Finding Mathematics

Textbook for Class I

Education Department
Government of Sikkim

N5B5Y7

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Foreword

Since the development of the primary level state term books in the year 2012 and subsequent revisions, a need to revisit our books was felt to align with the developments that have emerged in the ensuing years. For this, a series of intensive exercises were initiated by SCERT which included consultative engagements with practicing teachers and users of the textbooks; strengthening of a core textbook writing team and collaborating with external academic partners. The revised textbooks of Math, Language and Environmental Studies (EVS) are the successful outcome of these initiatives.

A pilot study of the textbooks was also carried out in 40 government schools from four districts in the academic session of 2019. An orientation of all the teachers was conducted prior to its implementation. Learning experiences from the pilot study was used to further improve the new revised textbooks.

The new textbooks are aligned to the following:

- the Learning Outcomes of the National Council of Educational Research and Training (2017)
- the integration of education for sustainable development (ESD) for the implementation of UN's 2030 agenda for sustainable development goals of education for peace and sustainable development
- the integration of environmental studies in language and mathematics in class I and II with the introduction of the subject of EVS from Class III.

The content of the books is embedded in the socio-cultural context and experiences of the children who come to our government schools. Care has been taken to represent the social, cultural and linguistic diversity of Sikkim. The National Curriculum Framework 2005 emphasizes the need for connecting school learning to the real lives of children and providing a fearless environment where every child feels safe to ask questions, explore and experiment without the fear of being wrong or judged. It is hoped that the schools will nurture this while providing opportunities to work collaboratively with each other.

From the perspective of education for sustainable development, the lessons encourage children to care for and respect the natural environment and people. It encourages children to think critically and creatively about what is happening in their local as well as the global community, connect with their community and to take action for improving it.

SCERT thankfully acknowledges the successful effort of the text book development team of writers, academic partners and reviewers. It also thanks the school heads and officials from Education Department, Govt. of Sikkim for their continuous support.

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It also thanks the team from UNESCO, MGIEP, New Delhi for their contribution in the capacity development of authors for embedment of the concept of peace and sustainable development in textbooks and online support. It owes special thanks to David Richard Wagner, Professor, University of Brunswick, Canada.

SCERT would also like to thank the following for their resources and content: NCERT for their reference materials and documents; UNESCO MGIEP for their publication Textbook for Sustainable Development (www.mgiep.unesco.org) which was used as a key resource for embedding of Sustainable Development.

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It also acknowledges the contribution of Echostream Design Pvt. Ltd. for designing the textbooks and providing suitable illustrations.

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Note to Teachers and Parents

This textbook is based on the recommendations of National Curriculum Framework (NCF) 2005 and the Learning Outcomes suggested by the NCERT. It is heavily inspired by the NCERT textbook. This textbooks embeds mathematics in the world of the child, inside and beyond the school. It aims to help children engage with mathematics, construct their own knowledge and think mathematically. Topics are introduced with contexts so that children can see the need and benefit of learning something new. Illustrations, dialogs, activities, games, puzzles and stories have been used to engage children in discovering mathematics around them, figuring out rules (rather than prescribing them), finding alternate ways and having fun. The focus is on developing conceptual understanding rather than only drill and practice. The chapters and the teacher pages include examples of suitable manipulatives and materials to help children play with mathematics and have better grasp on this subject. A strong foundation of conceptual understanding in mathematics at primary level will pave the way for future learning.

The textbook provides autonomy to the teachers to design activities and suitable assessment methods and tools. The teacher pages for selected chapters provide suggestions for the same as well as guidance for suitable materials and manipulatives. The teacher pages provide suggested activities that foster conceptual understanding in children.

This new set of textbooks for Classes 1-5 guide children to find and develop mathematics through their experiences. The books focus attention on local culture and environment in Sikkim. They use stories and contexts relating to sustainable development following the United Nations' Sustainable Development Goals (SDGs). When children's understanding of mathematics develops through problems relating to peace, health, hygiene, food security, and other social and environmental concerns, they learn that mathematics is a set of tools developed and used by humans to address their concerns.

Children will develop familiarity with rural and urban life including local plants, animals and human activity) by observing, collecting data, and processing these things mathematically. They will use local games, celebrate special days, notice mathematics done traditionally (e.g., local forms of measurement), and use local materials to extend their understanding of mathematics. They will develop sensitivity to the needs and practices of diverse people in Sikkim (gender, religion, etc.) and honour the dignity of labour through stories of real people who do mathematics. Children will learn to take responsibility in their communities and their environment through dialogue and problem solving.

This textbook's focus on local context and experiences of children addresses concepts and skills of EVS.

The authors of this book would like to express their deep gratitude to Jodo Gyan (http://jodogyan.org/), Padmapriya Shirali for her Pullouts in At Right Angles (http://azimpremjiuniversity.edu.in/SitePages/resources-at-right-angles.aspx) and Prof. Rohit Dhankar and Digantar. Several aspects of this textbook was also influenced by Maria Montessori and her work.

Class 1: Learning Outcomes

The child will be able to:

1. Use spatial relationship and vocabulary based on observable properties such as inside-outside; biggest-smallest; top-bottom; nearer-farther; on- under; above- below; thick-thin
2. Classify objects into groups based on a few physical attributes such as shape, size and other observable properties including rolling and sliding
3. Describe the above physical features of various solids/ shapes in their own language. For example: A ball rolls, a box slides, etc.
4. Consolidate number sense up to 20 –
   a. Count objects, concretely, pictorially and pick up correct number (1-20) of objects from a bigger collection
   b. Read and write numerals
   c. Compare numbers
   d. Automatize number combinations of 10 (1 and 9, 2 and 8, etc.)
   e. Construct addition facts up to 9 by using concrete objects. For example: To find 3 + 3, count 3 steps forward from 3 and conclude that 3 + 3 = 6
   f. Subtract a smaller number from a larger one, in the range 1-20. For example: The child takes out 3 objects from a collection of 9 objects and counts the remaining to conclude 9 – 3 = 6
   g. Solve day to day problems related to addition and subtraction of numbers up to 20
5. Understand the concept of zero
6. Recognise and count numbers up to 100 and write numerals up to 100
7. Identify currently used currency in India (₹1, ₹2, ₹5, ₹10, ₹20, ₹50, ₹100)
8. Make money combinations up to ₹20
9. Estimate and measure short lengths using non-uniform units such as finger, hand span, length of a finger, forearm, footstep, etc.
10. Compare objects – longer-shorter; taller-shorter; longest-shortest; tallest-shortest; thicker-thinner; thickest-thinnest
11. Distinguish between light and heavy objects
12. Arrange familiar events in the correct sequence of occurrence
13. Compare events based on their duration
14. Collect, record (using pictures/ numerals) and interpret simple information by looking at visuals
15. Interpret ‘more’ and ‘less’ from data
16. Observe, extend and create patterns of shapes and numbers, for example:
    a. Δ○○Δ ○○
    b. 1, 2, 3, 4, 5...
    c. 1, 3, 5...
    d. 2, 4, 6...
    e. 1, 2, 3, 1, 2, __, 1, __, 3,

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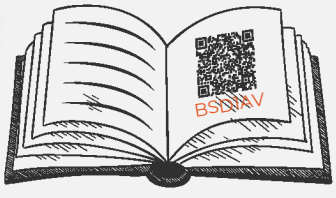
① 

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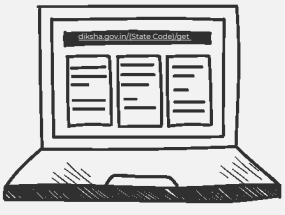
② 

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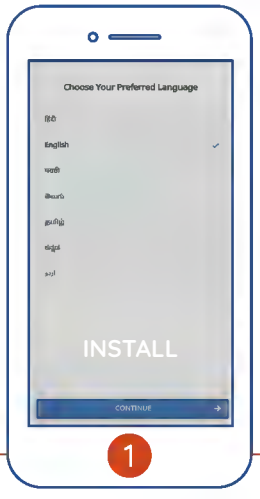

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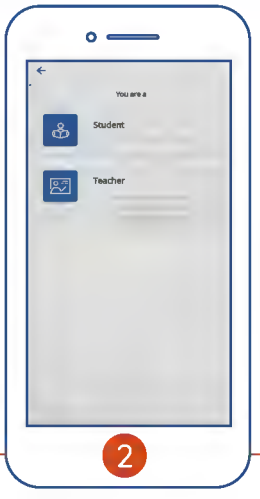

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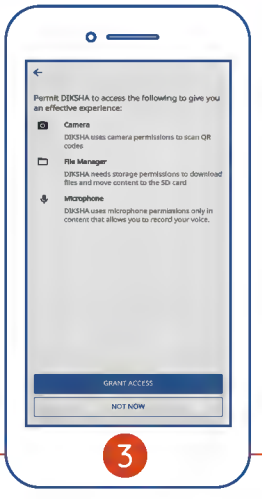

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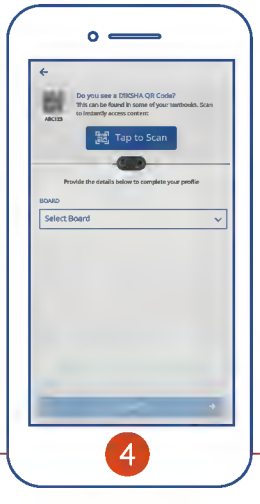

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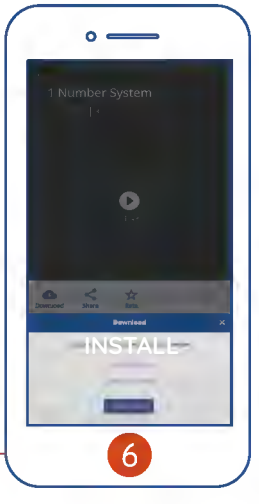

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1. Looking Around

I2K7S7

Inside-Outside

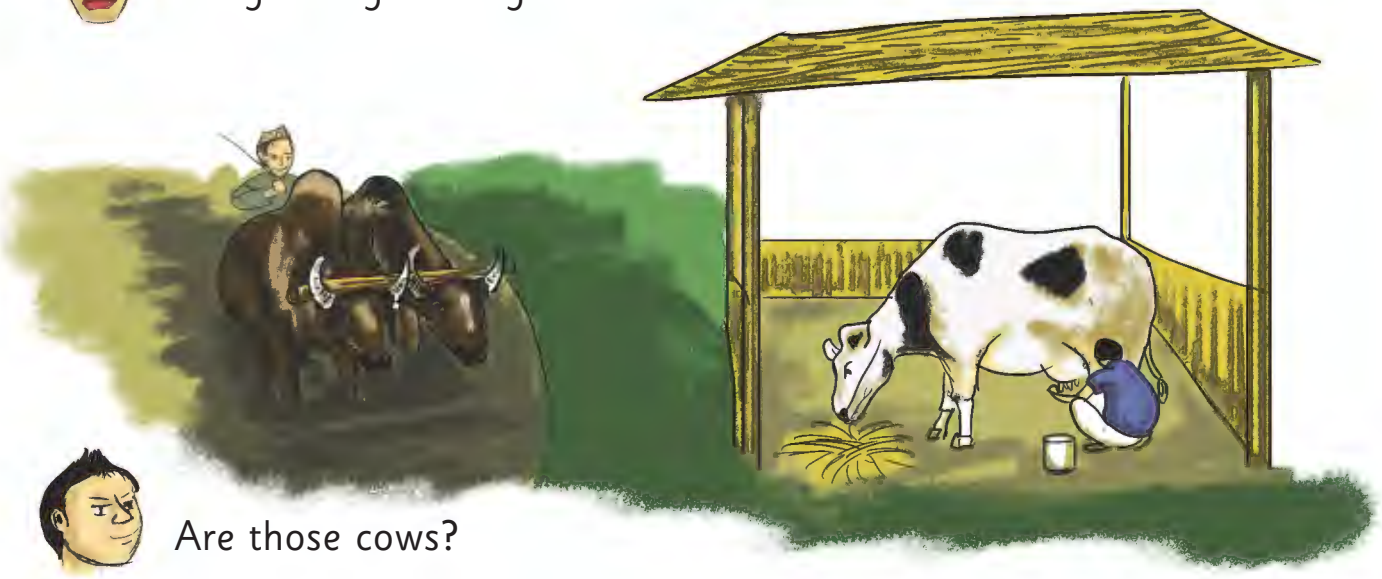
It is summer vacation. Gopal and his parents are visiting their village. He will meet his grand parents and relatives. Gopal is happy. He can play outside.

1. Gopal and his parents are _____ (inside/outside) the bus.

2. Trees are _____ (inside/outside) the bus.

Papa, are they playing?

No, they are working in the field. They are growing the vegetables we eat.



Are those cows?

No, they are oxen. Cows are there inside the cow shed and oxen are outside ploughing the field.

Teacher's Note: Get children to look at the picture and identify what is inside and what is outside the cow shed.

Let us go and feed grains to the hens that are outside.

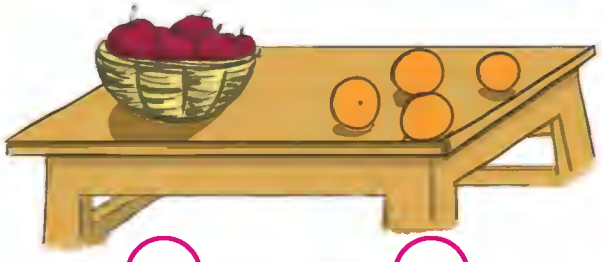
Where are the grains?

They are inside the bag.

Teacher's Note: The teacher will read aloud the story. She will ask the following questions: Which animals are inside? Which animals are outside? Can you name some daily activities which we do inside our home?

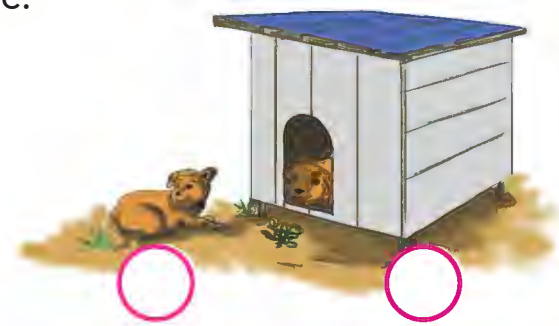
3. Tick ✓ things which are outside

a.



b.

c.



d.

4. Tick ✓ things which are inside

a.

b.

c.

d.

Teacher's Note: The last one can be used to discuss: What is inside the car? What is inside the bag? What is outside the bag? These will help children understand that a thing can be outside something (the bag) but inside another thing (the car).

Bigger and Smaller

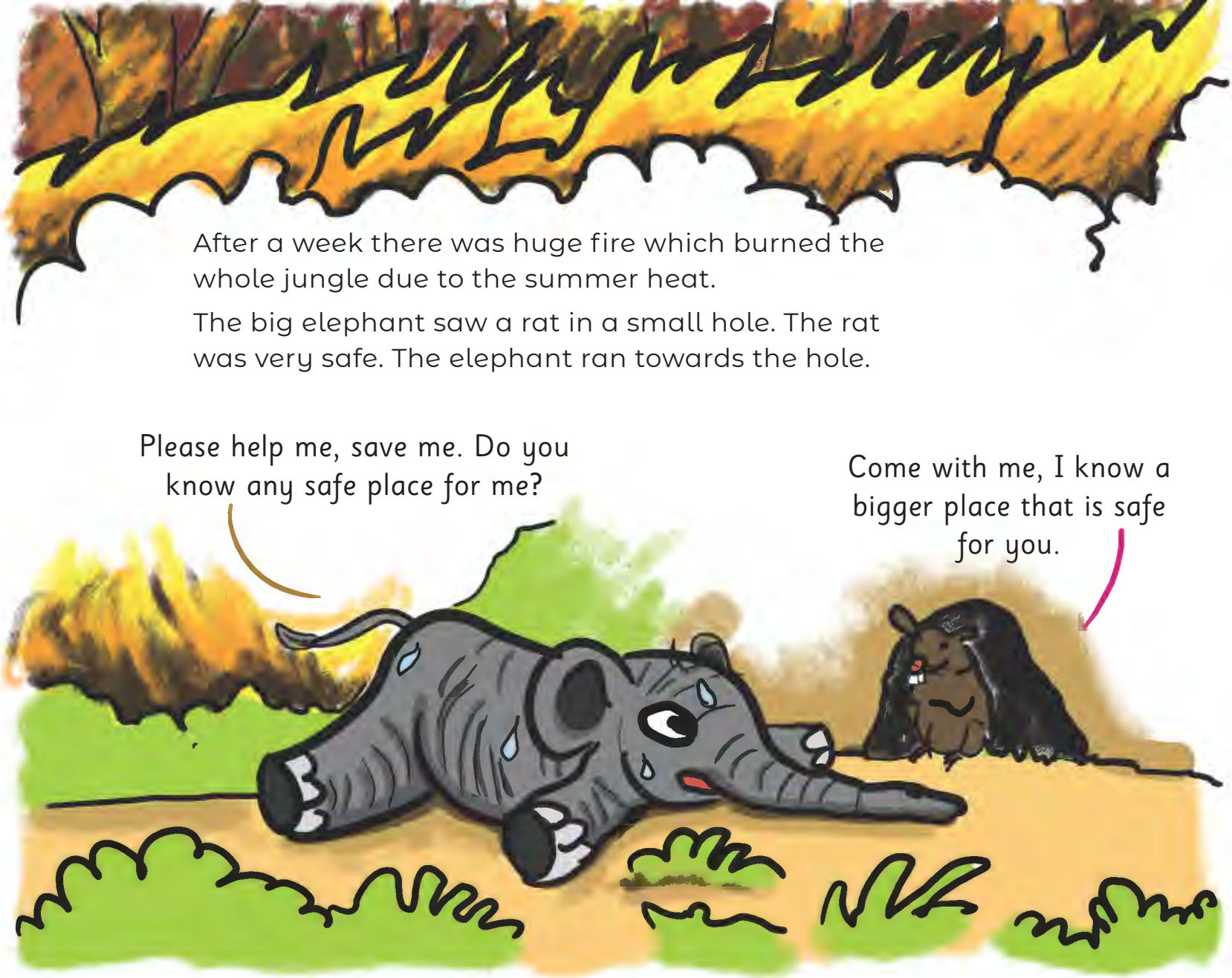
The elephant is a big animal. He is very proud.

