in the sand and ask the children to trace these with their sticks. If the children find it difficult, you can let them use their fingers first to trace smaller lines. Make sure the sand pit is placed in a shade.



A similar exercise may be repeated on the class board with chalks. Draw a pattern on the board and ask the children to trace it with their fingers or a chalk of a different colour.

The Line Family

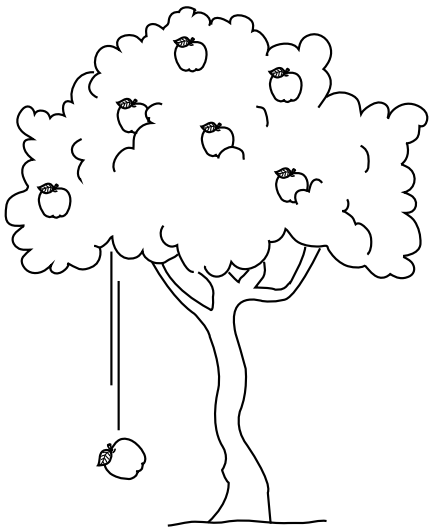
Straight	
Curved	
Angle	

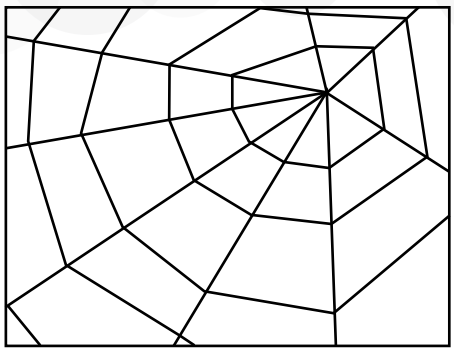
Dip a few pieces of thread into a bottle of paint and place these on a white paper to draw curved and straight lines. Once the paint is dry, remove the threads and the children trace over these lines.

During these activities, the concept and the words ‘curved lines’ and ‘straight lines’ can be introduced. The angle or a corner forms when two straight lines meet or (intersect).

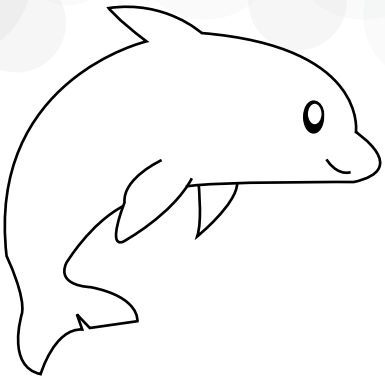
A variety of objects in the classroom, such as sticks and drinking straws can be shown to emphasize straight lines. The handle of a walking stick, the crescent of the moon and the frame of reading glasses, are all based on a curved line. The arm is straight, but the fingers can be curved. A snake moves in a curved line. A clothes hangar has a straight line and a curved line.

A ball thrown up in the air and falling back into your hands, moves in a straight line. A cricket ball thrown at a batsman often moves in a curved line. A ball returning from a bat can move either in a straight line or a curved line.





Straight lines in a spider's web



Curved lines —— a whale's body

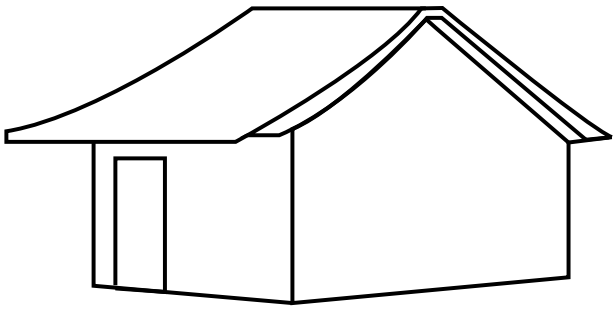
Consolidate the concept using crayons and white paper through a game. Draw different types of curved lines on the board and a few straight lines (use different coloured chalks).

You call out 'curved line' and the children draw a curve of their choice. You call out 'straight line' and the children draw a straight line. Ask each child to hold up his/her work for the class to see. Movement in a garden can be organized in straight lines or curved lines. A march past is done in a straight line; a dancer dances in curved lines.

This process will help the children understand the different varieties of curved lines. The exercise becomes even more useful for straight lines. Some children may draw a horizontal straight line, some may draw a vertical one or some may draw straight lines at an angle (as is done in a spider's web).

Discuss explaining that all the positions of straight lines are correct. Then introduce the names:

- A standing line: a vertical line
- A sleeping line for a horizontal line.
- Also show them that a vertical line can be turned around to make a horizontal line and vice versa.
- A reclining line is an oblique line



Task: Children attempt pages 33 to 36.

Additional activity

This activity (if time permits) will help children realize that the straight line distance is the shortest distance between 2 points.

On the classroom floor, place a few mats randomly and draw a straight line and some curved lines joining them. Mats are labeled as follows:

House

Friend's house

Park

Ice cream parlour

Now tell the children a story about a girl who sets out from her house with her elder brother. She visits her friend at her house, and then goes to play at the park. She then has an ice cream at the ice cream parlour and returns home. She can walk only along the lines drawn on the floor.

Find the shortest route for her. Help the children to actually measure the paths using their steps or paces.

IT IS IMPORTANT TO REMEMBER THAT A STRAIGHT LINE IS THE SHORTEST DISTANCE BETWEEN TWO POINTS. ANY CURVED LINE WILL ALWAYS BE LONGER.

Draw 2 points the floor. Take a roll of rope, and place one end at one point. Ask a child to hold it. Stretch it to the other point. Cut it and keep it aside.

Place one end of a different coloured rope at one of the two points, and ask a child to hold it. Go along a wavy path, from this point to the other. Cut the rope.

Hold both the pieces of rope together, see which one is longer.

Additional resources

At the end of the guide is an additional worksheet 13. Use it for reinforcement.

UNIT 9
NUMBERS

Teaching objectives

- to count objects from 1 to 50
- to recognize numbers between 1 and 50
- to add 2 numbers between 1 and 10
- to introduce the concept of zero

Learning outcomes

The children will be able to:

- recall from memory numerals 1 to 50
- count from 1 to 50
- add 2 numbers between 1 and 9
- conceptualize zero as 'nothing'

Teaching materials

- counting beads
- number cards
- abacus
- pictures

Learning activity

Lesson 1: Review

Review numbers 1 to 10: Previous year's concepts must be consolidated before the children can be introduced to newer ones. When you revisit concepts previously done, always use examples or activities which you have used already so that the children can connect to it, then move on to new examples and activities. Use the number cards, counting beads and marbles (bundled in groups of 10) to revise numbers from 1 to 50. Redo sequencing of numbers from 1 to 50 orally.

Teach backward counting using the number train from 10 to 0. Revisit addition and subtraction with oral activity and role-play.

Task: Children attempt pages 37, 38, and 53.

Lesson 2: Addition/Subtraction

Addition comes automatically to a child when he gets one sweet and then another; or if one child is sitting on a bench, and another child sits next to him.

It would be a good idea to start addition with children holding up their fingers. The children count by opening the wrist and putting one finger up for 1, then putting another finger up for 2 and so on. Finally, they hold 5 fingers of one hand and 1 of the other, adding up to a total of 6.

Ask them to show 4 fingers on one hand and 1 on the other. Now ask another child to count all the fingers together. Repeat the exercise several times. Similar exercise may be done with beads. Give one child 3 beads and to another 2 beads. Now ask to count all the beads. You may put the children in pairs and ask them to play the game of beads.

Introduce subtraction, informally, in a similar way. Say, 'Hold up 7 fingers. Close 2. Count the number of fingers still held open.'

8 children stand up. Ask a child to count the number of children standing. A few of them sit down. How many are still standing? Repeat the exercise asking a different child to count each time.

Addition can be taught with marbles, plastic fruits, chalks, chewing packets, and any other objects. Work with a number line on the floor or on the board.

Lesson 3: Reinforcing the concept

Take the children out in the garden and play a game of musical chairs. Put a chair for each child in the first round. Ask them to count the chairs. After the first round remove 2 chairs. Now ask them to count the chairs and ask them how many are left. Now play a round and tell them to find out how many chairs were removed by looking at the number of children who could not sit on a chair. Repeat the exercise several times.

In the garden draw a number line on the ground. The children can play jumping on the numbers for fun. Then, you instruct each child to move, for example, 2 places and then another 4 places forward. Which number do you land on? You may also ask them to move backwards to help them with subtraction.

Task: Children attempt pages 39 to 41.

Lesson 4: Introducing the symbols

Talk to the children about the concepts of addition and subtraction through a story or actions. *Rubina had 5 apples. Her teacher gave her 3 more. How many does she have now?*

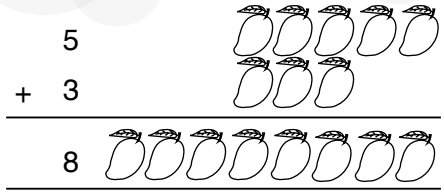
Hand out 5 sweets to a child and then give him/her 3 more. Ask him/her to count the total number of sweets with them now. Ask which is more?

The three points to reinforce are:

'8' is the sum of 3 and 5

'8 is greater than 5'

'8 is greater than 3'.



Or

5 ///// + 3 /// = 8 ////////

Tell that the sum of any two numbers will always be greater than each one of them, as is obvious from the addition.

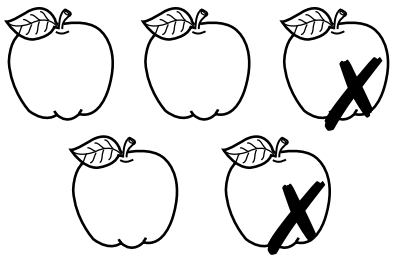
Introduce the children to the symbol of addition '+'. It stands for addition and is known as the PLUS sign. On the class board, draw one horizontal line and add to it a vertical line. It indicates one and one. This is ADDITION.

Then, a couple of sums can be done on the board using the PLUS symbol. Tally marks may be drawn and counted (in place of objects) and the total numbers of tallies give the final answer.

Task: Children attempt pages 40 to 42.

Lesson 5: Introducing the symbols (contd.)

Go back to the story: *Rubina has 5 apples; she gave away 2 apples to her best friend. How many is she left with now?*



Enact the situation and ask the children to count and tell you how many are left.

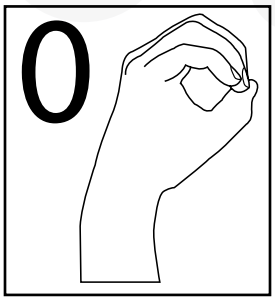
Introduce the word subtraction and its symbol '–'. This is a MINUS sign.