Can you help me to find food?

You small fellow, go away. I will not help you.

After a week there was huge fire which burned the whole jungle due to the summer heat.

The big elephant saw a rat in a small hole. The rat was very safe. The elephant ran towards the hole.



He helped the elephant to reach a safer place.

smaller

bigger

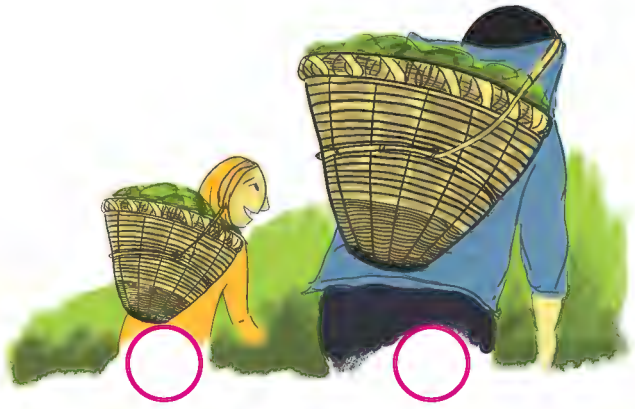
I have a big bundle of firewood my mother will be happy today.

I have a small bundle of fire wood but still we can cook our food.

1. Tick ✓ the bigger one

a.

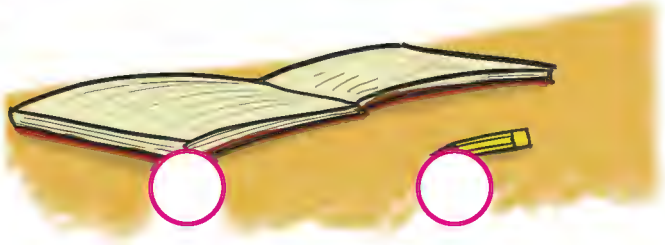
b.



2. Tick ✓ the smaller one

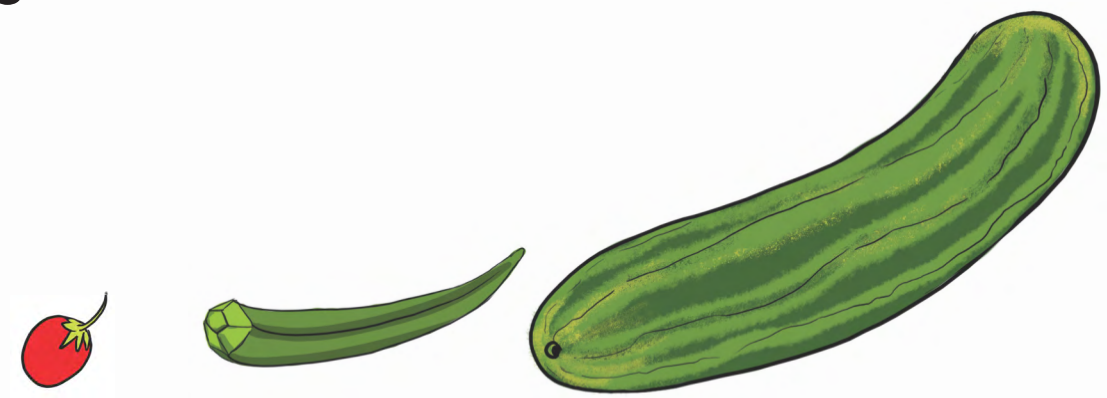
a.

b.



3. Draw a balloon bigger than this one

Biggest and Smallest

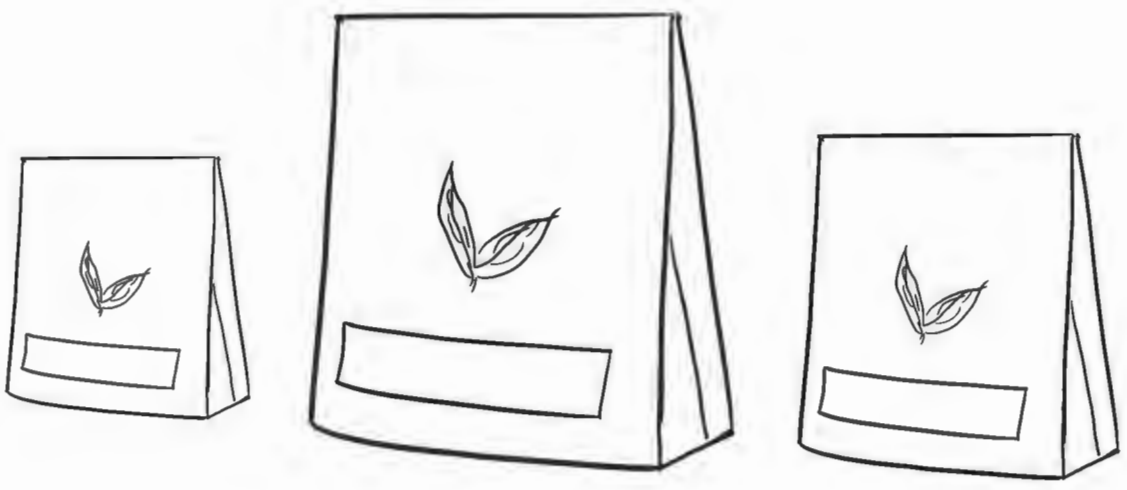


smallest

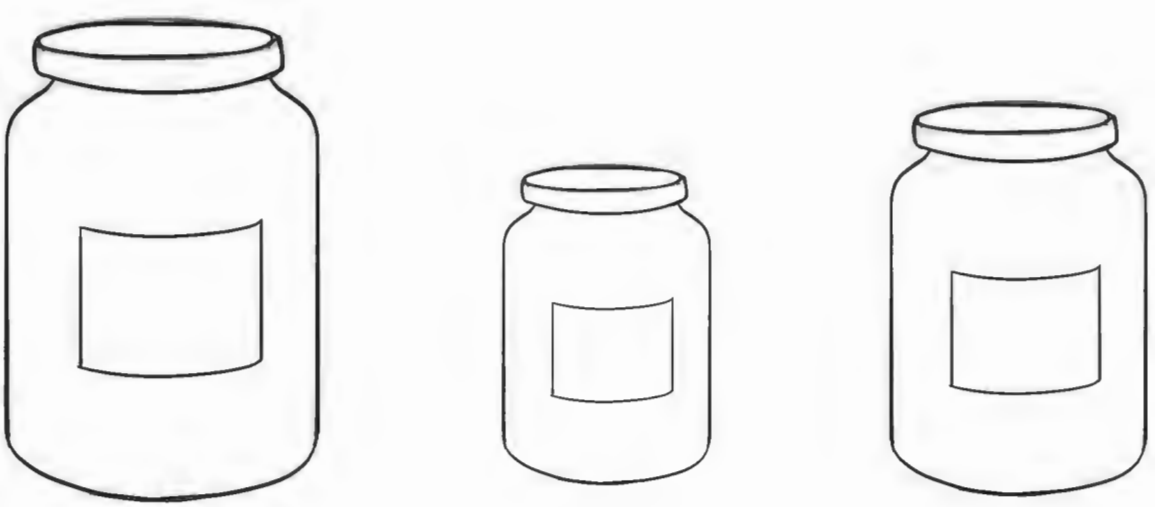
biggest

1. Let's colour :

a. Colour the biggest box of tea leaves

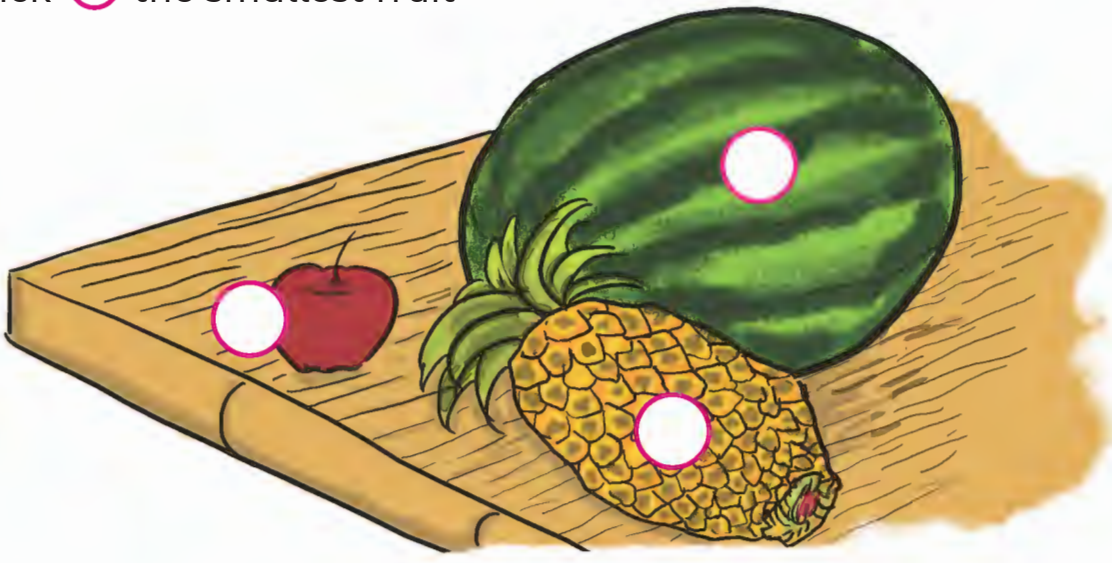


b. Colour the smallest bottle of pickle



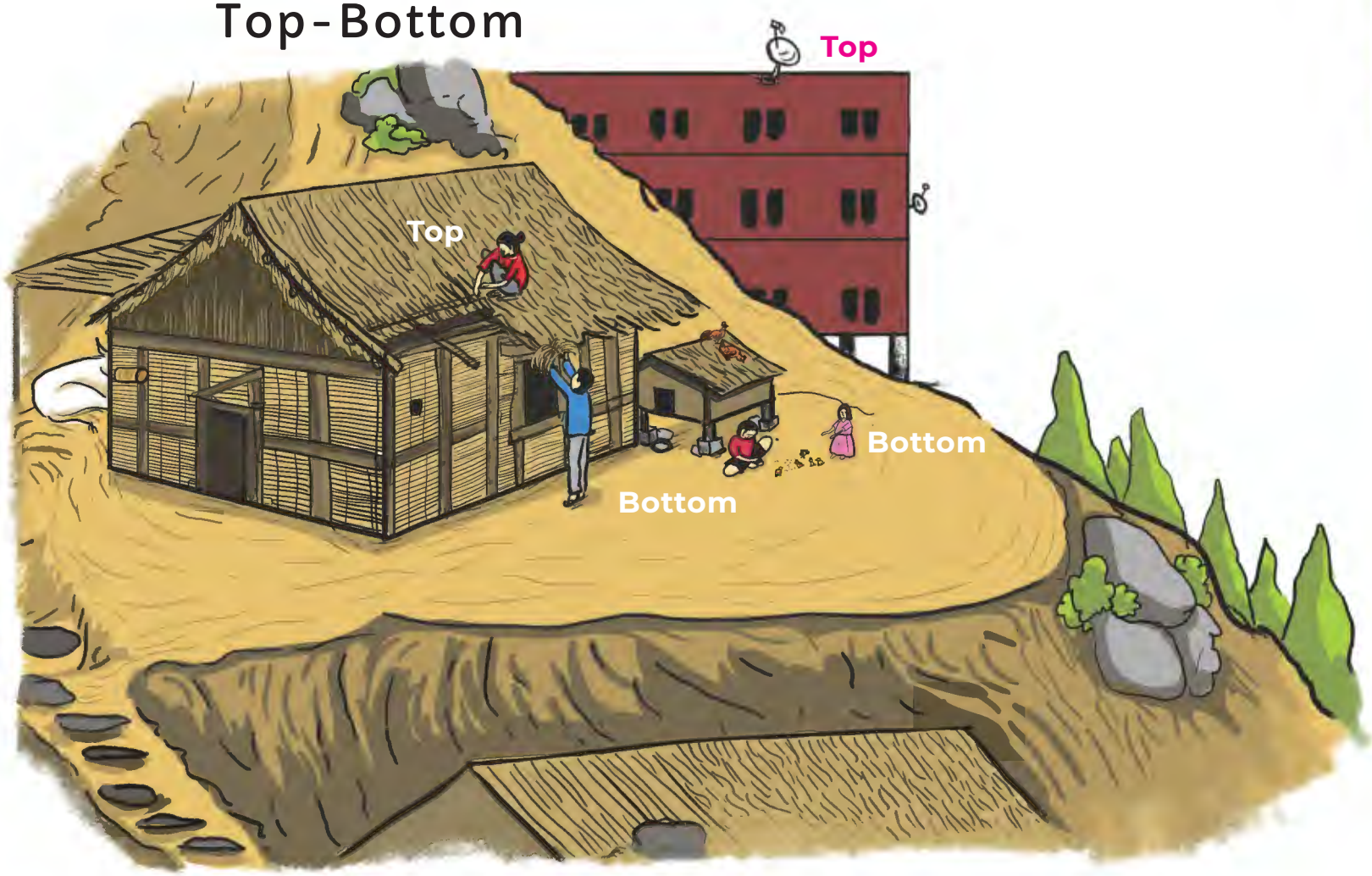
2. Tick ✓ the biggest animal

3. Tick ✓ the smallest fruit



4. Colour the smallest mat in red and the biggest mat in green

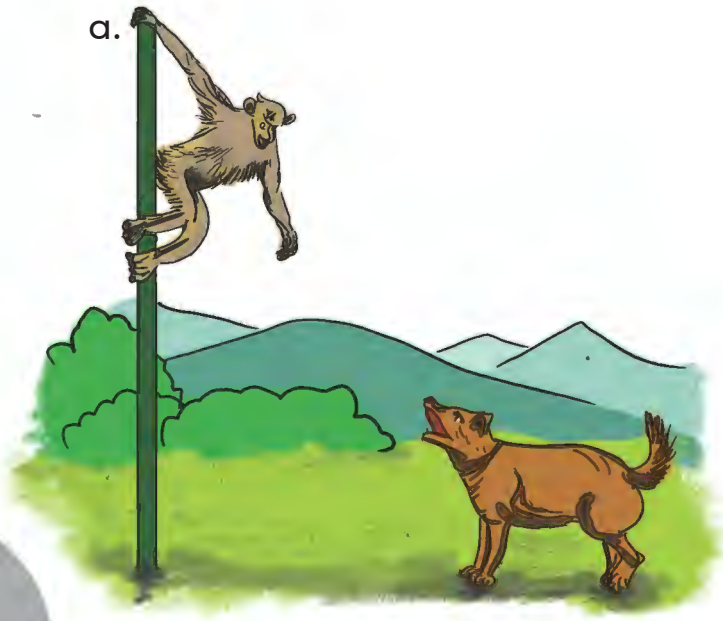
Top-Bottom



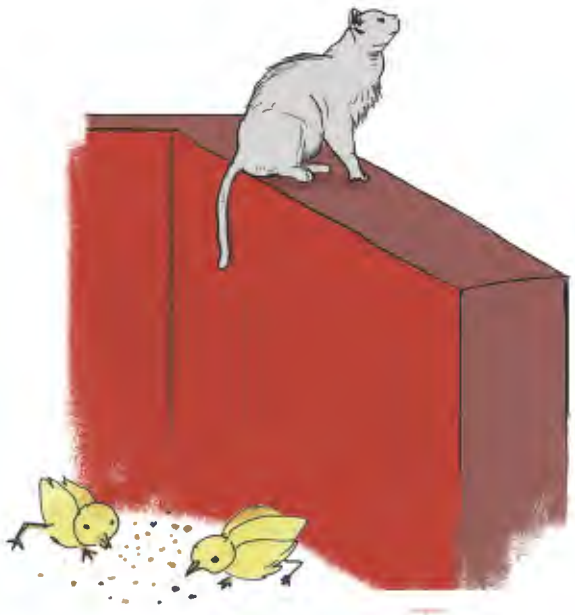
Teacher's Note: Encourage the children to locate positions of various things in the picture by asking questions like: Where are the cocks? Where are the hens? Where is the man standing?

1. Circle the things which are on the top

a.