Explain that subtraction reduces the original quantity. So subtraction always ends up in a fewer number of things than what there were, to start with.

Work out a couple of examples using '–' sign on the board. Teach the children to use tally marks for subtraction.

Task: Children attempt pages 43 to 47, and 49.

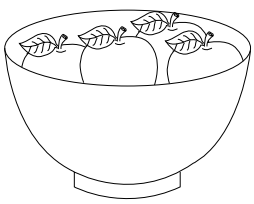
Lesson 6: ZERO

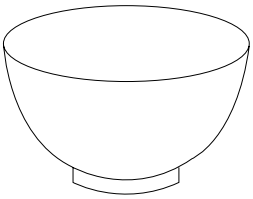


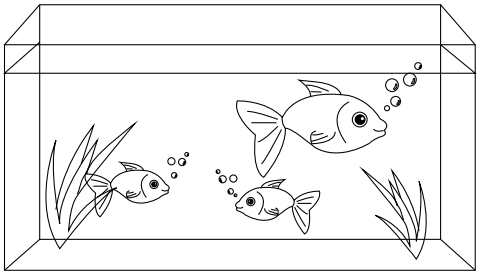
The usual role-play for the 0 concept works well. Give student 5 gifts. Ask him to give away the gifts to 5 friends, one to each child. How many gifts is he left with?

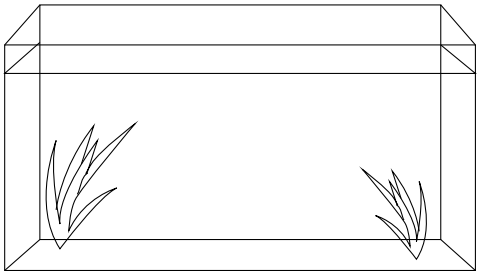
One teacher in the classroom; she goes out. How many teachers left?

If there are no apples in a bowl, how do you count them? If there is no fish an aquarium, how do you count it?









Explain the concept that zero means NOTHING. Repeat the exercise with various practical situations. You may do an enactment similar to the limerick on page 50/51 of the book.

Task: Children attempt pages 48 and 52.

Additional resources

At the end of the guide are additional worksheet 14, 15, and 16. Use them for reinforcement.

UNIT 10
REVIEW AND ASSESS 2

Teaching objectives

- to assess learning of concepts taught

Learning outcomes

The children should be able to:

- recognize living and non-living things in their surroundings
- identify objects by their characteristic features
- associate living creatures with their respective offspring, habitat or food
- recognize primary colours and associate them with common objects
- identify opposites
- identify and match objects and shapes
- distinguish between straight and curved lines
- recognize, match, and count numerals 1 to 10
- be able to write the numerals from 1 to 10

Teaching materials

- worksheets

Learning activity

The review and assessment can take a couple of days depending on the school's schedule for final assessment. Use worksheets that are simple and easy to understand and which test only the knowledge, understanding, and application of what has been taught throughout the year. The worksheets at the end of the book may be used, or additional worksheets can be designed for this purpose. As stated previously, assessment does not necessarily have to take place at the end of term; it can take place throughout the year.

Use the last two pages of the book to devlop better reading and writing skills and good social skills.

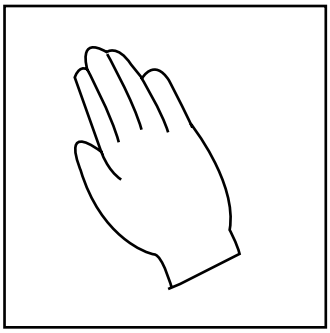
An interactive game could be designed incorporating all the concepts taught. It could spread over two periods.

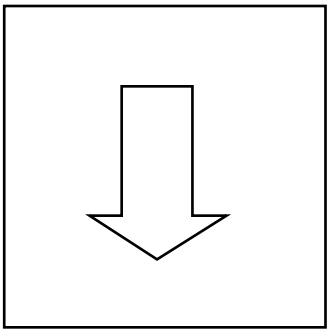
Additional resources

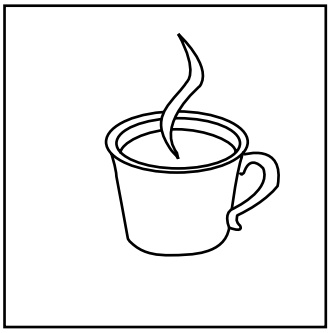
At the end of the guide are additional worksheets 17 and 18. Use them for reinforcement.

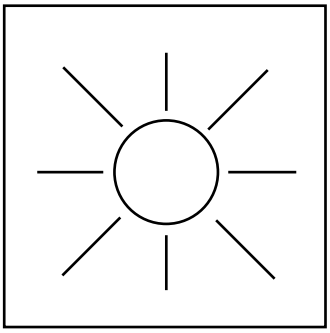
Worksheet 1

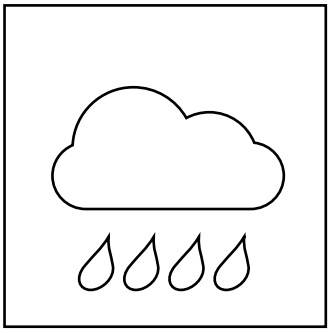
Opposites

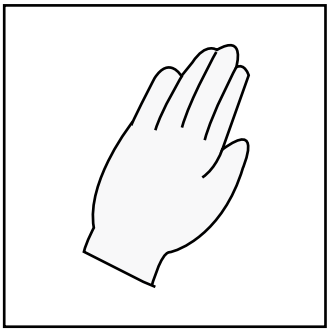


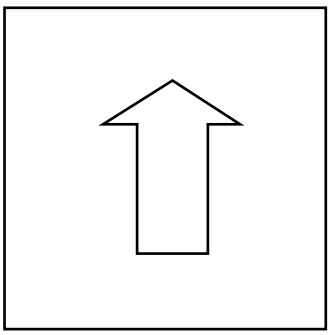


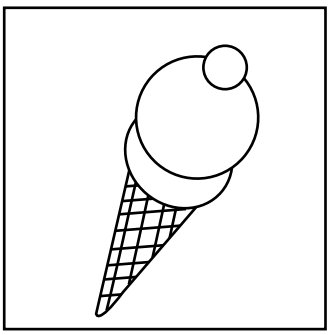






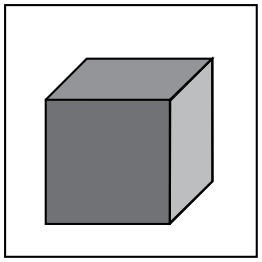
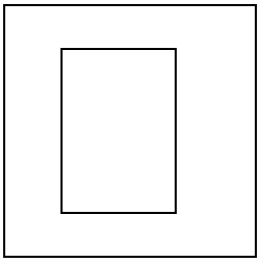
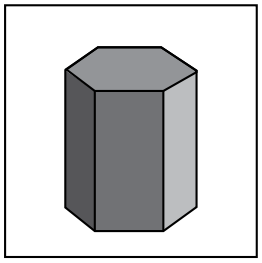
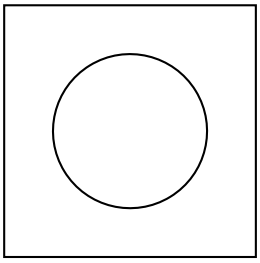
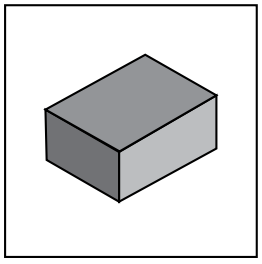
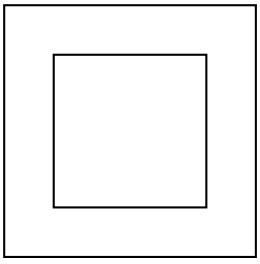
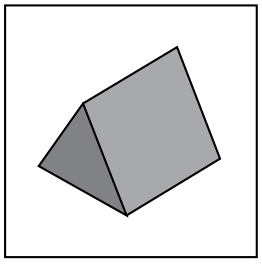
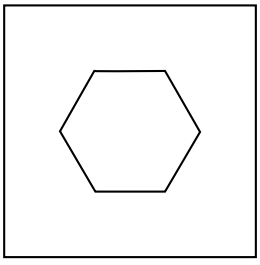
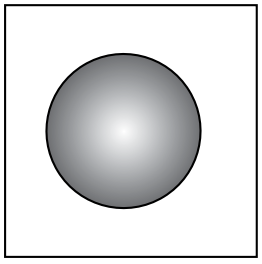
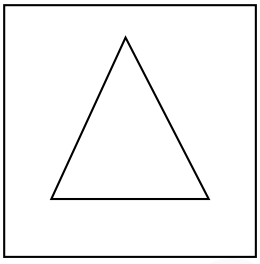






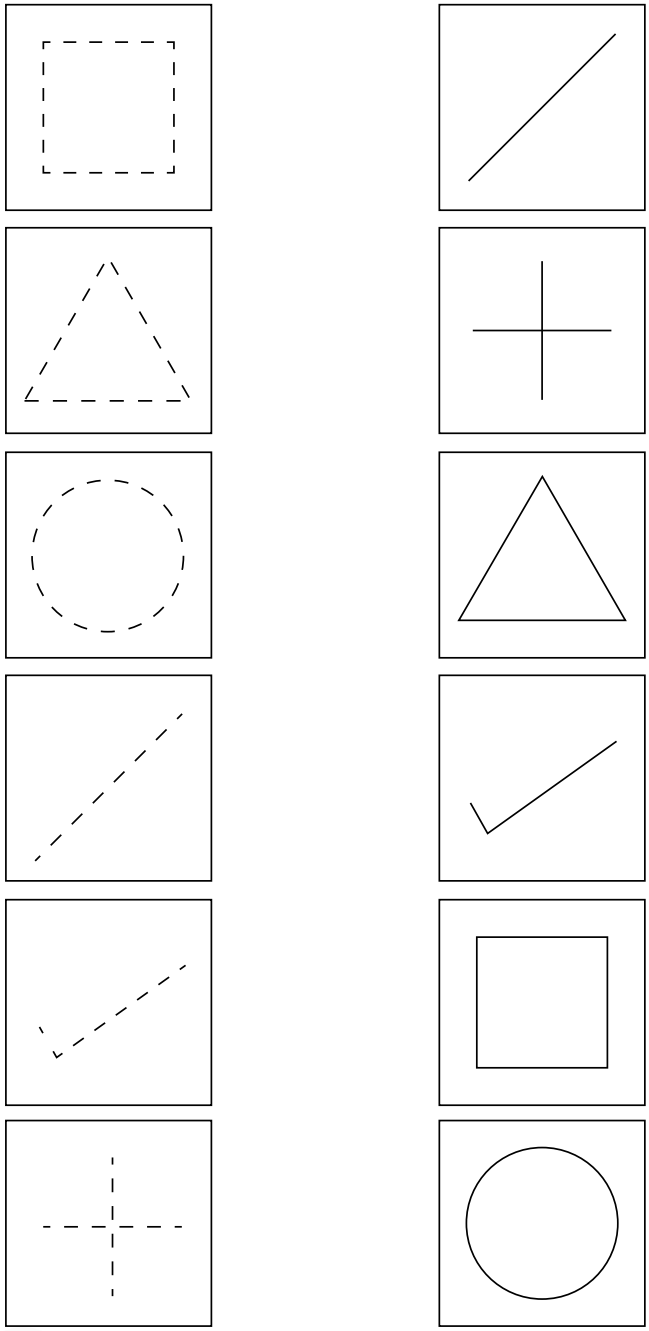
Worksheet 2

Match 3D and 2D shapes.