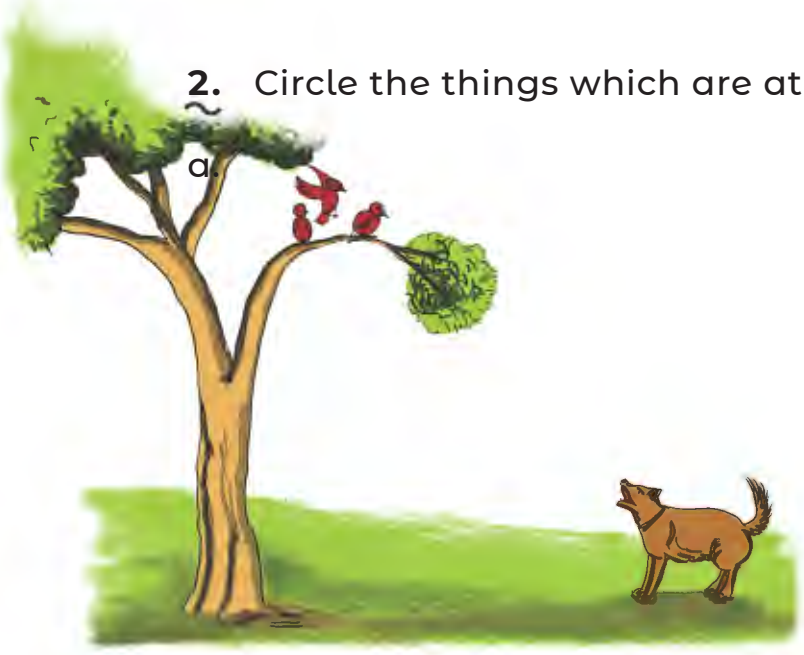


b.



2. Circle the things which are at the bottom.

a.

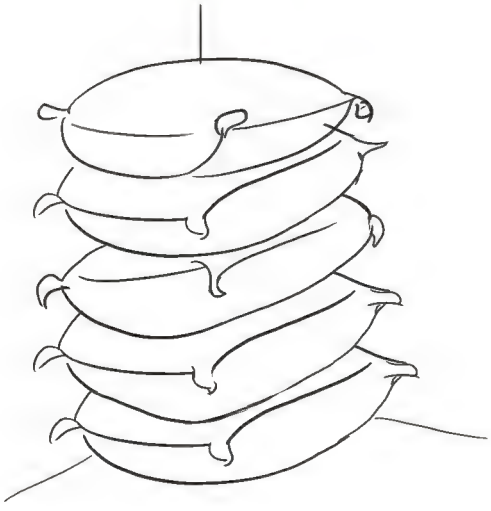


b.

3. Colour the top one.

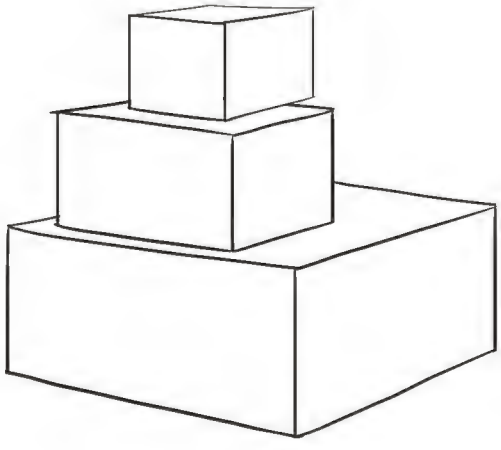
a.

b.



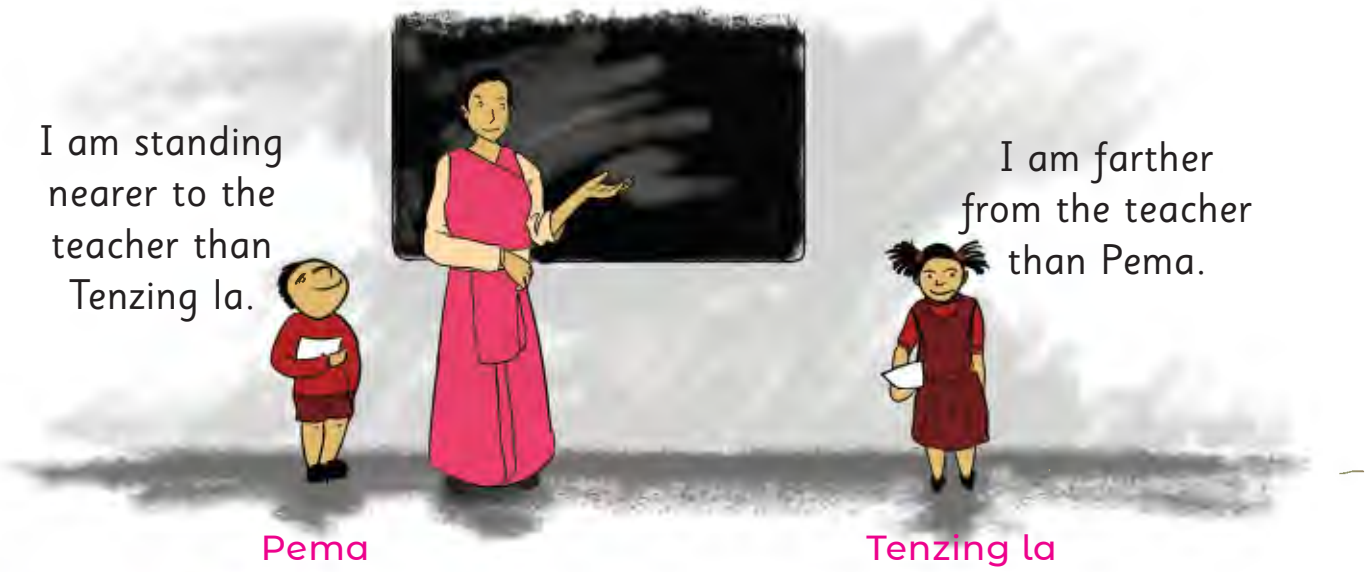
4. Colour the bottom one.

a.



b.

Nearer-Farther



Nearest-Farthest

1. Write the correct answer in the spaces given.

a. The boy is _____ (nearest to/farthest from) the dustbin

b. The lady is _____(nearer to/farther from) the dustbin.

c. The grey duckling is _____ (nearer to/farther from) mother duck than the yellow duckling.

d. The grey and yellow duckling is _____ (nearest to/farthest from) the mother duck.

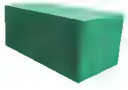
On-Under, Above-Below

Teacher's Note: Teacher to discuss the positions of various people, animal and birds with respect to bench, grass, tree etc, for example: The dog is sleeping under the bench. Relate this to the classroom environment and get children to use the words: on-under; above-below.

Sorting

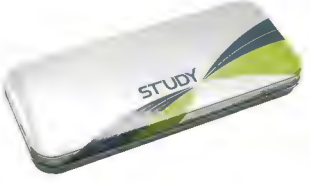
1. Tick ✓ the shape similar to

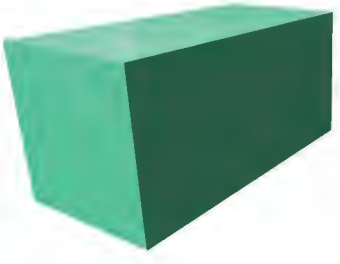
2. Tick ✓ the shape similar to

3. Tick ✓ the shape similar to 

4. Tick ✓ the shape similar to

5. Match me with the right shape

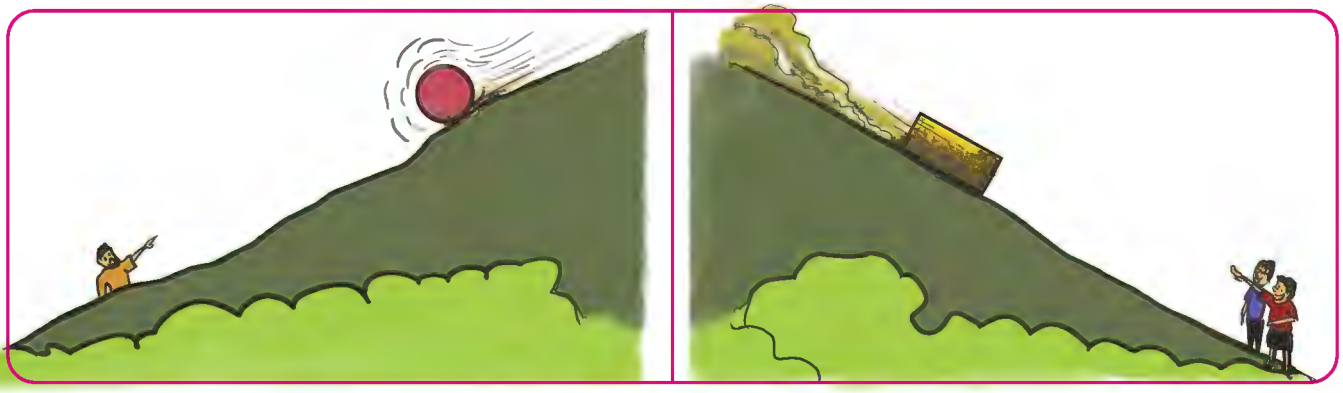


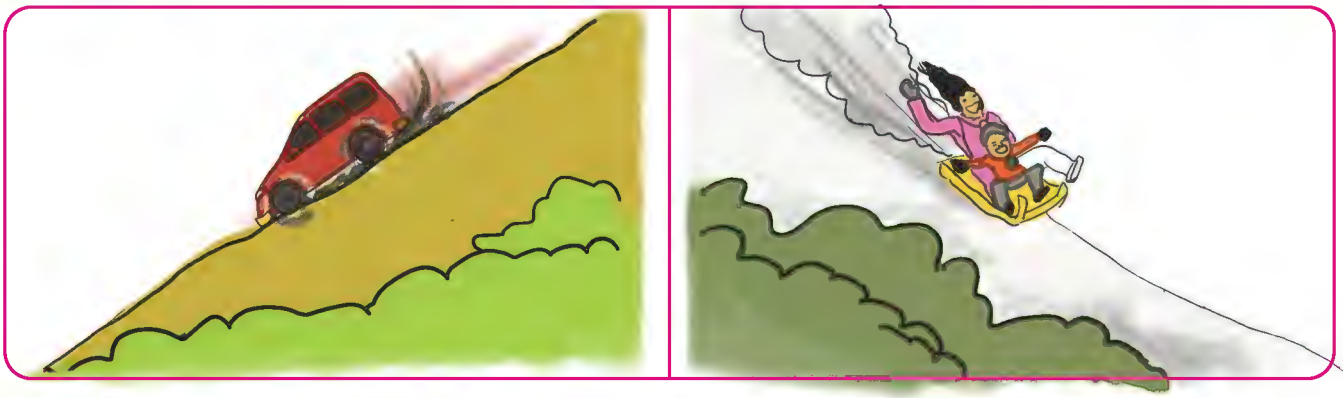


Teacher's Note: Get children to collect things from the surroundings (like rubber, pencil, sharpener, ruler, book, pencil, and pencil box, coins water bottles etc. and sort them as above).

Am I a cylinder?

Rolling and Sliding





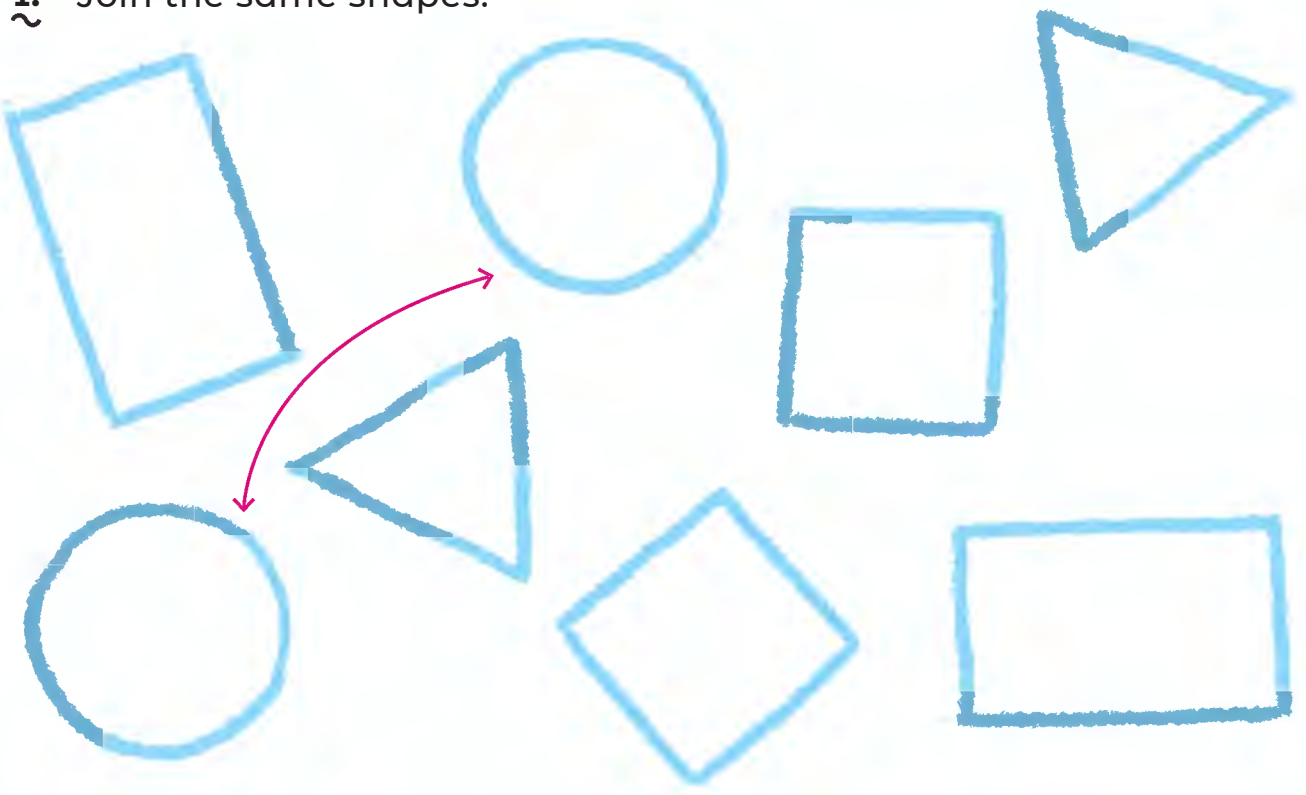
1. Tick ✓ the objects that roll

2. Tick ✓ the objects that slide

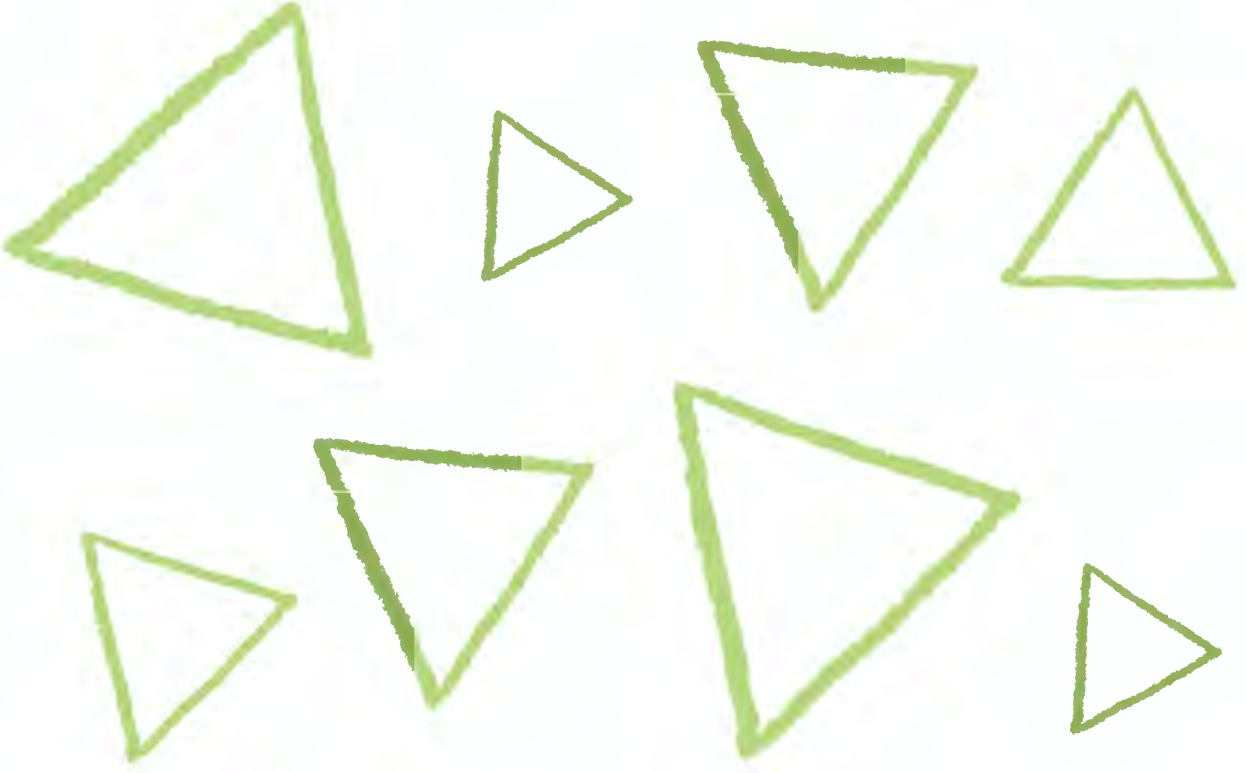
Teacher's Note: Need to do activity with real objects to demonstrate rolling and sliding. Encourage children to tell what objects have they seen rolling and sliding.