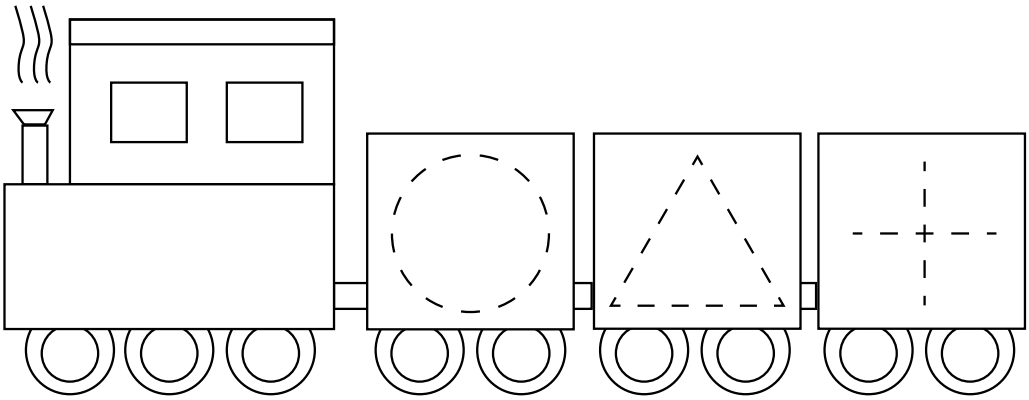
Worksheet 3

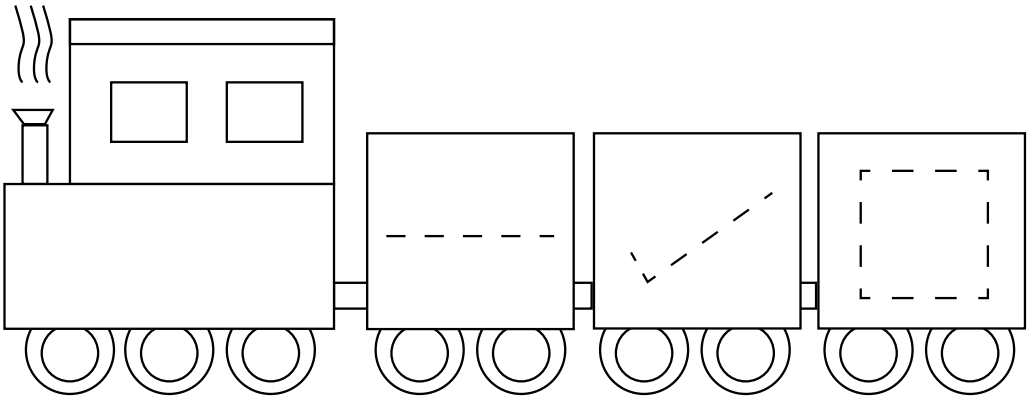
Trace over the symbols and then match.

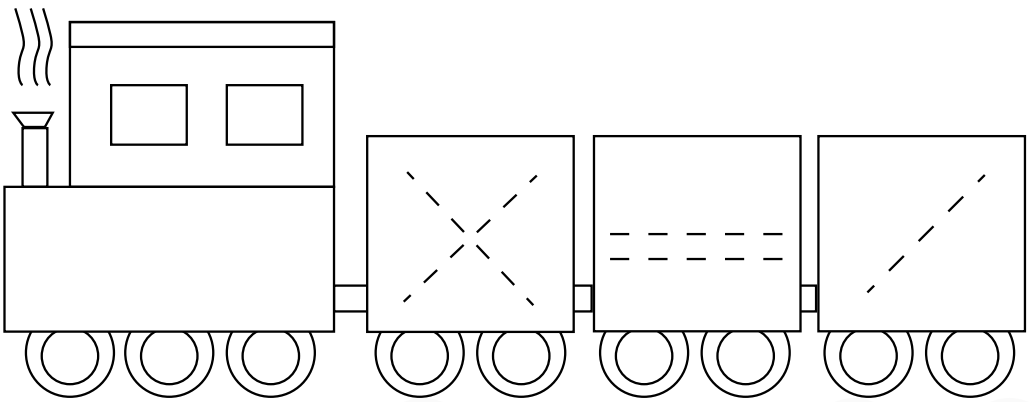


Worksheet 4

Trace over the symbols.

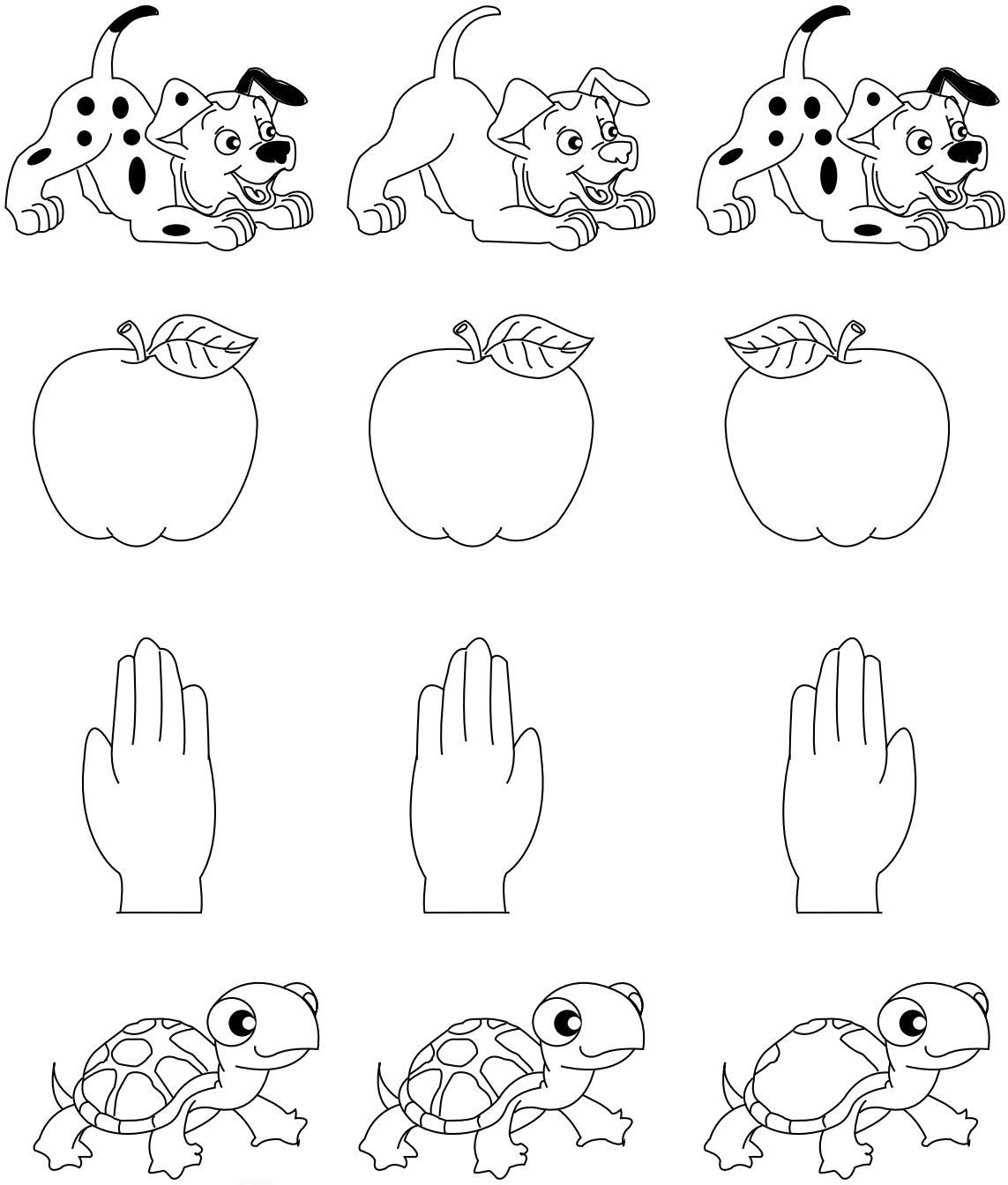






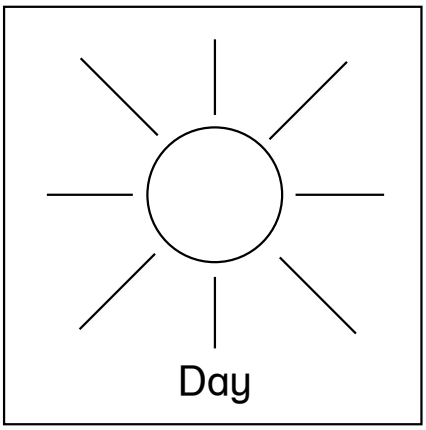
Worksheet 5

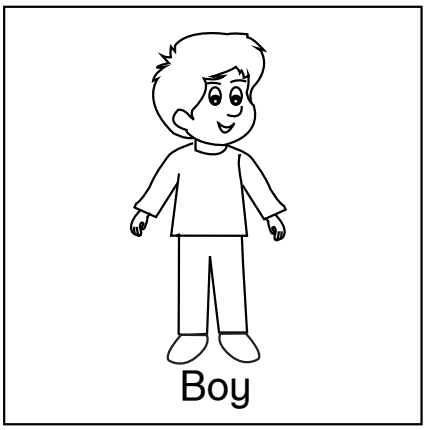
Cross the odd one out.