Shapes

1. Join the same shapes.



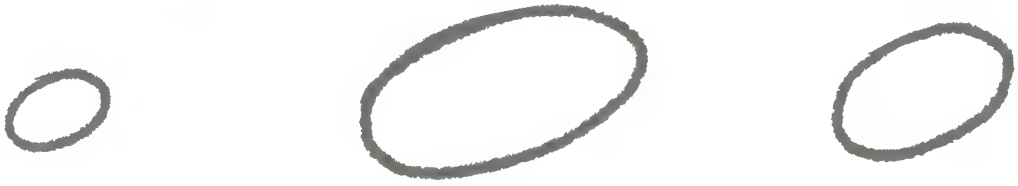
2. Match the same sizes



3. Colour the smallest shape

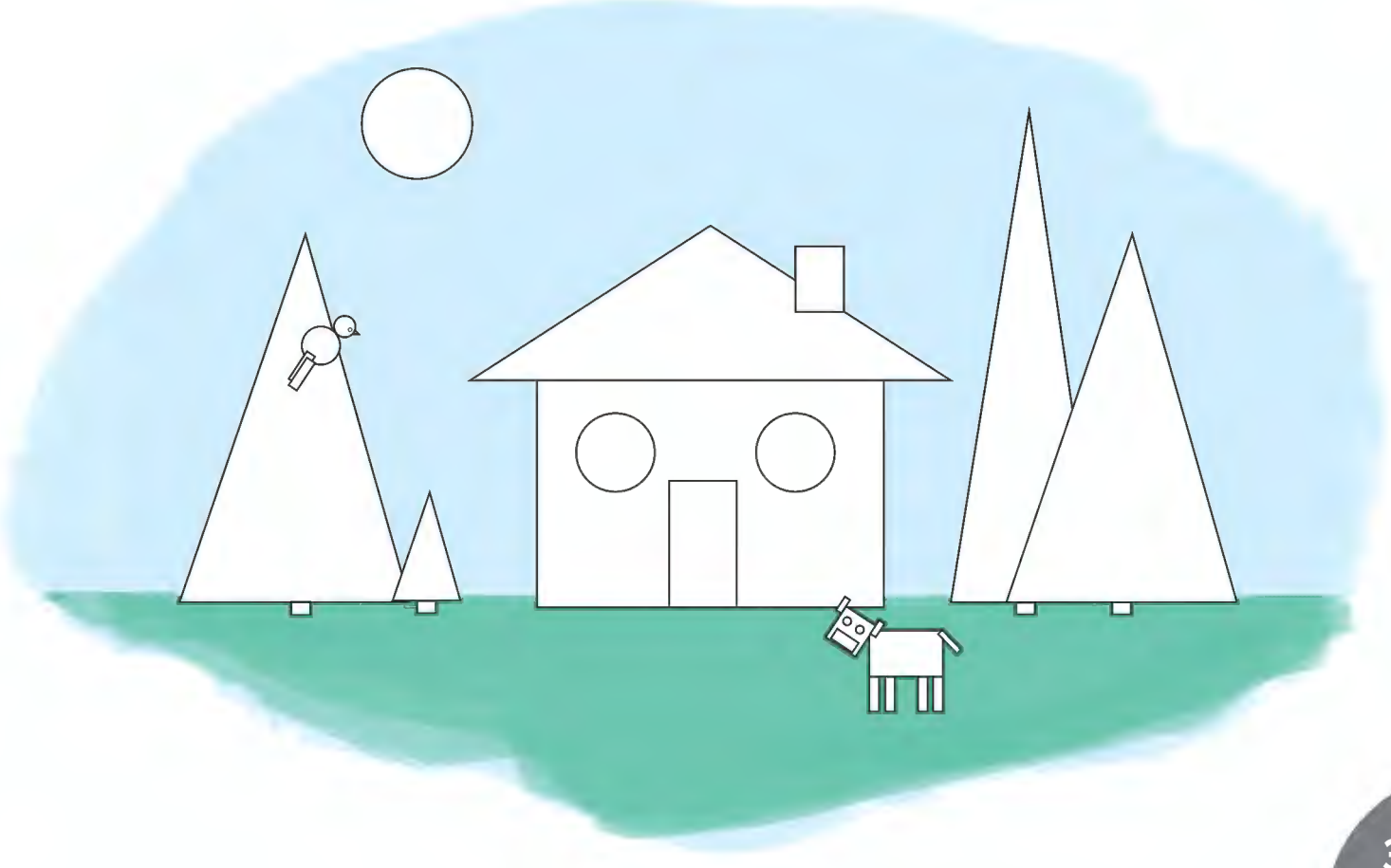
a.

b.



c.

4. Colour green red yellow

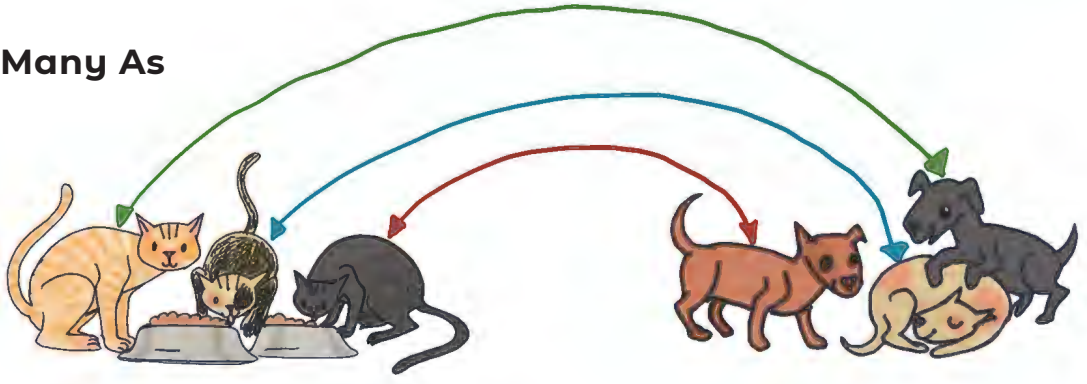


2. Meeting Numbers

N7N4E1

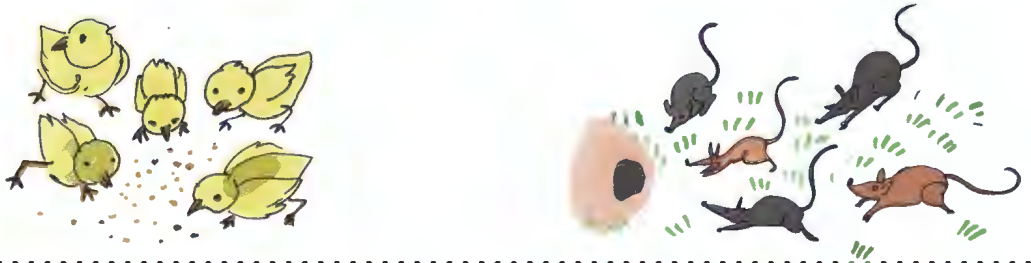
As Many As

1.



2.

3.

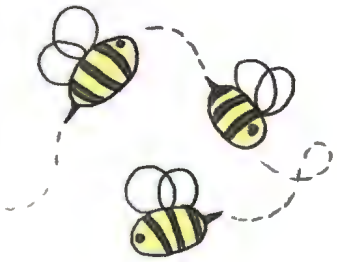


4.

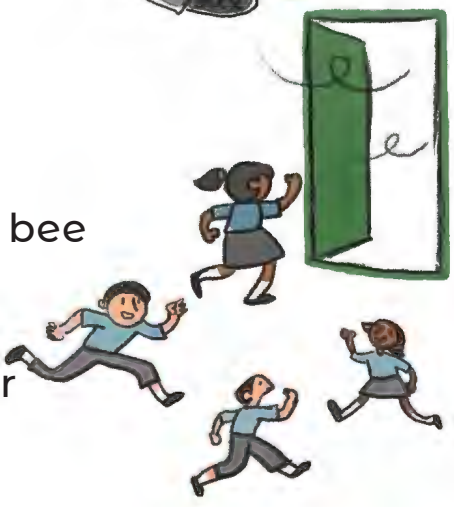
5.

Counting

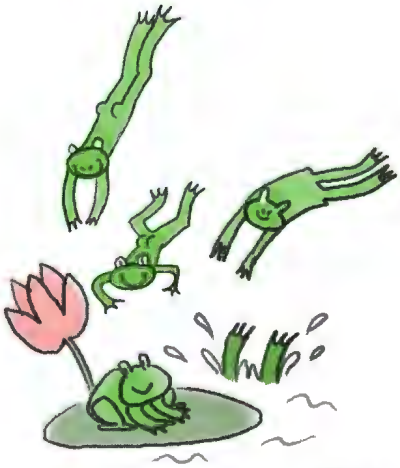
One one one, I am a rising sun



Two two two, polish a shoe

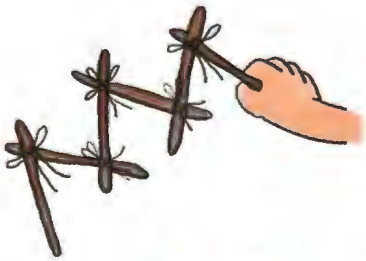


Three three three, I am a busy bee



Four four four, shut the door

Five five five, little frogs dive



Six six six, lets fix the sticks

Seven seven seven, look at the heaven

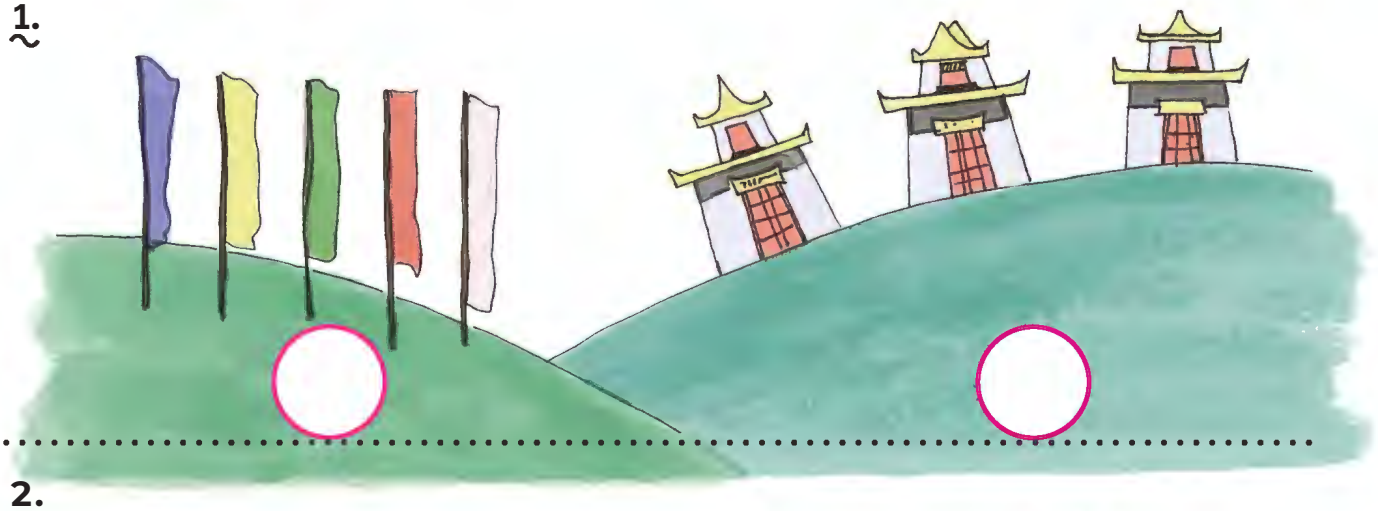
Eight eight eight, I finished my plate

Nine nine nine, we stand in a line

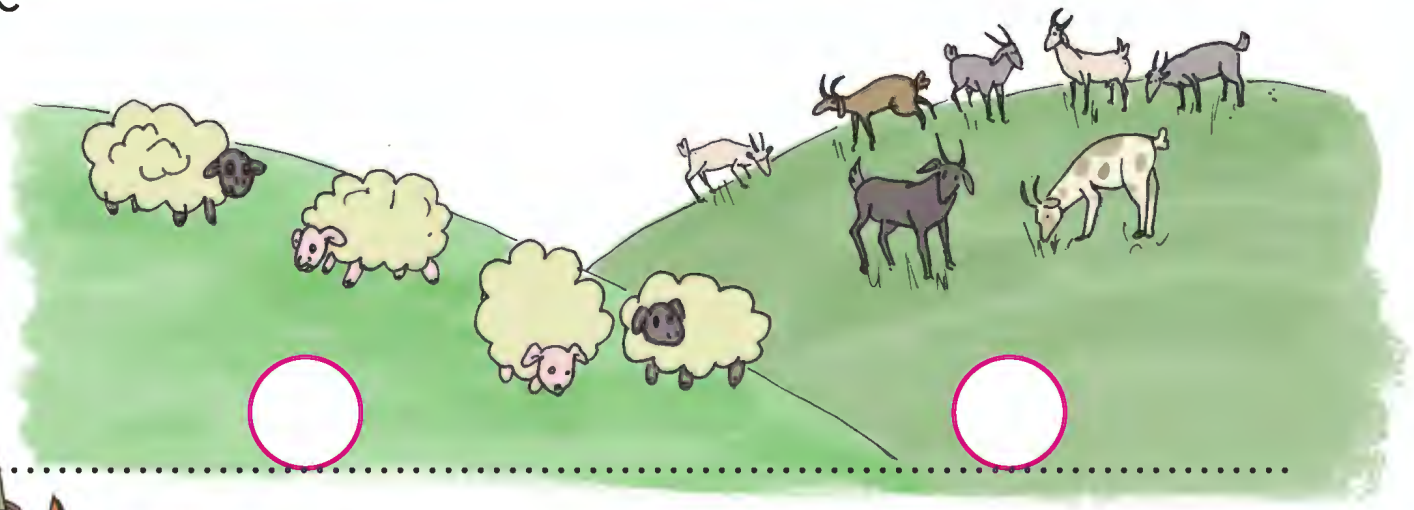
Ten ten ten, we start again ...

Give a 🙂 to the picture with more objects

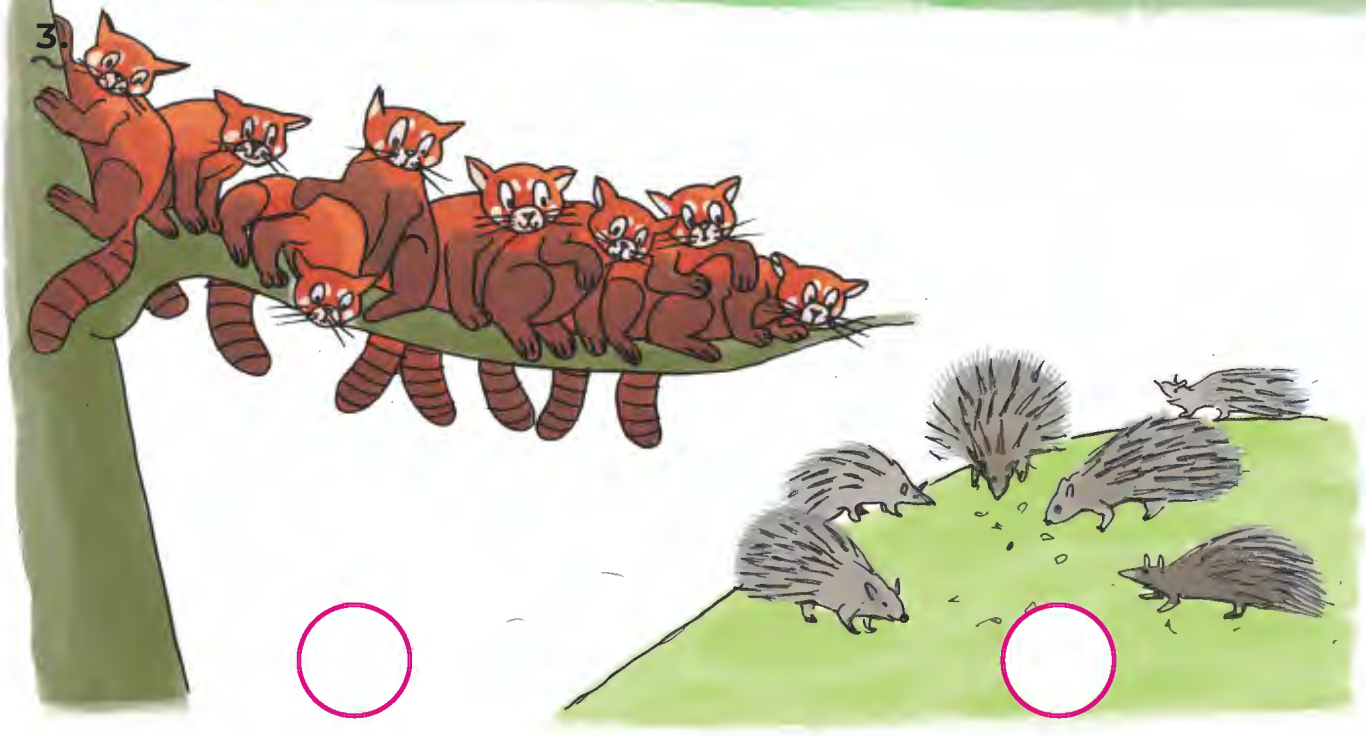
1.



2.