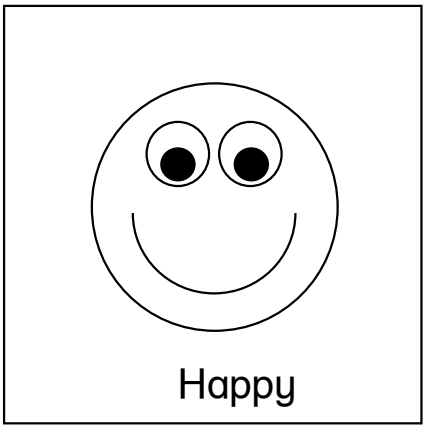


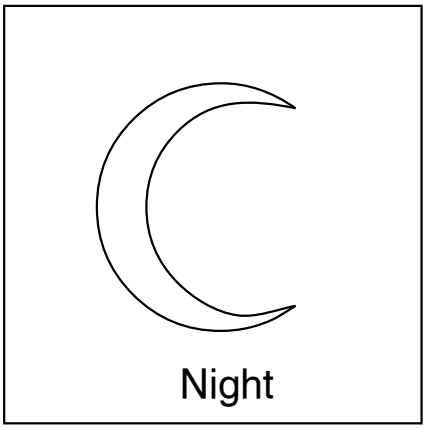
Worksheet 6

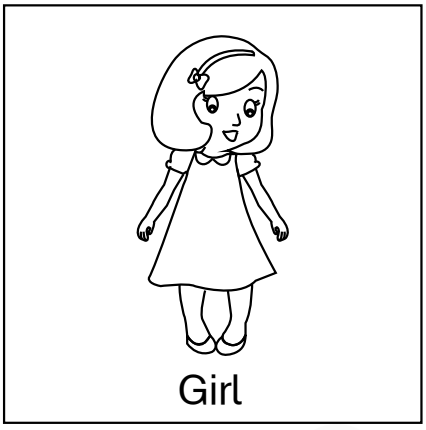
Opposites.

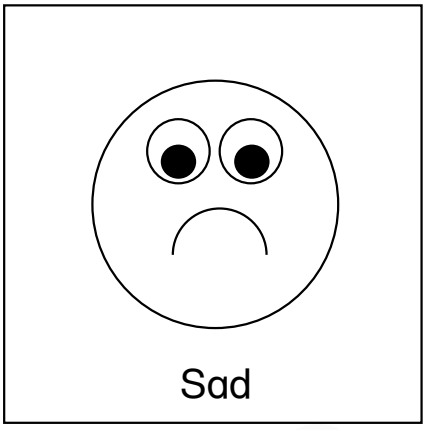








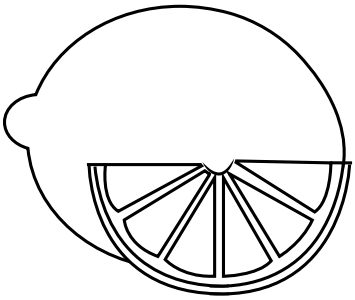




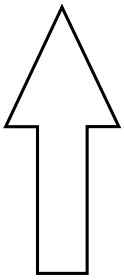
Worksheet 7

Match the opposites.

long

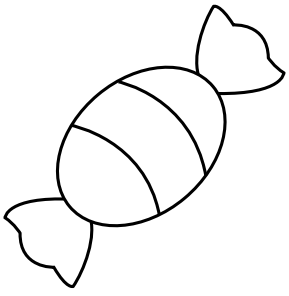


Sour

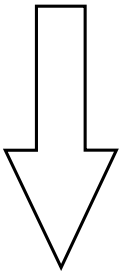


Up

Short



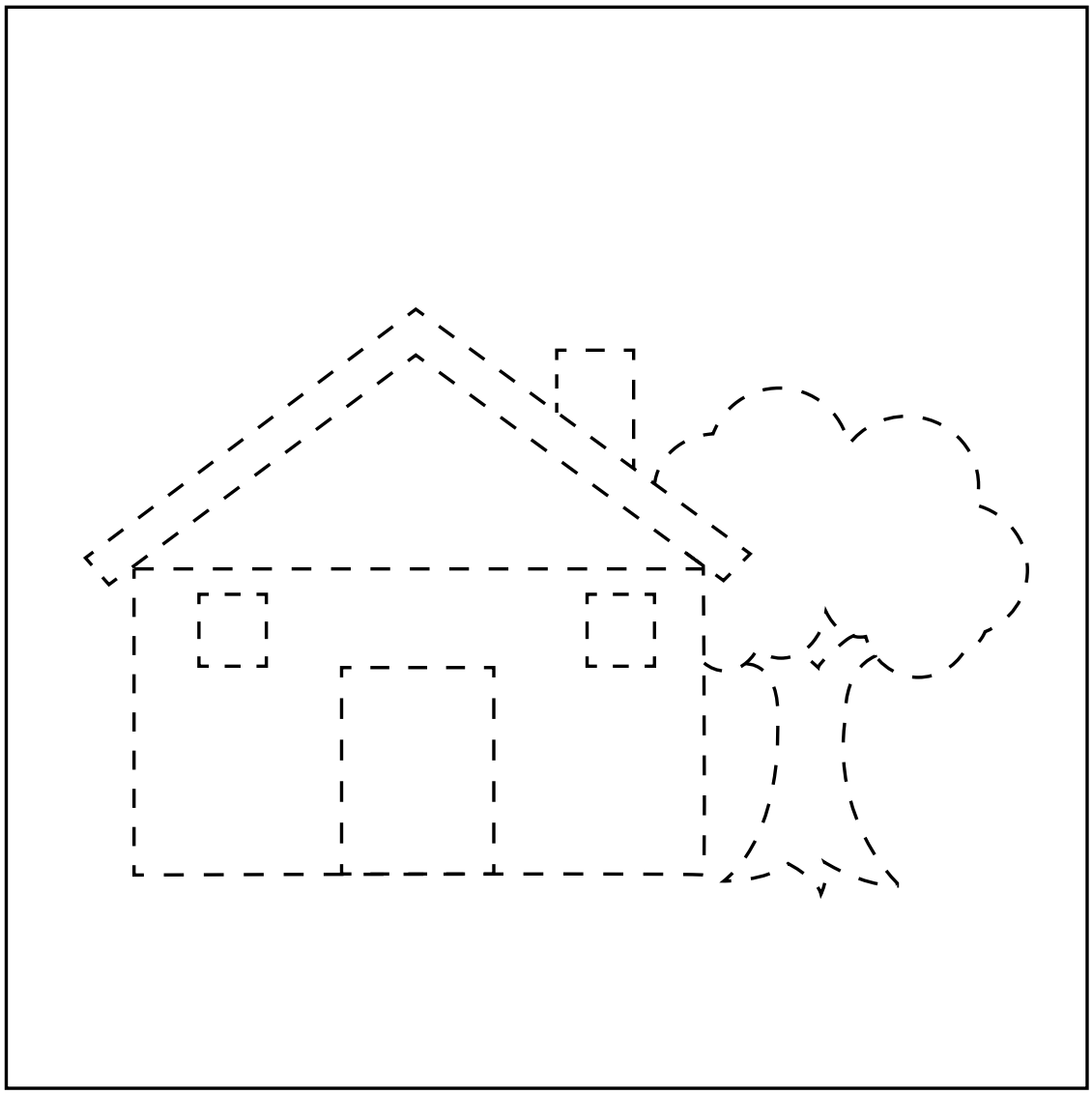
Sweet



Down

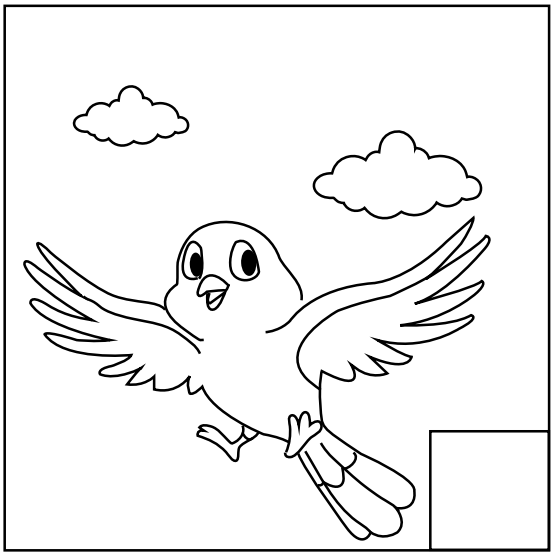
Worksheet 8

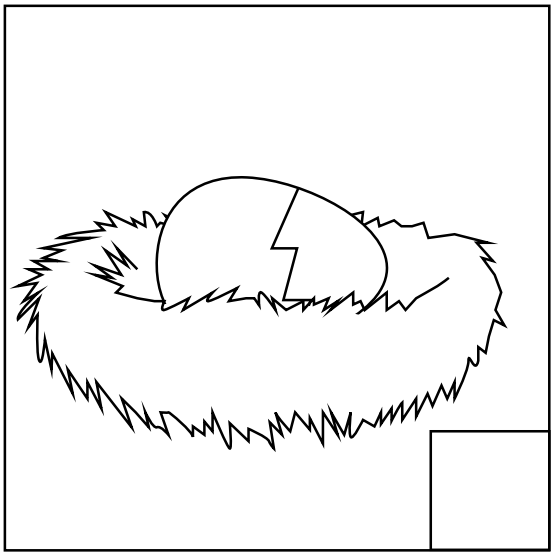
Trace the dotted line.
Colour the triangles red.
Colour the squares blue.
Colour the rest of the picture.

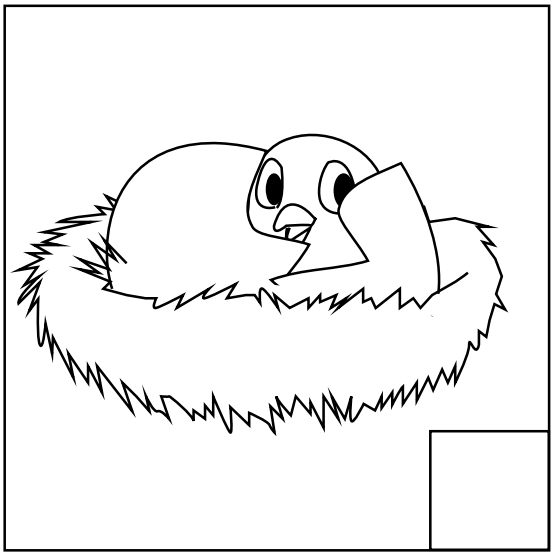


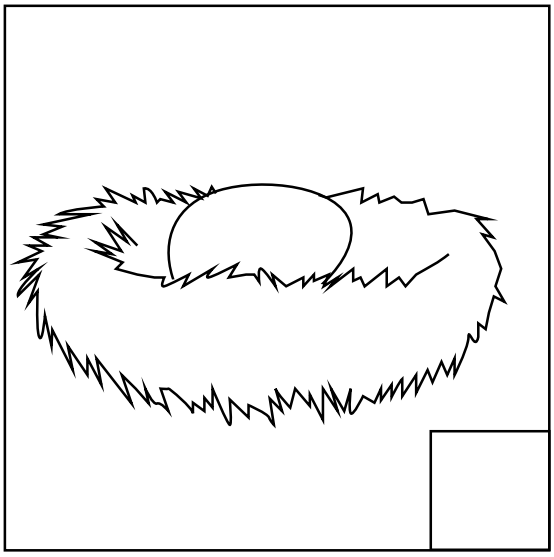
Worksheet 9

Number the pictures according to a sequence.



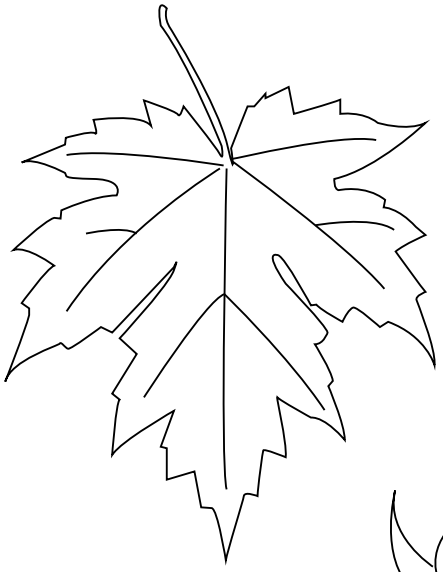


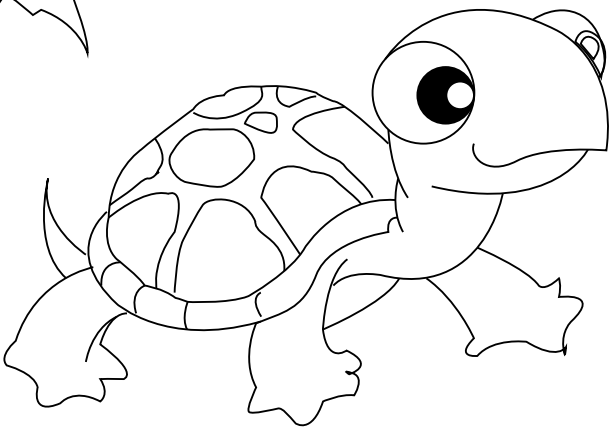


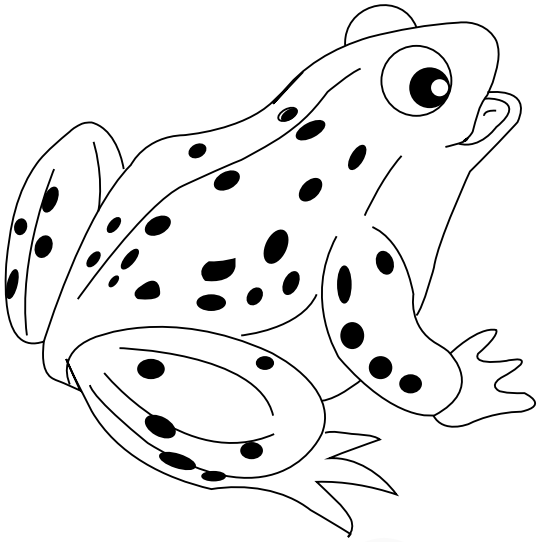


Worksheet 10

Colour these green.





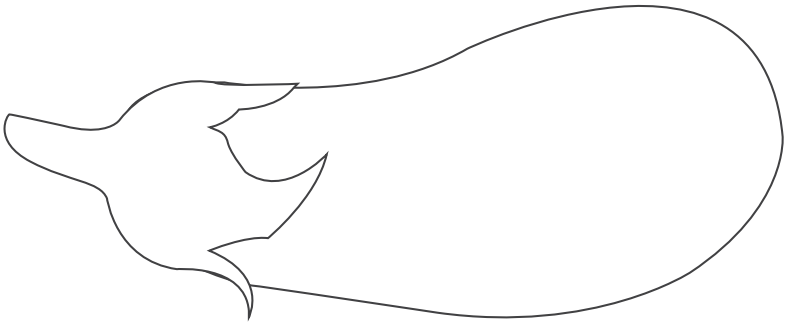


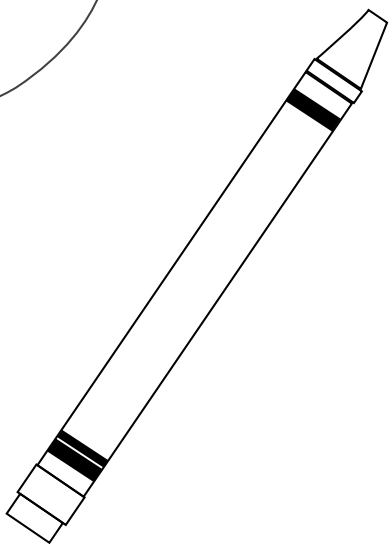
Worksheet 11

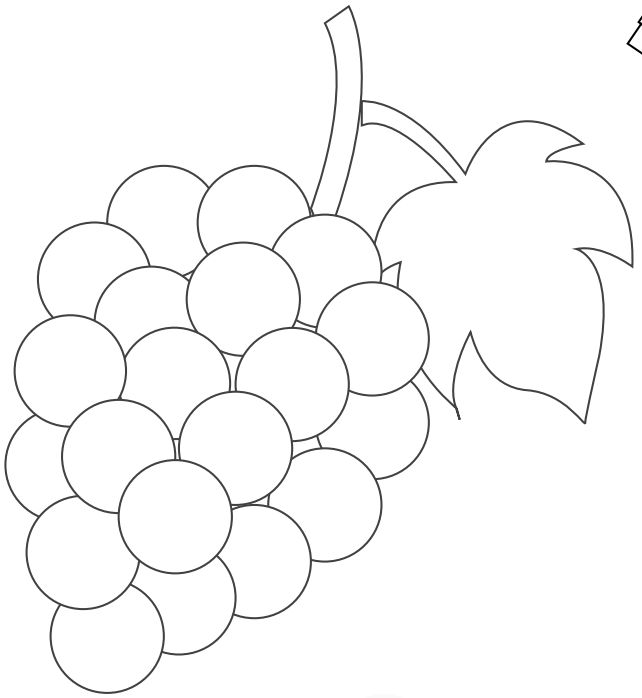
Colour these orange.

Worksheet 12

Colour these purple.

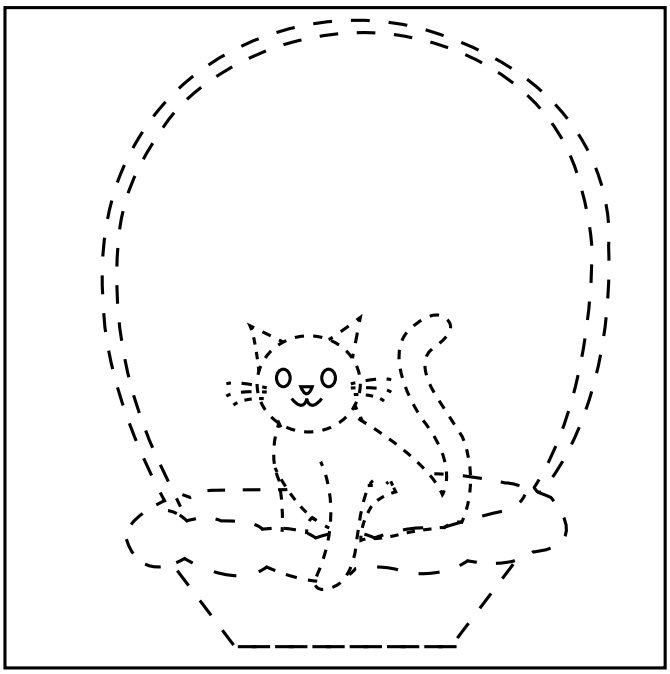


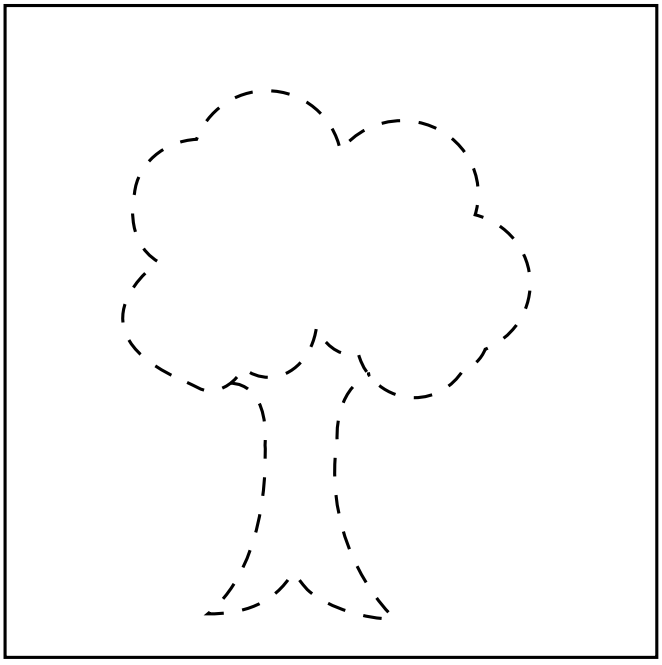




Worksheet 13

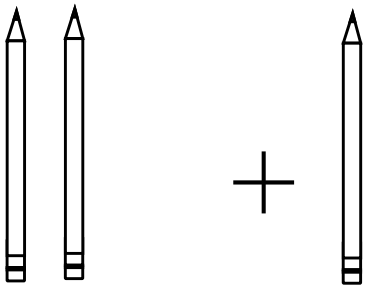
Trace over the dotted line. Colour the pictures.



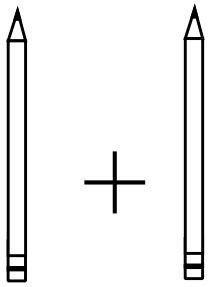


Worksheet 14

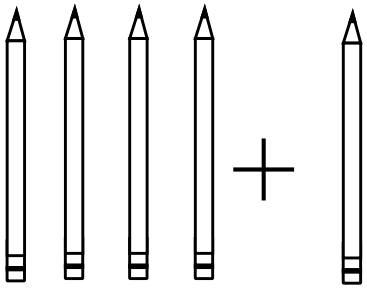
Addition.