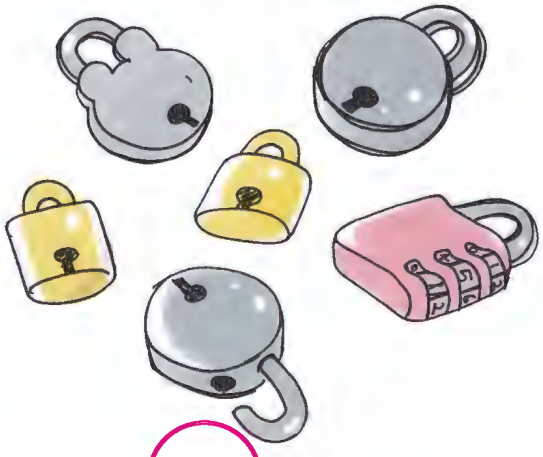
3.

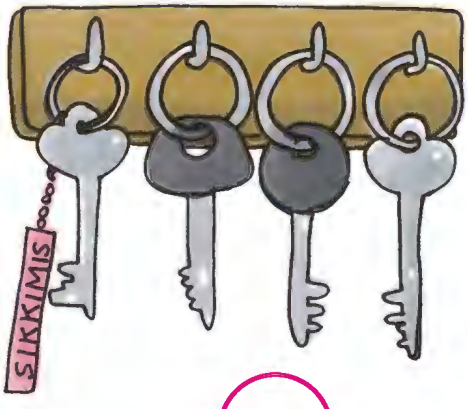


Give a 🙂 to the picture with less objects

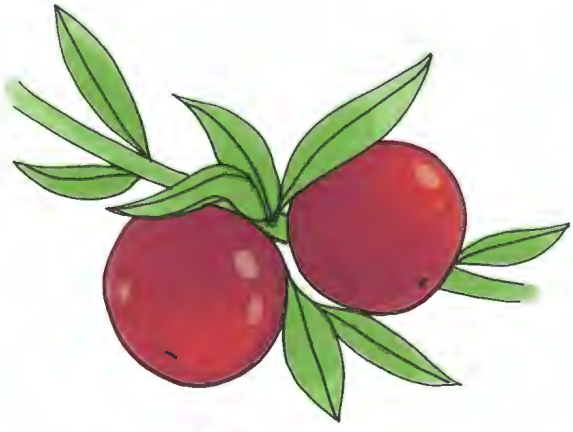
1.

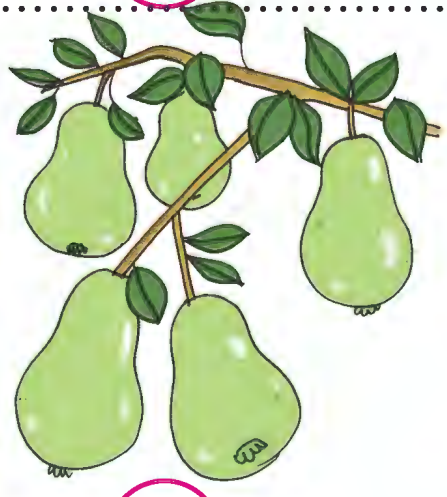
2.





3.





Count and match

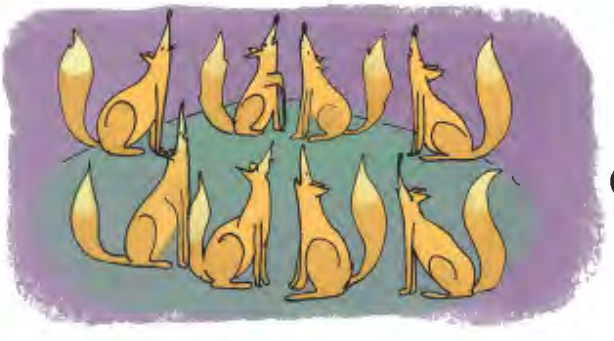
1.

2.

3.

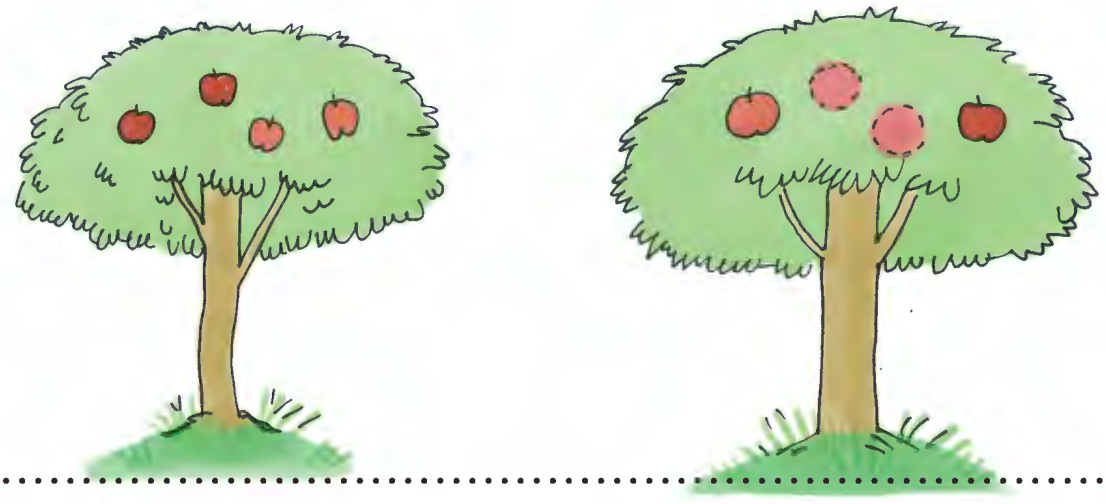
4.

5.

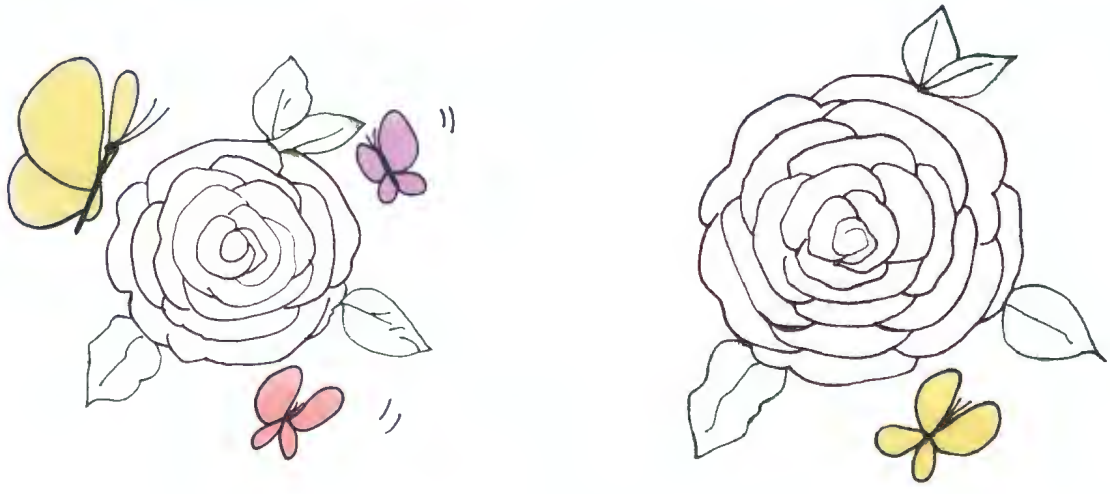


Draw the objects to make the collections equal

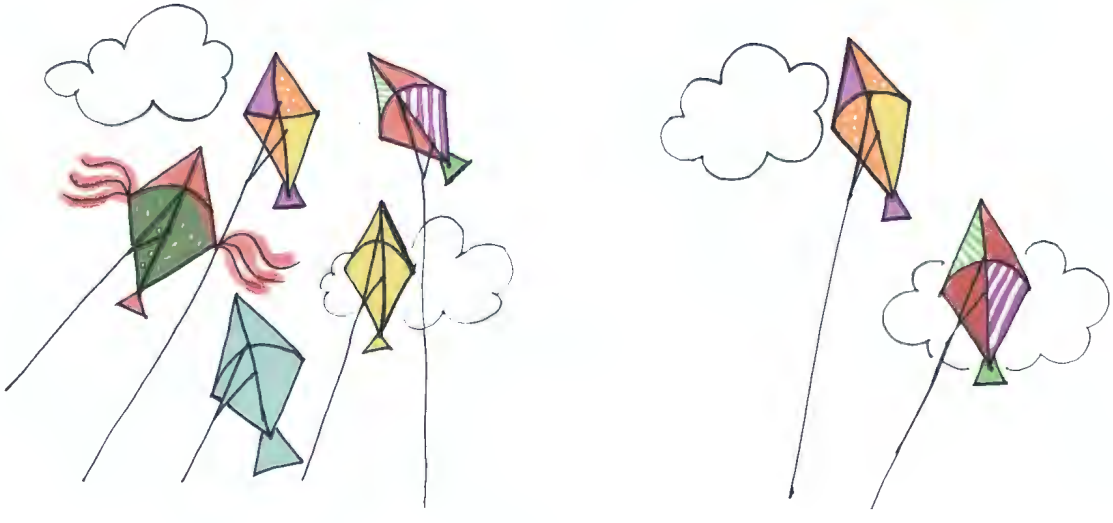
1.



2.

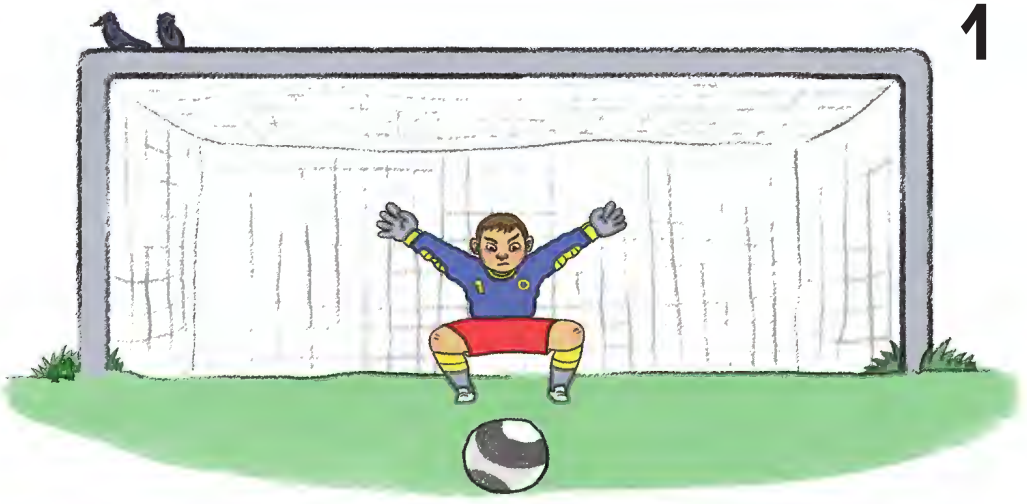


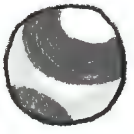
3.



One

1



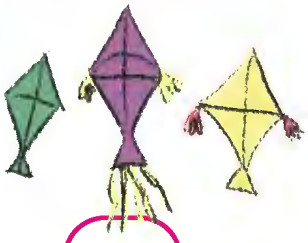


Two

2

Three

3



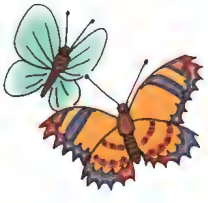
Four

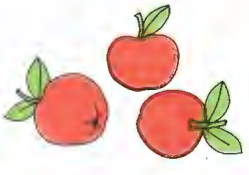
4

Five

5

Count and match





4

1

5

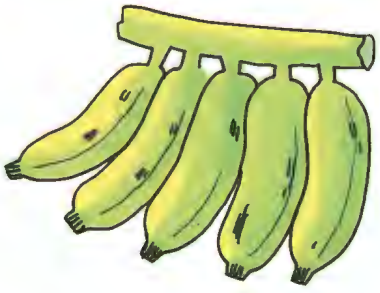
2

3

Make a group of

1. 1 calf

2. 3 bananas



3. 5 cars

4. 4 people

5. 2 fishes

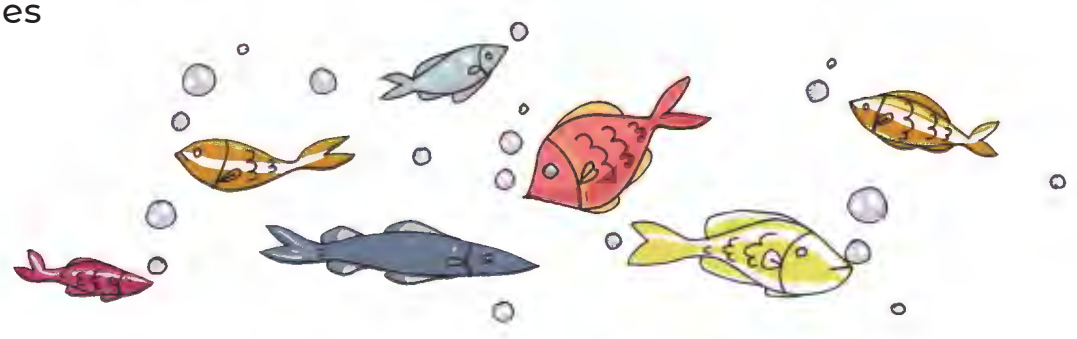
Circle

1. 4 balloons

2. 3 flowers

3. 2 balls

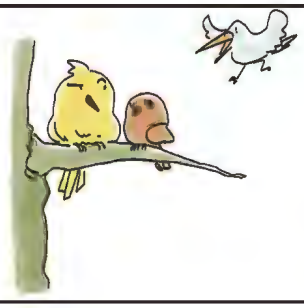
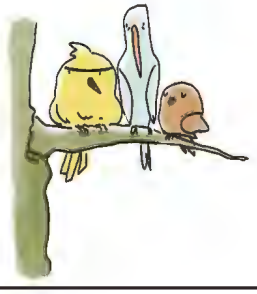
4. 5 fishes



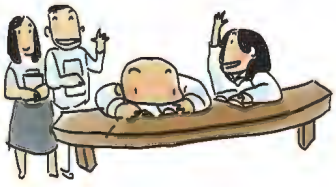
Playing with numbers

Fill in the blanks

1.

		
2 birds	and 1 more bird	total 3 birds

2.

		
_____ children	2 more children	total 4 children

3.

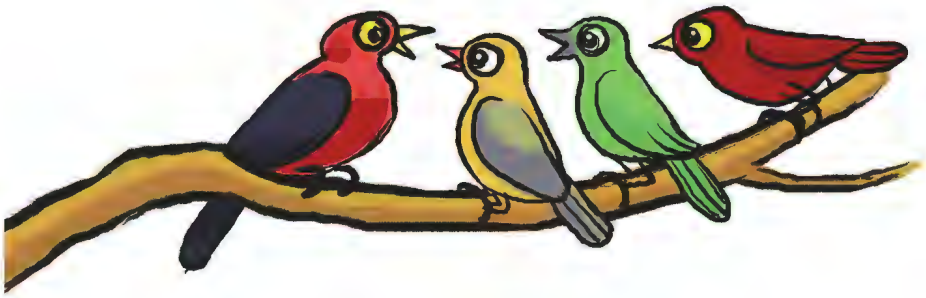
1 diya	_____ more diyas	total _____ diyas

4.

_____ pots	1 more pot	total _____ pots

Zero

4 little birds sitting on a tree



One flew away,

How many are left?

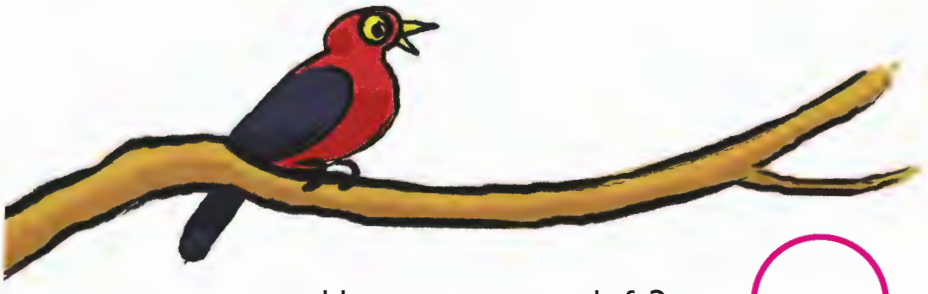
3 little birds sitting on a tree

One flew away,

How many are left?

2 little birds sitting on a tree

One flew away,



How many are left?

1 little bird sitting on a tree

One flew away,

How many are left?

Activity

1. Can you make your fingers sleep like this?

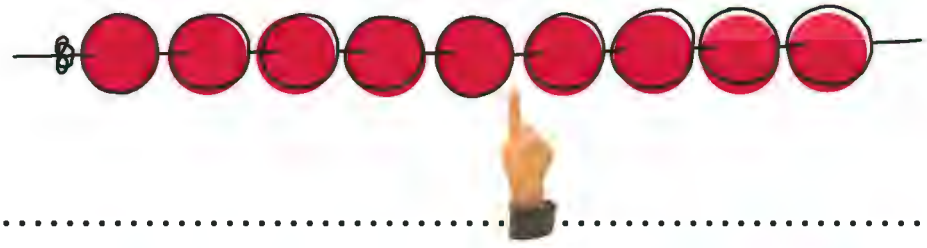
2. Now can you wake up 3 fingers?