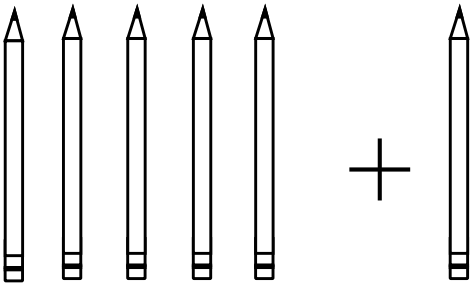
2+1=_____



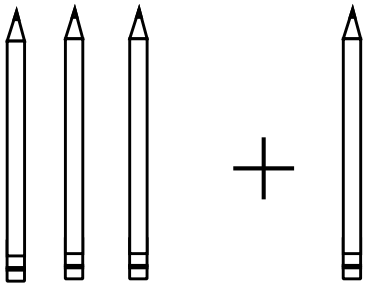
1+1=_____



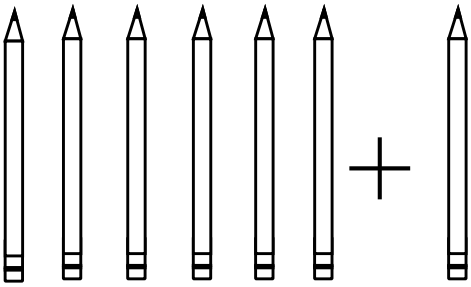
4+1=_____



5+1=_____



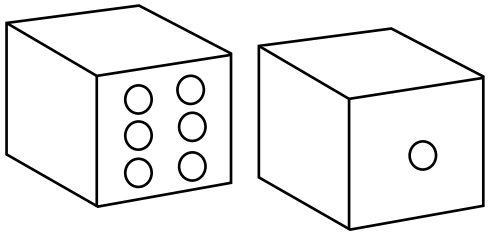
3+1=_____



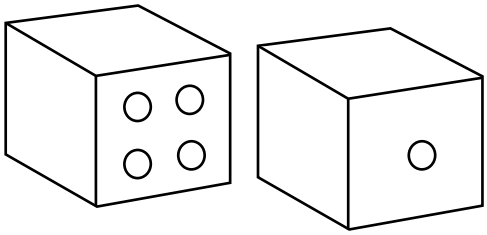
6+1=_____

Worksheet 15

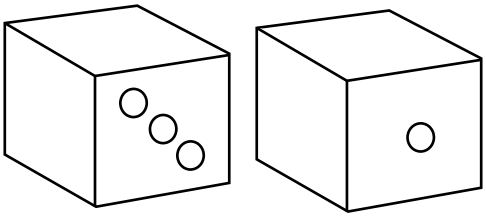
Addition with dice



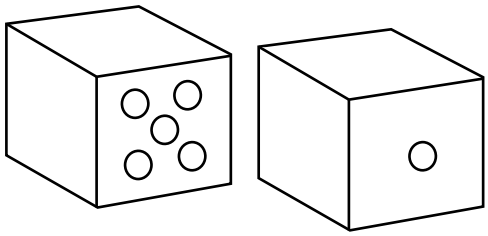
_____ + _____ = _____



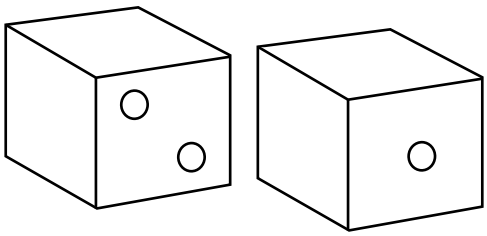
_____ + _____ = _____



_____ + _____ = _____



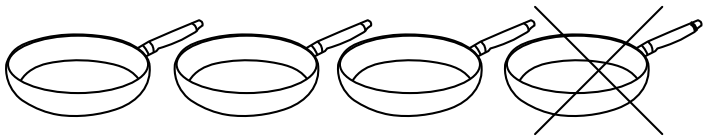
_____ + _____ = _____



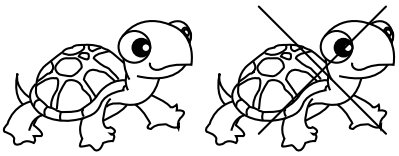
_____ + _____ = _____

Worksheet 16

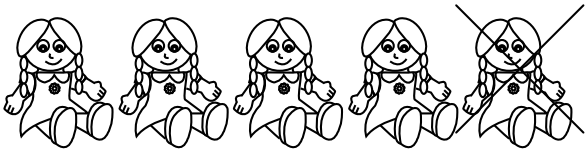
How many are left?



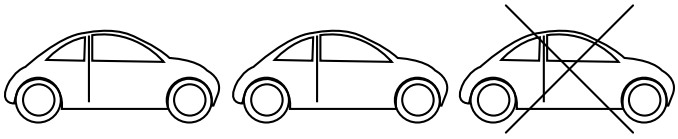
4 − 1 = ☐



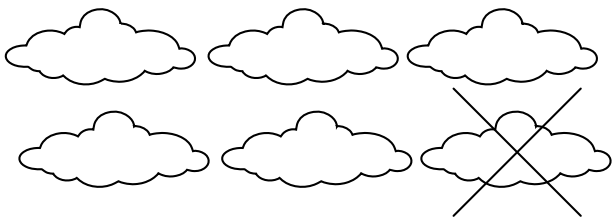
2 − 1 = ☐



5 − 1 = ☐



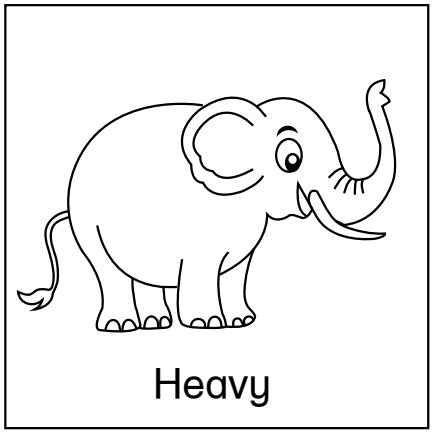
3 − 1 = ☐



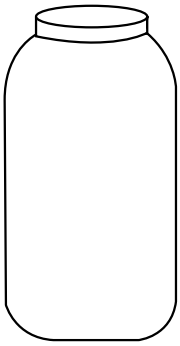
6 − 1 = ☐

Worksheet 17

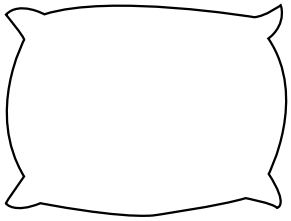
Opposites



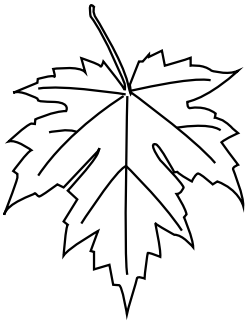
Heavy



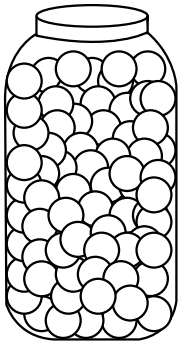
Empty



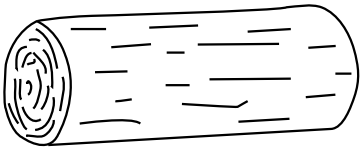
Soft



Light



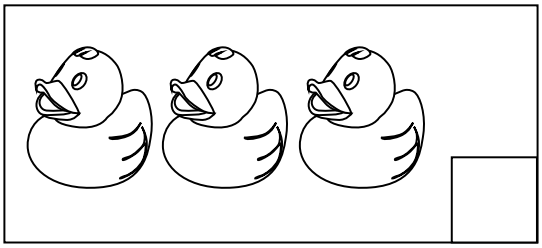
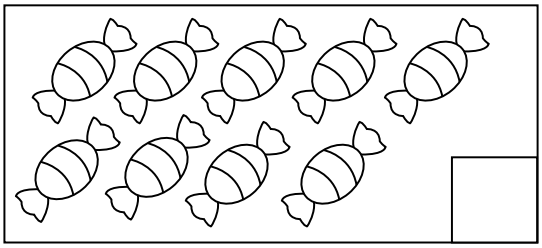
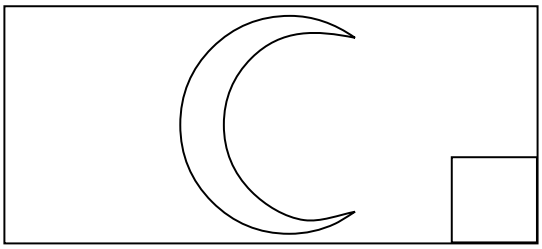
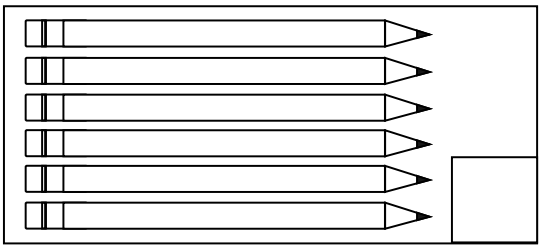
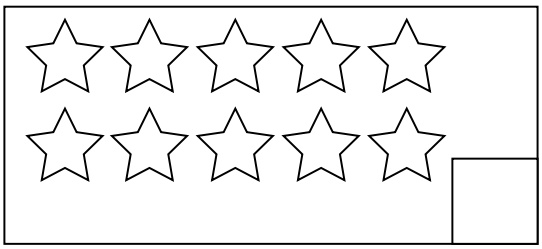
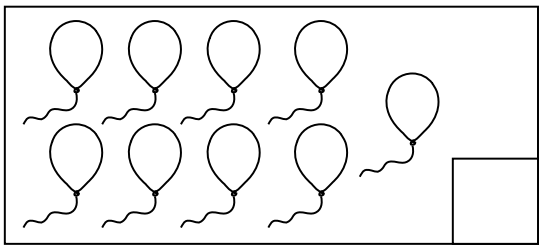
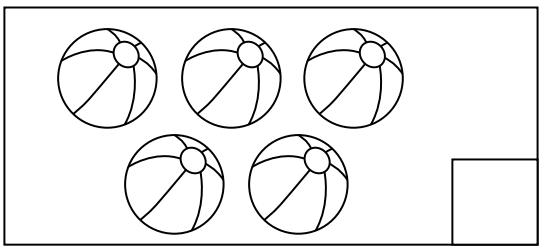
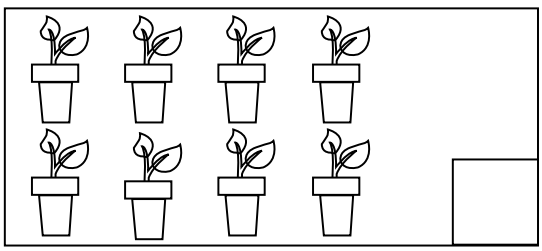
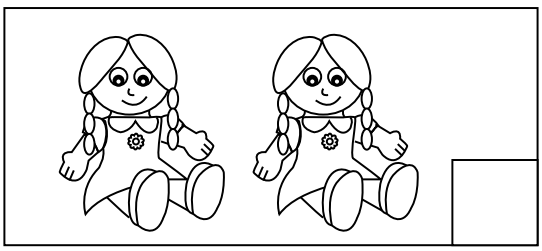
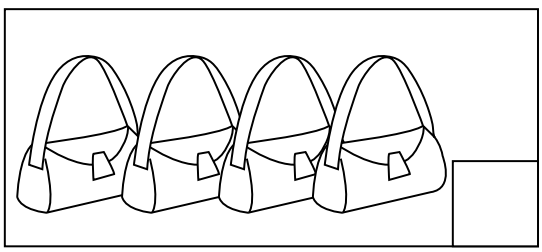
Full



Hard

Worksheet 18

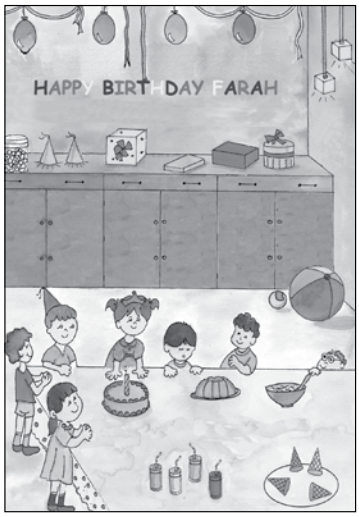
Count and write.