3. Can you do it in another way?

4. Fill up the table
   How many are awake?

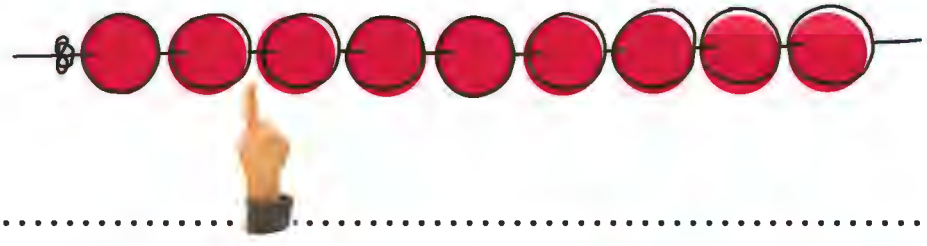
How many standing?	2			
How many sleeping?	3			

How many beads?

1. 
5

2.

3.

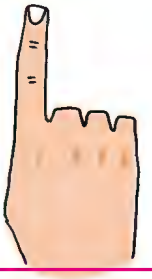
4. 

5.

6.

Playing with numbers

1.

			
3	2	1	0

2.

3.

4.

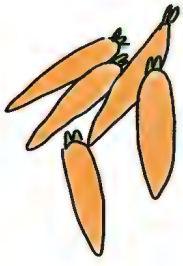
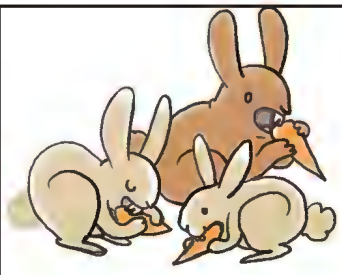
3	2	1	

Fill in the blanks

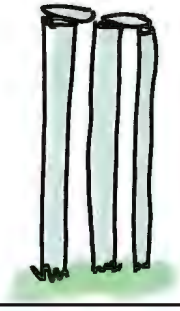
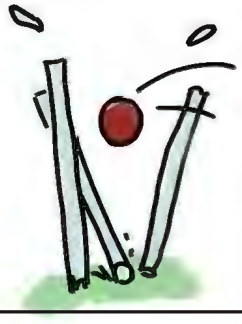
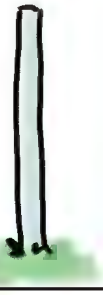
1.

4 children	1 out	3 children left

2.

		
_____carrots	3 carrots eaten	_____carrots left

3.

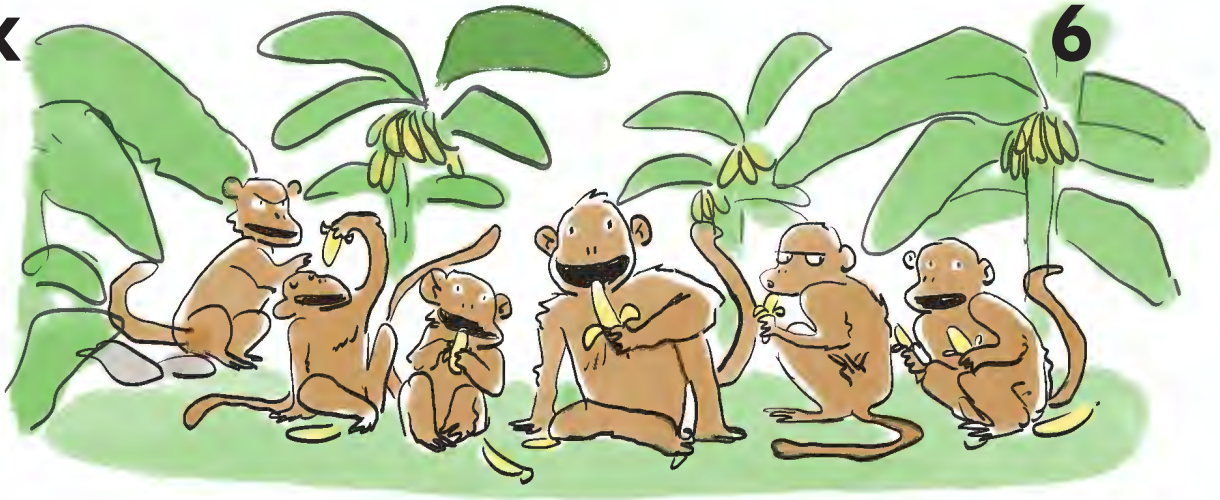
		
_____ stumps	_____stumps fallen	_____stump standing

4.

_____ eggs	2 eggs hatching	_____ eggs left

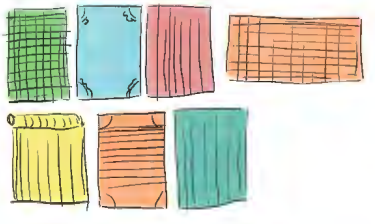
Six

6



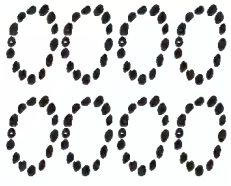
Seven

7



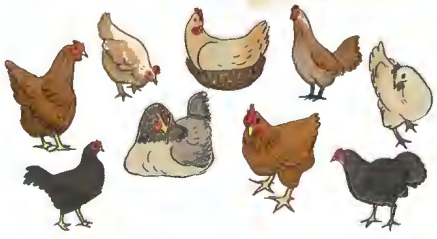
Eight

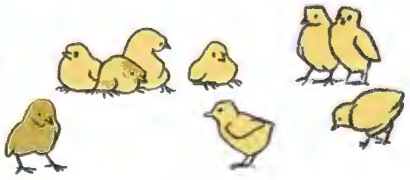
8



Nine

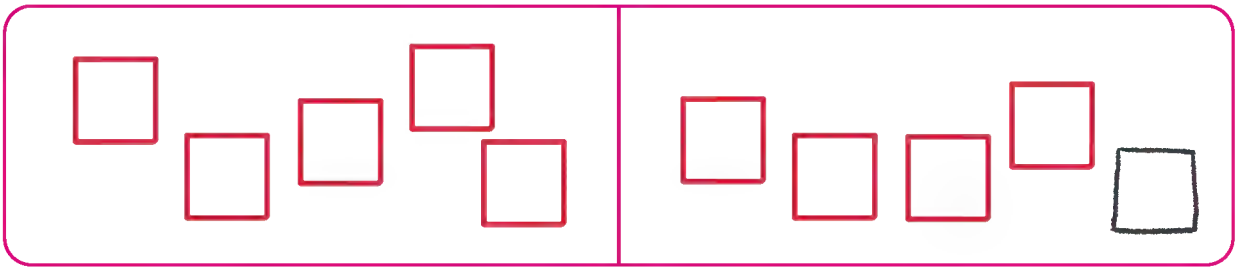
9



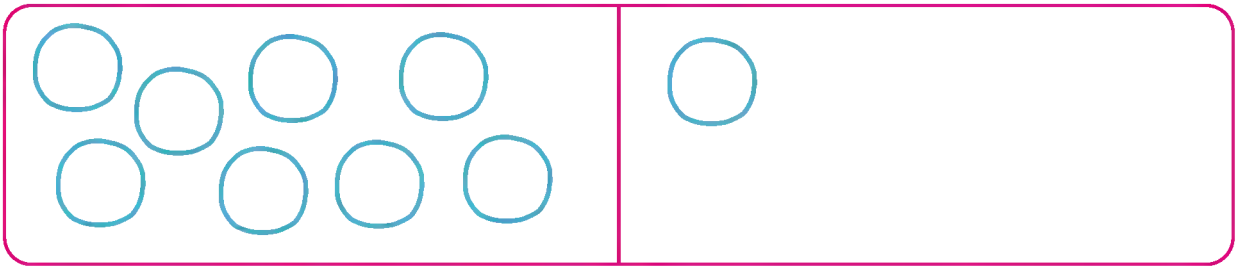


Make the collections equal

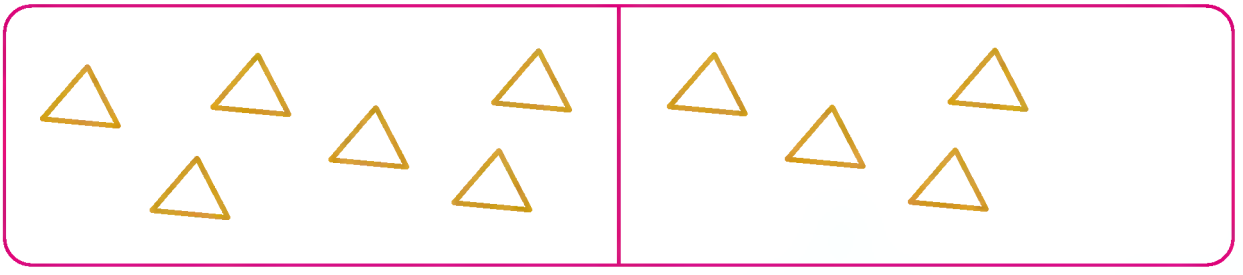
1.



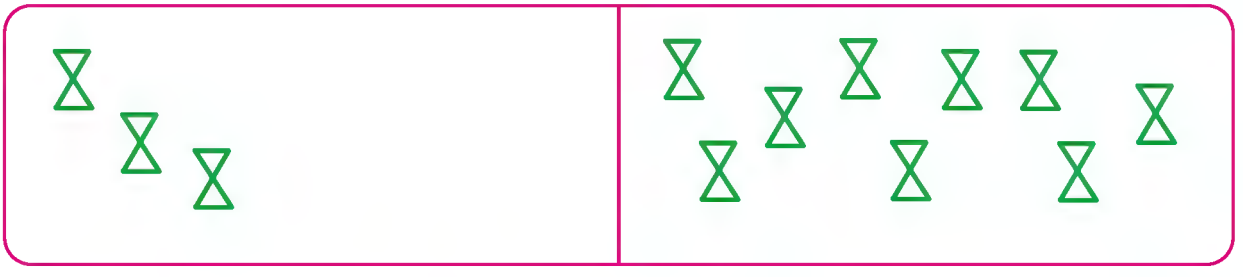
2.



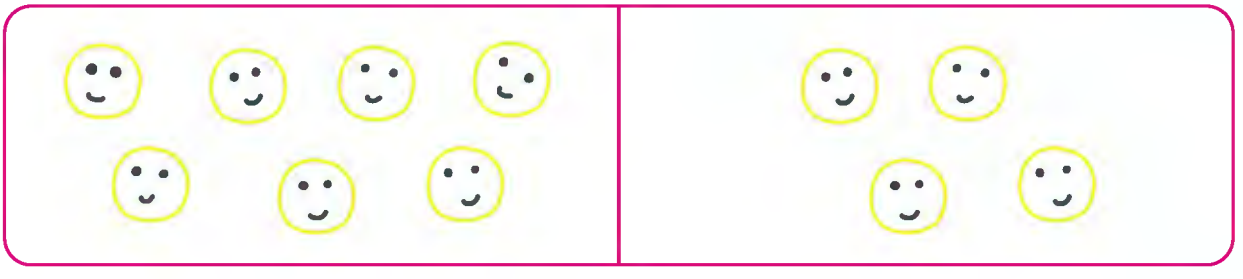
3.



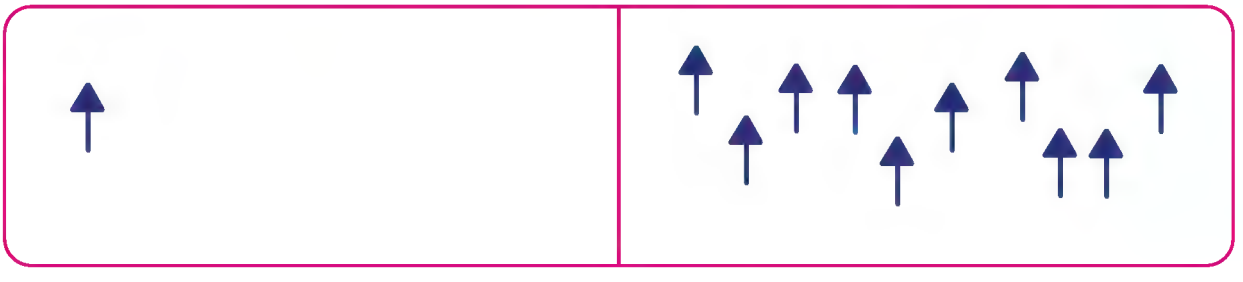
4.



5.



6.



Activity

1. Let us play with fingers again. Let us start with both hands this time.

2. Now can you wake up 6 fingers?

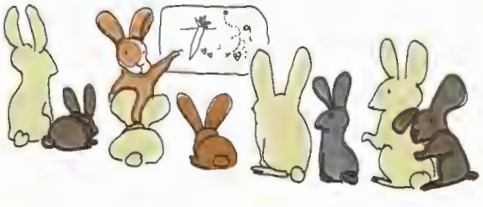
3. Can you do it in another way?

4. Fill up the table

	How many are standing?	How many are sleeping?
	4	6

Join in order from 0 to 9 and colour it

Count and match:



9

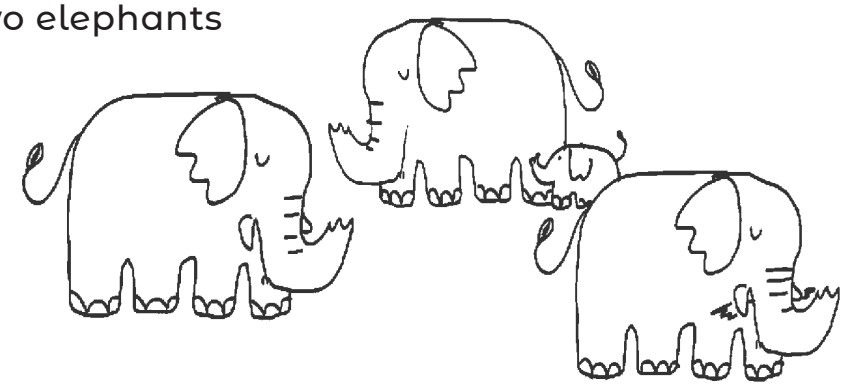
6

7

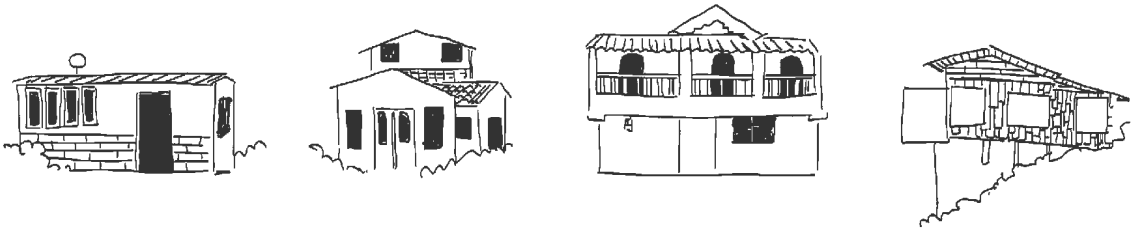
5

8

1. Colour two elephants

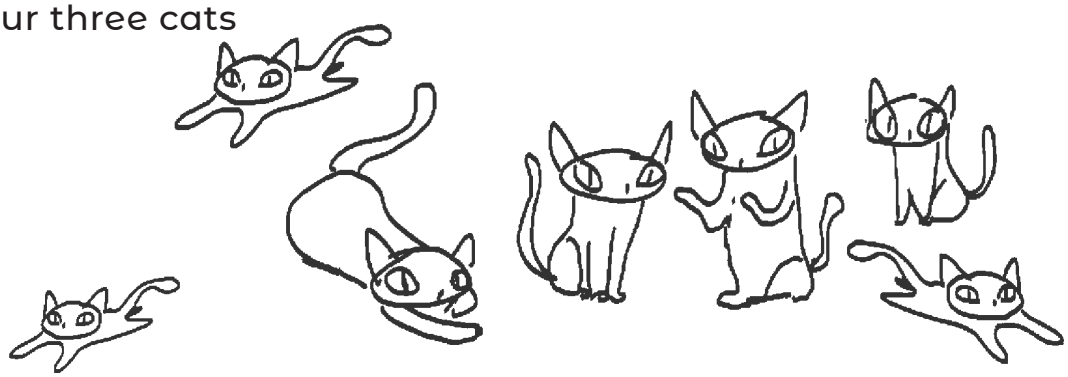


2. Colour one house

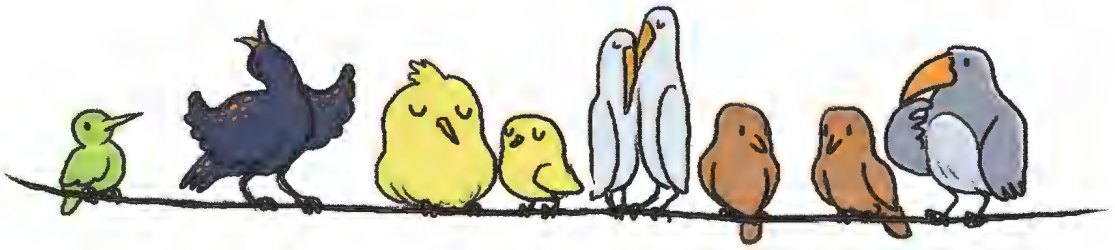


3. Colour six flowers

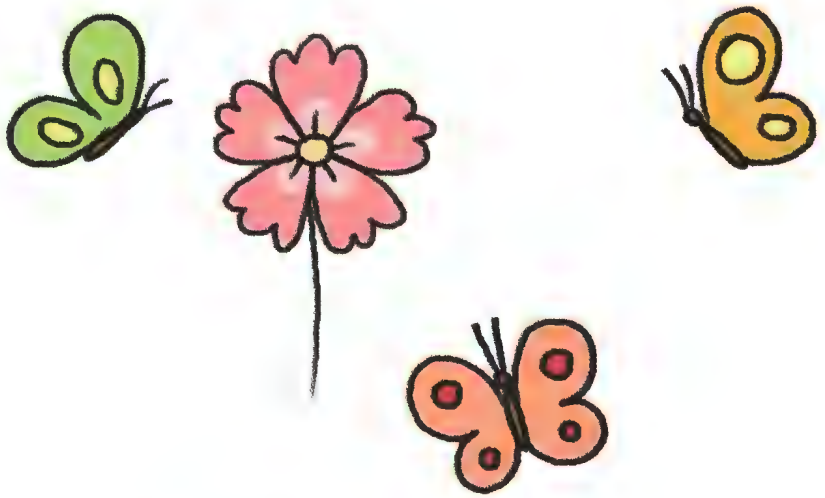
4. Colour three cats



5. Circle seven birds



6. Circle 2 butterflies



7. Draw 3 more balloons to make 7

Circle the correct number

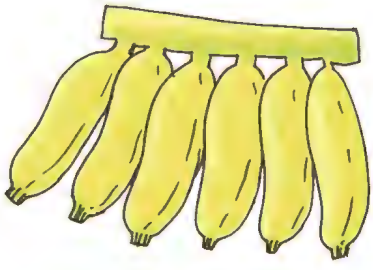
1.

4 2 3

2.

6 3 5

3.



7 4 6

4.

8 7 4

5.

9 5 8

3. Combining and Removing

V1A4V9

Addition

Dorji, Rohan, Samten, Diki, Abhishek and Nalasa wanted to play pittu. But there was a problem. They divided into 2 teams and both teams wanted Abhishek.

Can you guess why?

He is our best hitter.

Team One

Abhishek Samten Diki

Team Two

Dorji Rohan Nalasa

Teacher's Note: Find out from children if someone knows the rules of the game. If they do not know then explain the rules of the game.

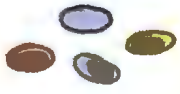
4 on the stack, 3 on the ground.

___on the stack, ___on the ground.

___on the stack, ___on the ground.

1.

3 stones

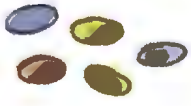


4 stones

3 stones and 4 stones

2.

___ stones



___ stones

___stones and ___stones

3.

___ stones

___ stones

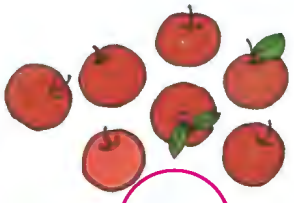
___ stones and 1 stone

Teacher's Note: Initiate a conversation with the children by changing the numbers which remain on the stack. The conversation should be on addition subtly asking 3 are on stack how much has to be put back to give 7. This total can be changed to any number up to 10.

Addition

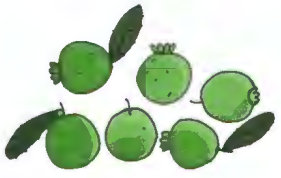
1. Combine and tell:

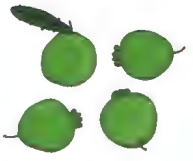
a.



7 and 2 is equal to 9

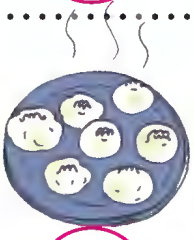
b.

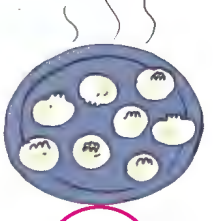




and is equal to

c.



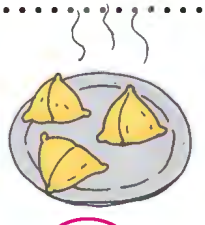


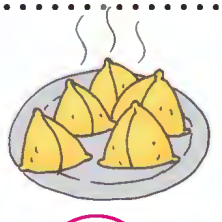
and =

d.

\+ =

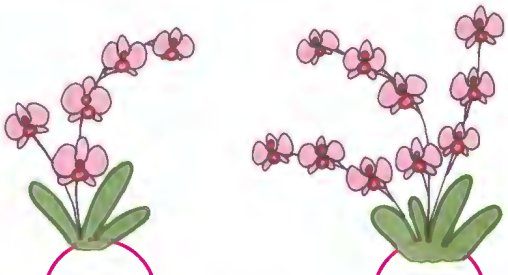
e.





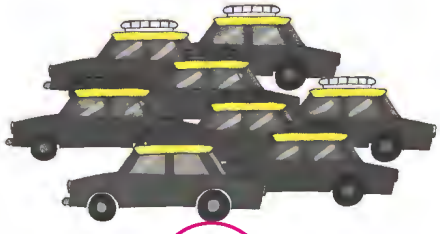
\+ =

f.



( ) + ( ) = ( )

g.



( ) + ( ) = ( )

h.

( ) + ( ) = ( )

i.

( ) + ( ) = ( )

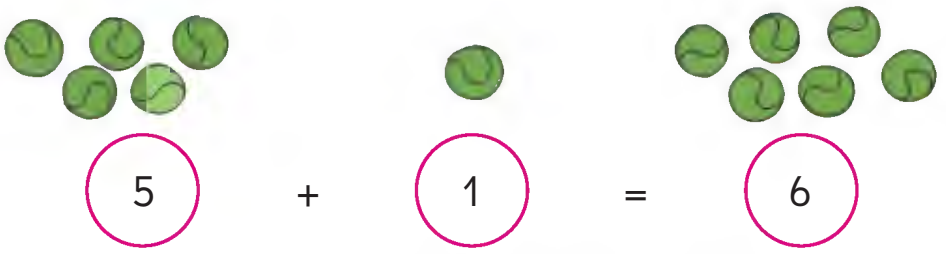
j.

( ) + ( ) = ( )

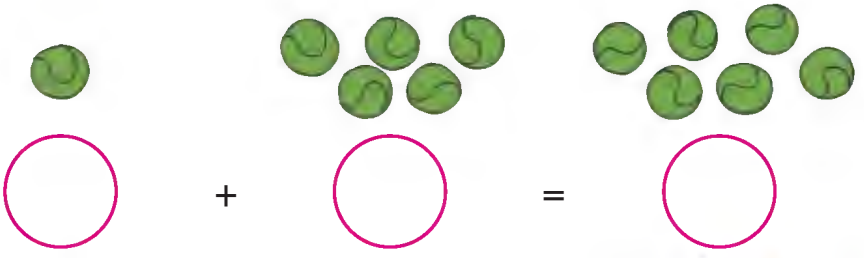
Teacher's Note: Question 'j' is open ended. Child can fill in any number and show the fact.

2. Let us complete as shown in the example

a.

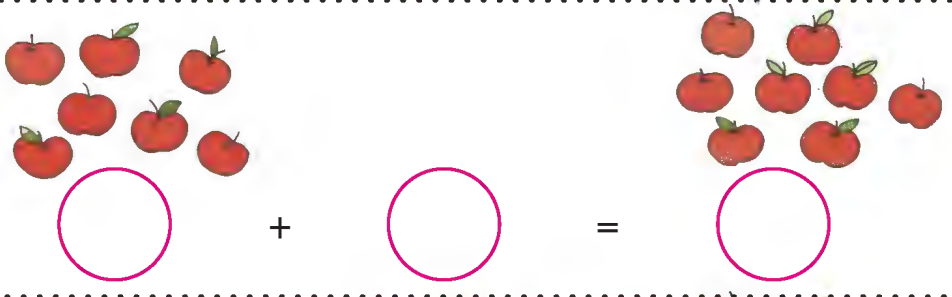


5 + 1 = 6

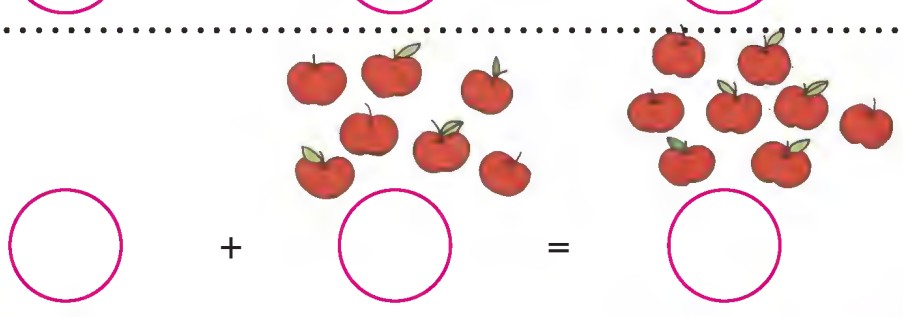


__ + __ = __

b.



__ + __ = __



__ + __ = __

c.

__ + __ = __

__ + __ = __

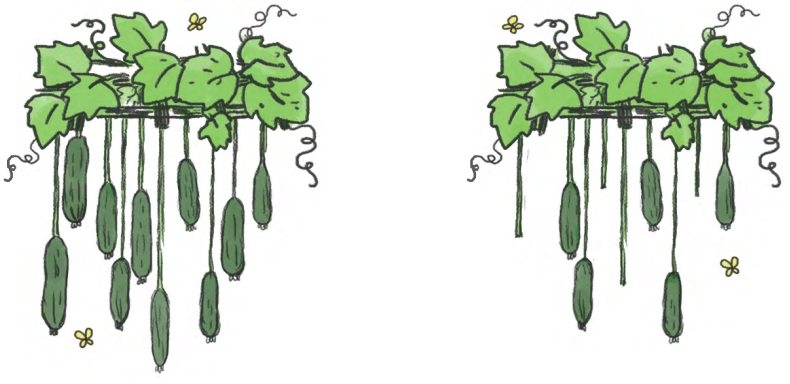
Neeraj's Kitchen Garden

Neeraj found 9 tomatoes on the tomato plant. To make chutney for momos, his father told him to pluck 3 tomatoes from it.

How many tomatoes were left on the plant?

Neeraj's father always tells him to pluck vegetables only when they are needed. They share some vegetables with the neighbours also.

1. There were 10 cucumbers on the plant and 5 were plucked. So, how many remained on the plant?

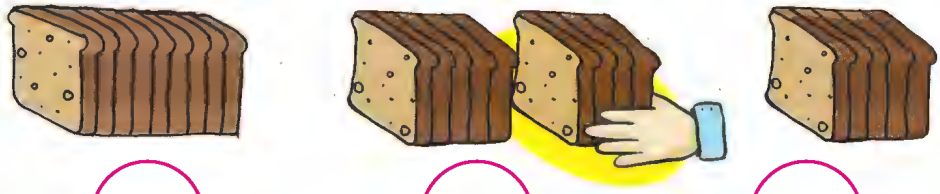


2. There were 6 tomatoes and Neeraj picked 2 tomatoes. So, how many remained on the plant?

Subtraction

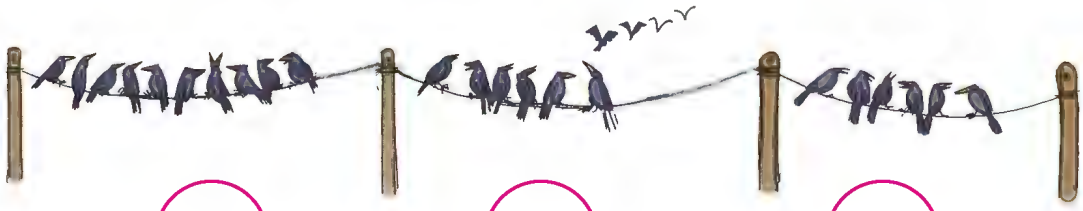
1. Let us do the following:

a.



9 take away 4 remaining 5

b.



( ) crows ( ) flew away ( ) remaining

c.

( ) – ( ) = ( )

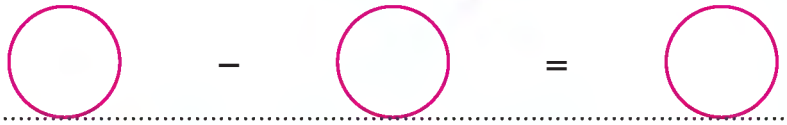
d.

( ) – ( ) = ( )

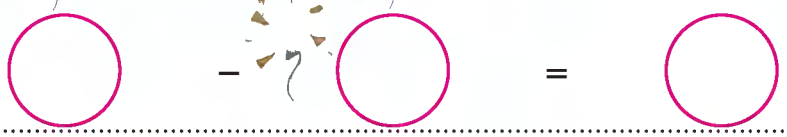
e.

( ) – ( ) = ( )

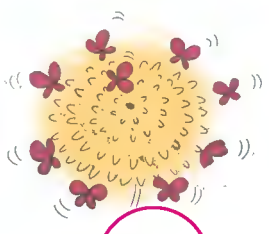
f.

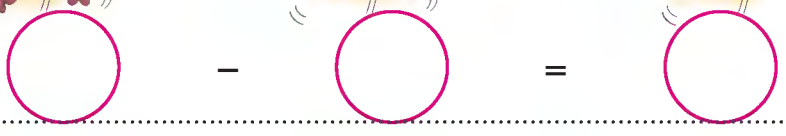


g.

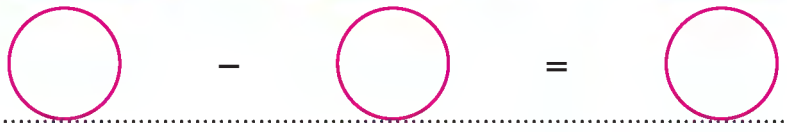


h.



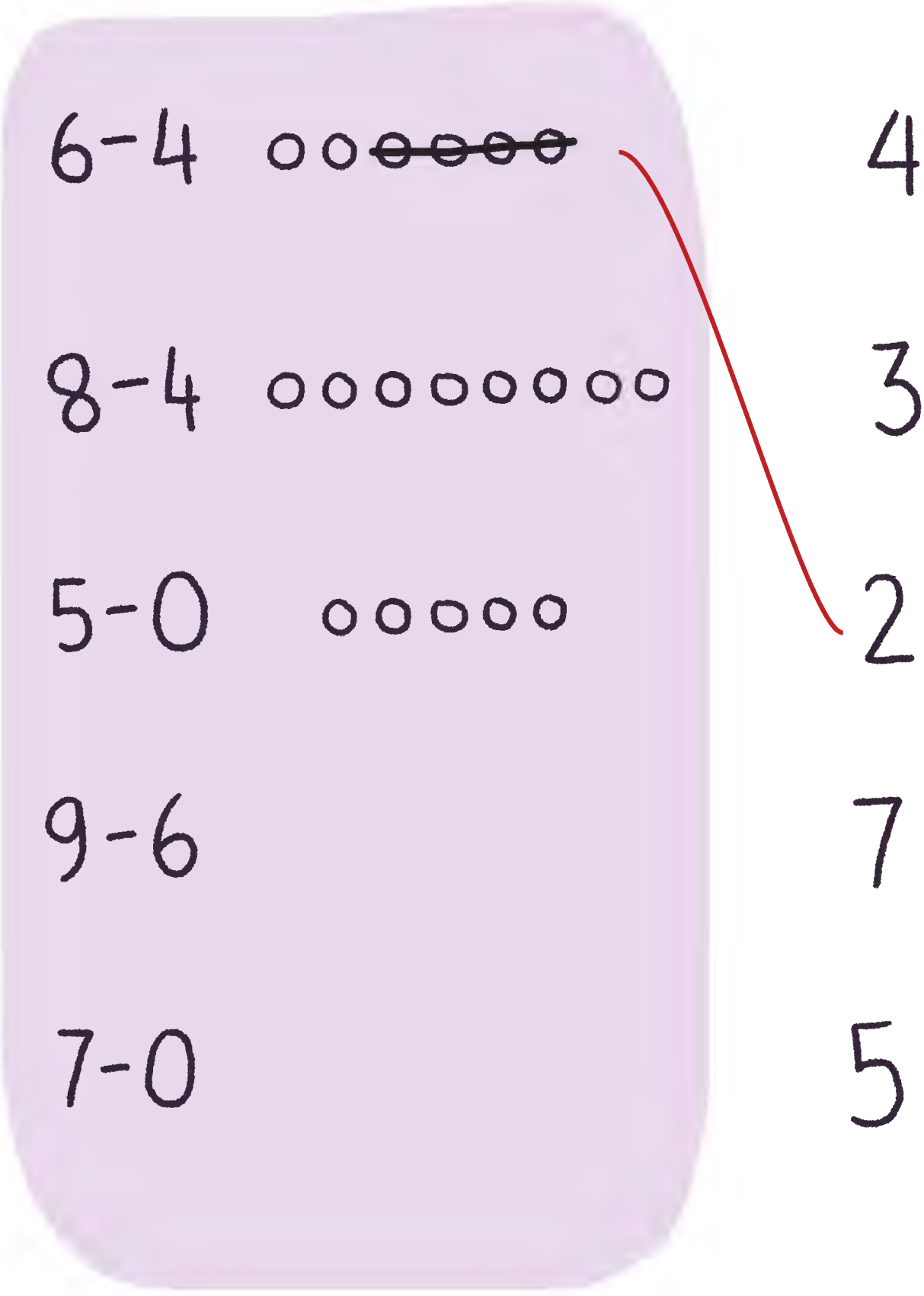


i.



j.