Solved Exercises: Introductory Book 2

Page 1

Count the shapes.



brick shapes 2

dice shapes 3

tin shapes 7

cone shapes 7

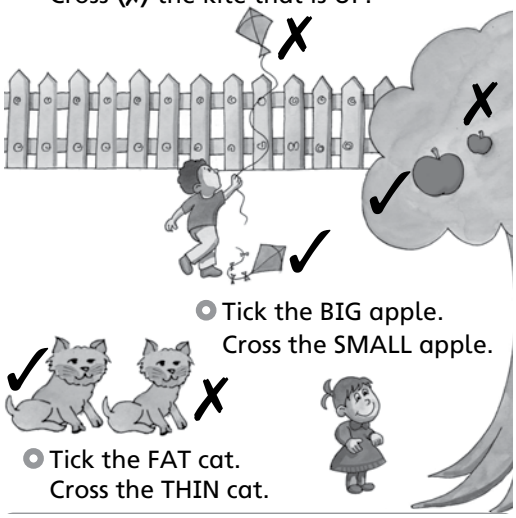
ball shapes 2

egg shapes 5

Page 2

Look for opposites.

Tick (✔) the kite that is DOWN.
Cross (✗) the kite that is UP.



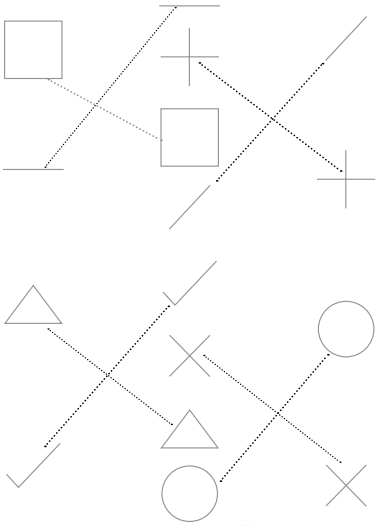
Tick the BIG apple.
Cross the SMALL apple.

Tick the FAT cat.
Cross the THIN cat.

Page 7

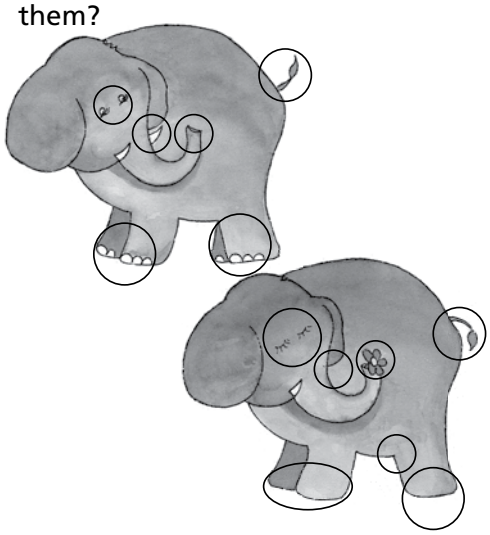
Match the symbols.

Trace over the symbols and draw lines to match the pairs.



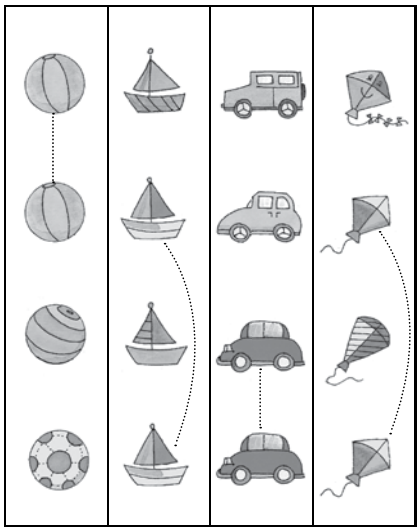
Page 9

There are 6 differences between Mumbo and Jumbo. Can you find them?



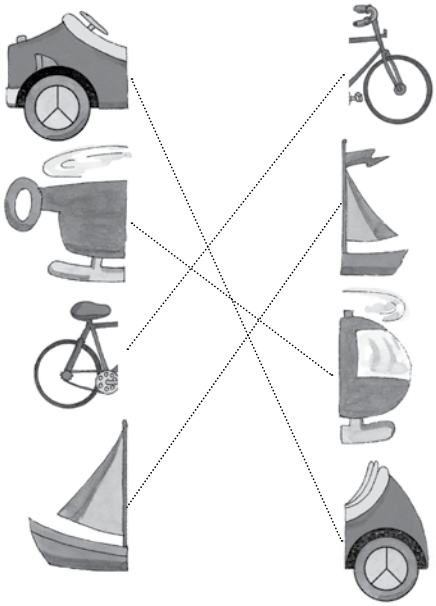
Page 10

- Find the identical pair in each set and join them as shown.



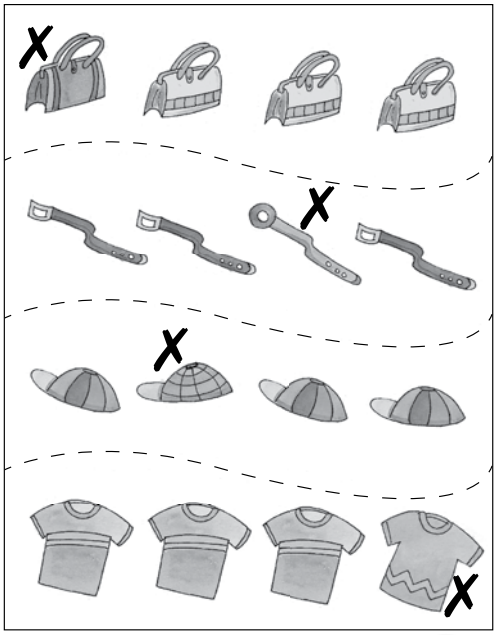
Page 11

- Join the halves of these toys to make them whole again.



Page 12

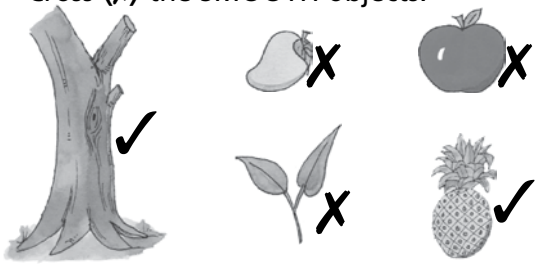
- Cross (✗) the odd one out in each set.



Page 13

ROUGH and SMOOTH

- Tick (✓) the ROUGH objects.
  Cross (✗) the SMOOTH objects.



- Count, and then write the number of:

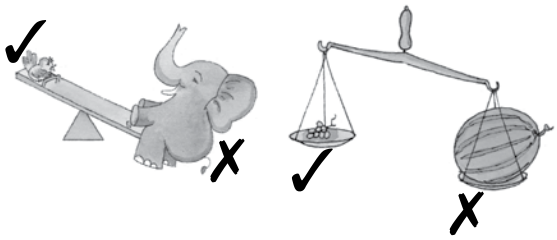
SMOOTH objects 3

ROUGH objects 2

Page 14

LIGHT and HEAVY

- Tick (✔) the LIGHT objects.
  Cross (✗) the HEAVY ones.



Page 15

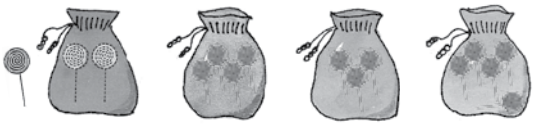
EMPTY and FULL

- Tick (✔) the FULL chest.

- Tick (✔) the EMPTY basket.

- Tick (✔) the FULL trolley.

- Three bags are EMPTY.
  Fill them with the number of lollypops shown.

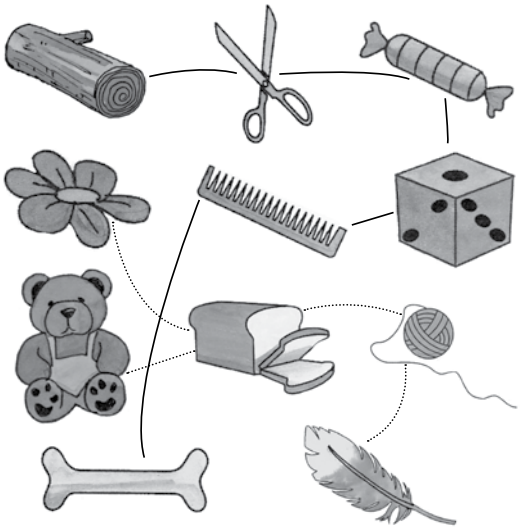


2 4 3 5

Page 16

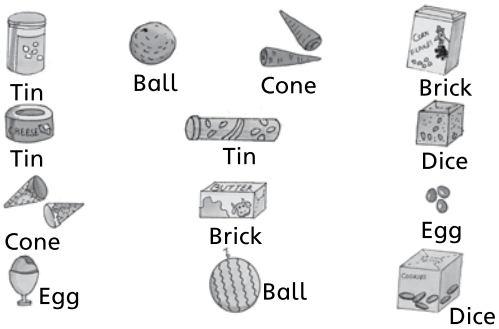
HARD and SOFT

- Draw a green line through all the objects that feel SOFT. Draw a blue line through all the objects that are HARD.

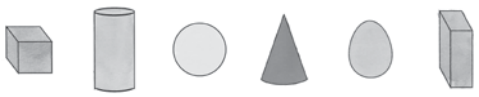


Page 19

- Can you name these shapes?



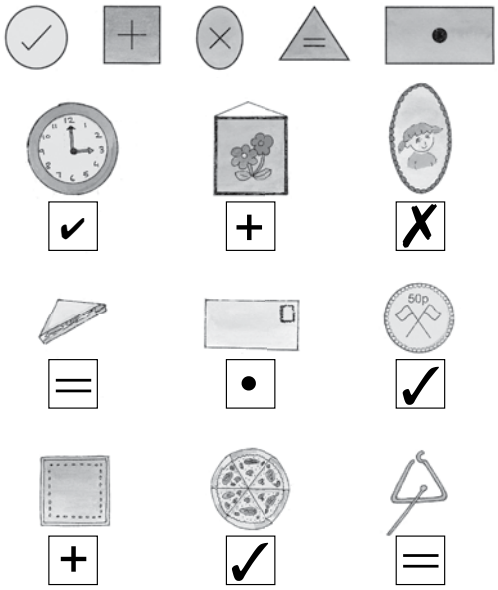
- Count how many of each shape and write the answers in the boxes below.



2	3	2	4	4	2

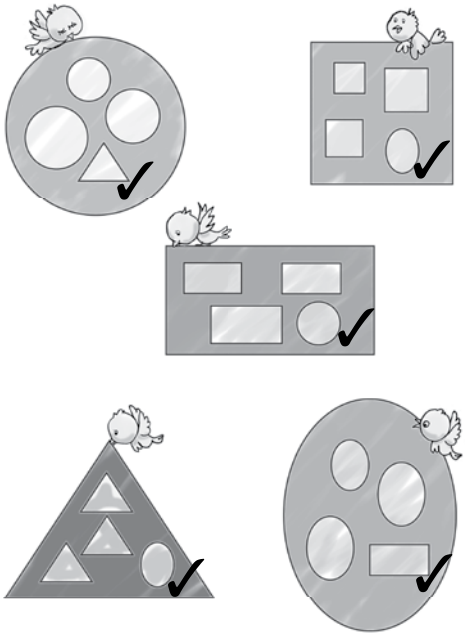
Page 21

Match the shapes.



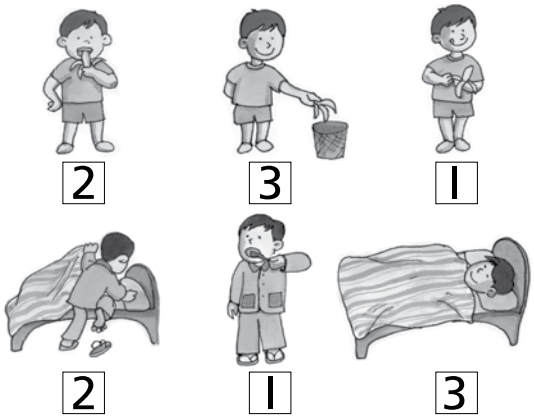
Page 22

Tick (✔) the odd one out.



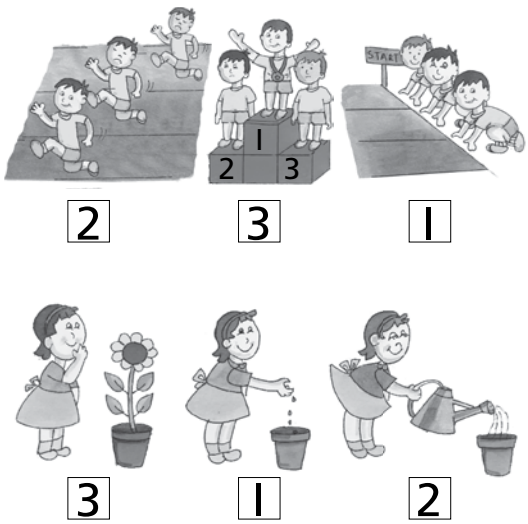
Page 24

What do you do first?
Write 1, 2, and 3 in the boxes.



Page 25

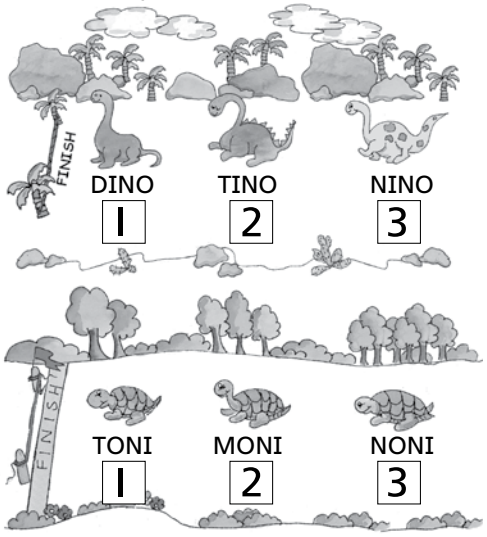
Write the correct sequence.



Page 26

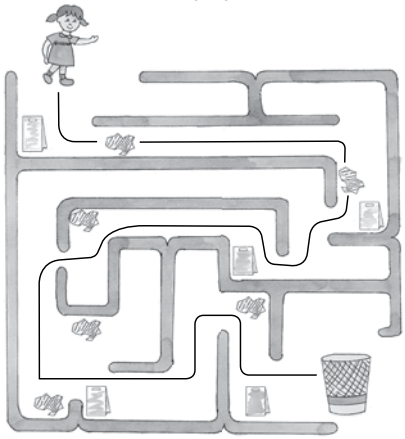
DINO and TONI win their races.

- Write the positions in the boxes.



Page 28

- Help Saneela collect the litter as she goes through the maze to reach the waste-paper basket.



Page 29

- Count how many green frogs there are and write the number in the box.

8

Page 30

- Count how many oranges there are and write the number in the box.

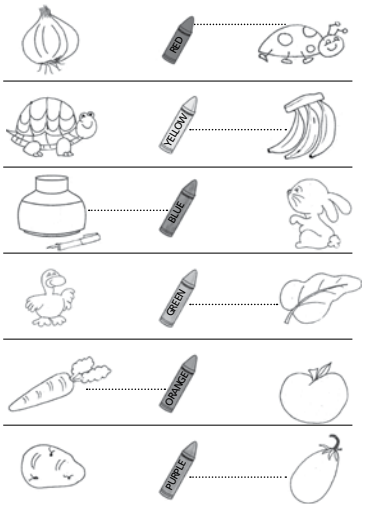
7

Page 31

- Count how many bunches of purple grapes there are and write the number in the box.

6

Page 32



Page 37

Size of sets

Tick (✔) the correct number for each set.

How many do you see? 1 2 3 5

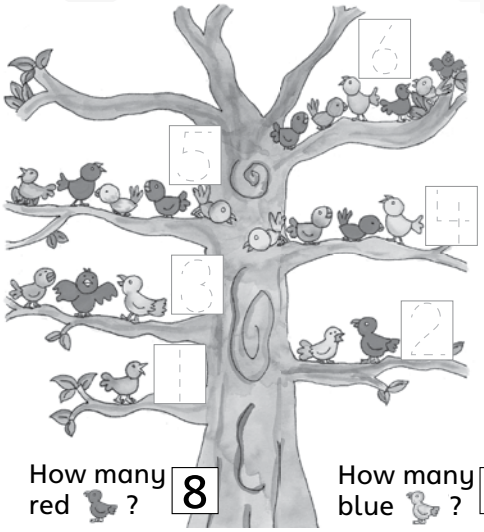
How many do you see? 4 1 2 3

How many do you see? 3 2 4 5

How many do you see? 2 3 4 1

How many do you see? 4 1 5 3

Page 38



How many red ? 8

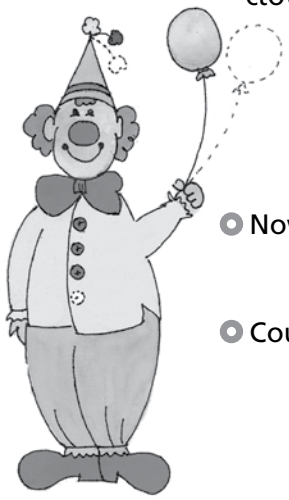
How many blue ? 6

How many yellow ? 6

Page 39

Addition

Look at Smiley, the clown. Count and write.



1

1

3

Now add one more.

Count again and write.

2

2

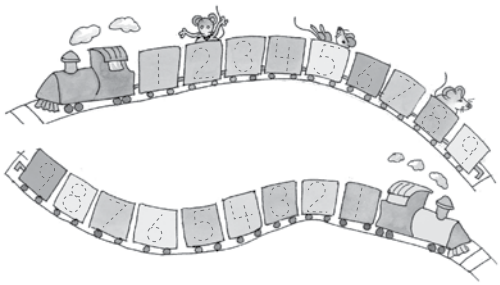
4

Complete the sum.

| + | = 2

Page 55

Look at the trains. Read and write the numbers on them.



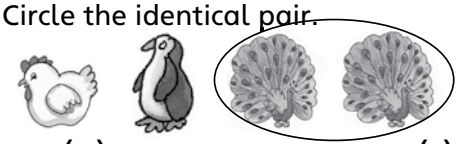
Write the missing numbers in the boxes.

0 1 2 3 4 5 6 7 8 9

9 8 7 6 5 4 3 2 1 0

Page 59

- Circle the identical pair.



- Tick (✓) the light object. Cross (✗) the heavy one.

- Add and write the answers to the sums:

$2 + 1 = \boxed{3}$ $\quad 6 + 1 = \boxed{7}$

$7 + 4 = \boxed{11}$ $\quad 5 + 2 = \boxed{7}$

Take away and write the answers to the sums:

$6 - 1 = \boxed{5}$ $\quad 7 - 1 = \boxed{6}$

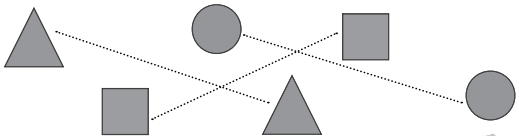
$5 - 1 = \boxed{4}$ $\quad 4 - 3 = \boxed{1}$

Page 60

- Count how many birds there are. Write the number in the box.

- Count how many flowers there are. Write the number in the box.

- Join the matching shapes.



Page 61

- Count how many butterflies.

- Count how many flowers.

- Count how many feathers.

- Count how many apples.

- Count how many fish.