Complete and match as shown



4. Meeting More Numbers

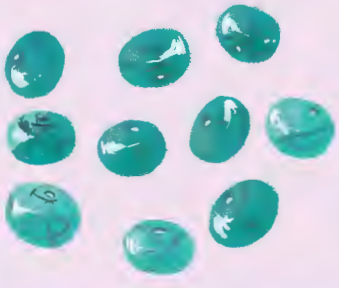
N9R6S7

Numbers from 10 to 20

a bunch of ten

a pack of ten

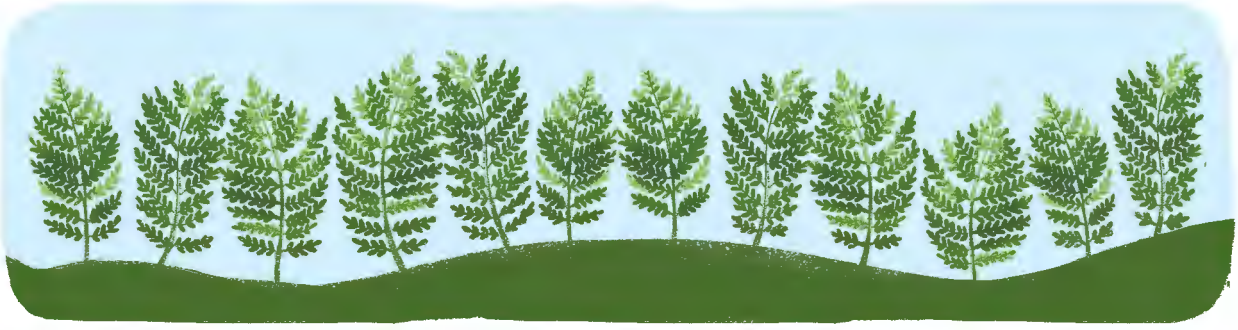
a group of ten



a mala of ten

1. Make a group of ten:

a.

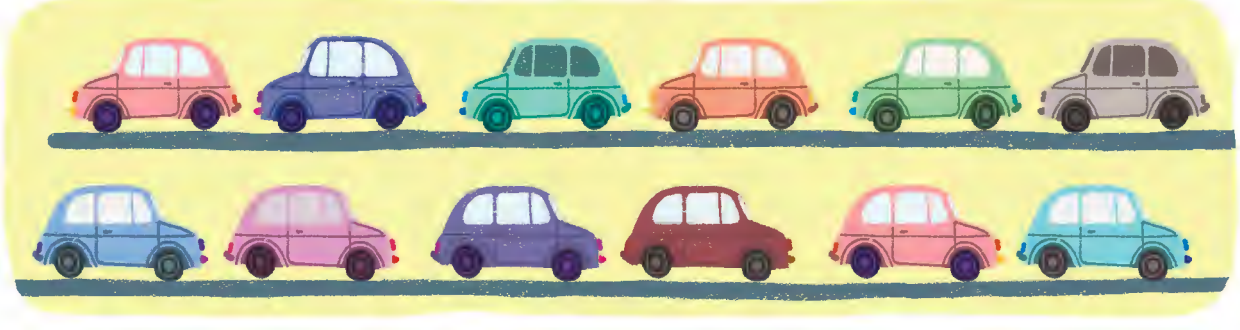


b.

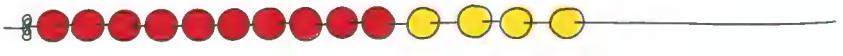
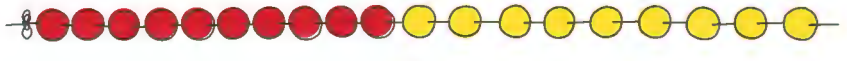
c.

d.

e.



2. Lets us play with mala:

	Tens	Ones	
1 Ten 0 One	1	0	10
1 Ten 1 One	1		11
1 Ten 2 Ones	1		
1 Ten 3 Ones	1		13
 1 Ten 4 Ones	1		
1 Ten 5 Ones	1		
1 Ten 6 Ones	1		
1 Ten 7 Ones	1		17
1 Ten 8 Ones	1		
 1 Ten 9 Ones	1	9	
2 Tens 0 One	2	0	

Eleven 11

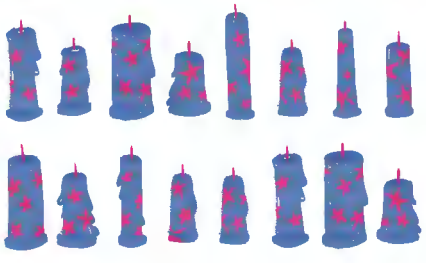
Make a group of **11**

Twelve 12

Circle **12** bananas

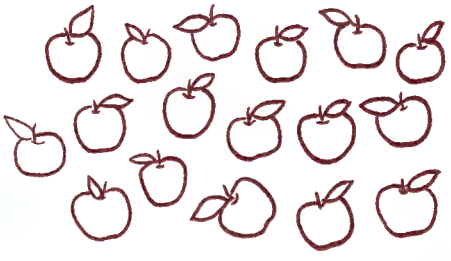
Thirteen 13

Light **13** candles



Fourteen 14

Colour **14** apples



ten **10**

1 Ten 0 One

eleven **11**

1 Ten 1 Ones

twelve **12**

1 Ten 2 Ones

thirteen **13**

1 Ten 3 Ones

fourteen

14

1 Ten

4 Ones

fifteen

15

1 Ten

5 Ones

sixteen

16

1 Ten

6 Ones

seventeen

17

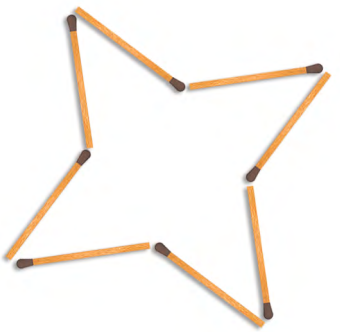
1 Ten

7 Ones

eighteen

18

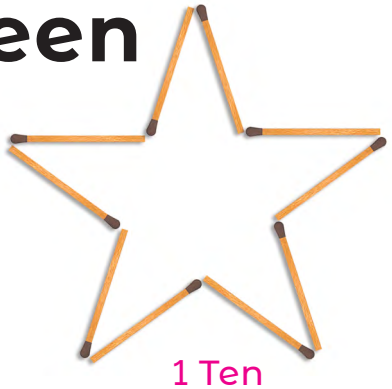
1 Ten



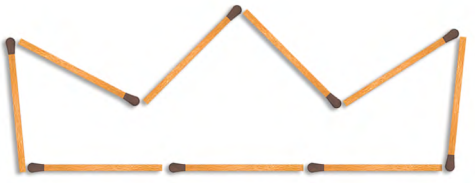
8 Ones

nineteen

19



1 Ten



9 Ones

twenty

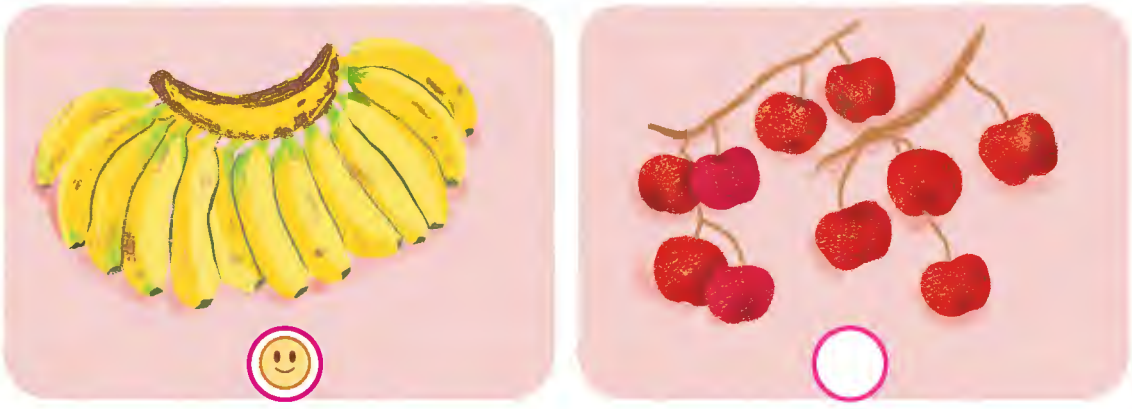
20

2 Tens

0 One

3. Give a ☺ to the group with greater number of things.

a.



b.

c.

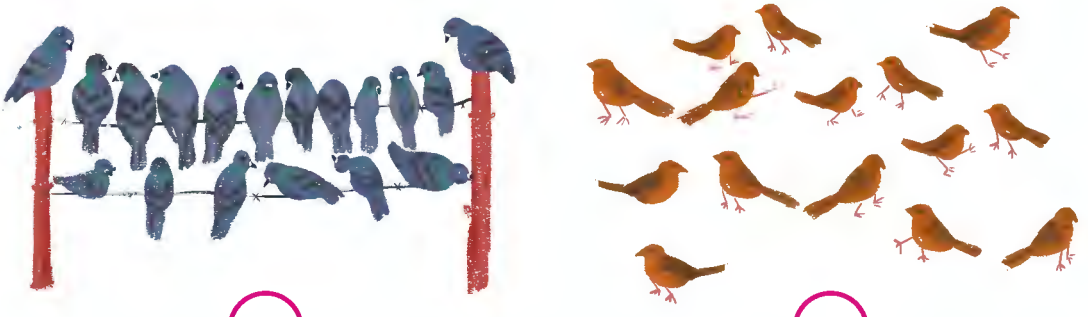
d.

4. Give a 🙂 to the group with less number of things.

a.

b.

c.



d.

5. Raju and his father went to the Maghey Mela

Papa, I am feeling hungry.

let us go to have momos

a. What comes after 12? ☐

b. What comes after 17? ☐

c. What comes before 15? ☐

d. What comes before 20? ☐

e. Write the number before and after 11. ☐ 11 ☐

f. Write the number before and after 19 ☐ 19 ☐

g. What comes between 13 and 15? 13 ☐ 15

h. What comes between 16 and 19? 16 ☐ ☐ 19

6. Give a 🙂 to the bigger number

a. 12 15 ○ ○

b. 11 14 ○ ○

c. 17 13 ○ ○

d. 16 18 ○ ○

7. Give a 🙂 to the smaller number

a. 19 10 ○ ○

b. 13 15 ○ ○

c. 20 17 ○ ○

d. 14 18 ○ ○

8. Underline the biggest number

a. 13 11 16

b. 12 17 10

c. 18 14 16

d. 19 11 16

9. Circle the smallest number

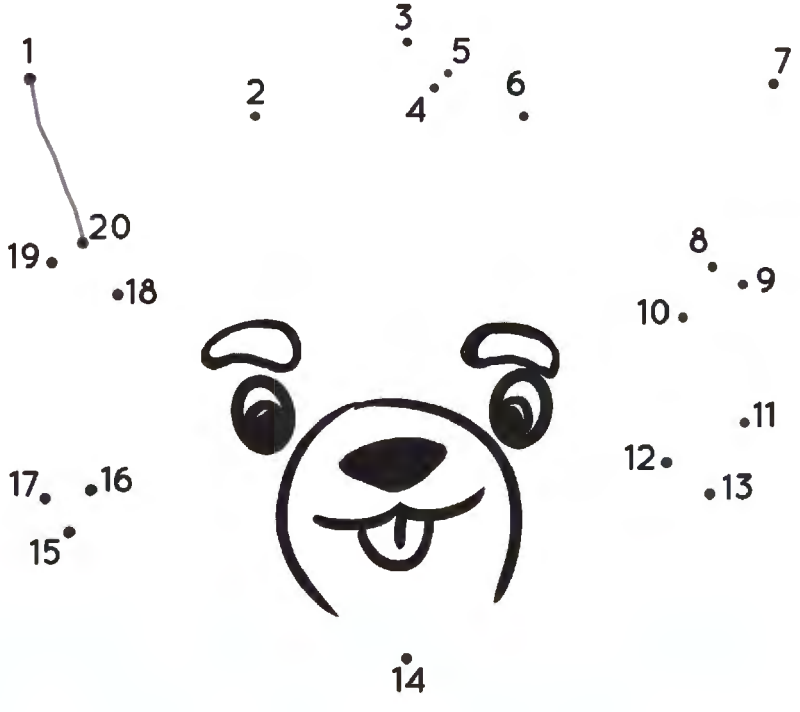
a. 13 10 15

b. 14 13 12

c. 13 12 17

d. 18 19 11

10. Join in order



5. When

E8M6K8

Shyam's Day and Night

wakes up

brushes teeth

does yoga

eats breakfast

feeds the cows

sweeps the room

goes to school

is at school

has mid-day meal

plays

studies

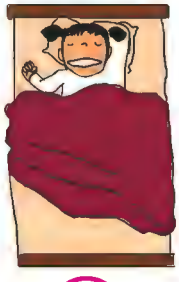
sleeps

1. Tick ✓ what you do in the morning.

2. Tick ✓ what you see during the day.

3. Tick ✓ what you do in the evening.

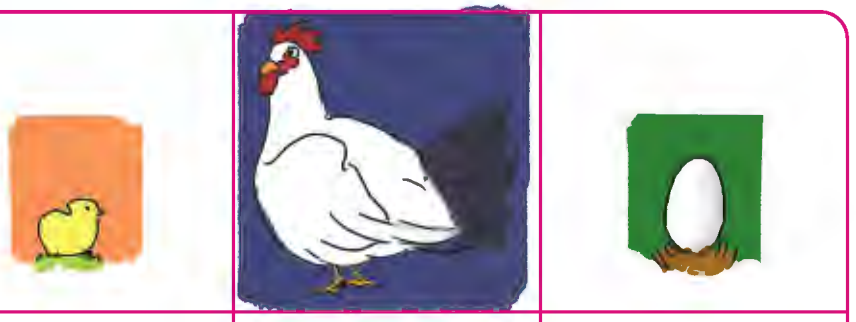
4. Tick ✓ what you do at night.



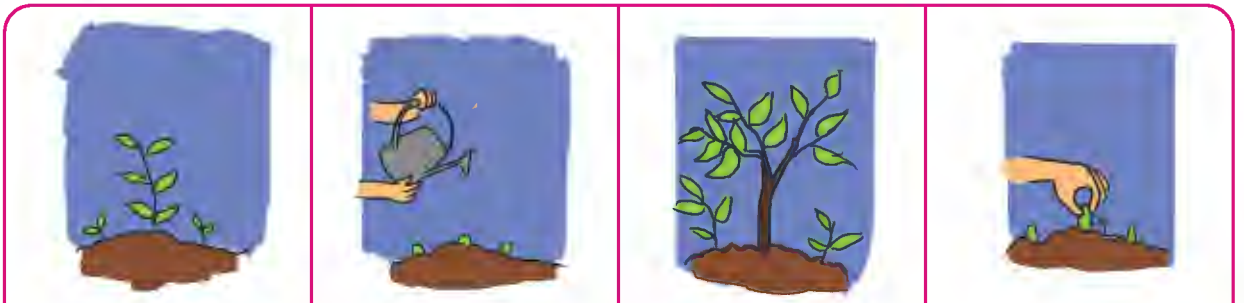
Teacher's Note: There may be more than one activity to tick in the given boxes, e.g. bathing, playing, reading may be in any time.

5. Number the pictures in correct order.

a.



b.



c.

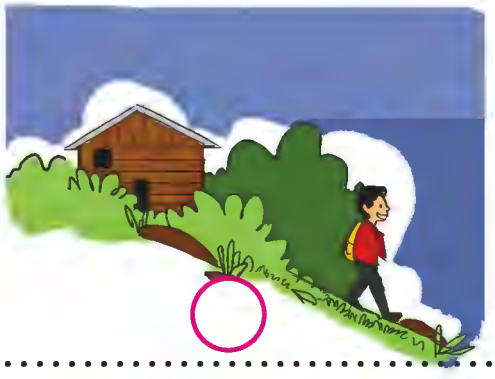
6. Tick ✓ what will take longer.

a.

b.

7. Tick ✓ what will take a shorter time.

a.



b.

6. What Comes Next

U4E8G3

Lepcha Thokro

Nepali
Chaubandi choli

Bhutia
Pangden

Teacher's Note: The teacher should start a conversation with children on what they observe on the clothes and help them find connections in patterns.

1. Let's extend the patterns

a.

b.

c.

d.

e.

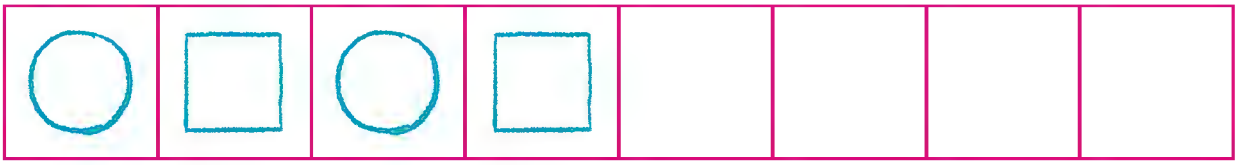
Activity:

The following pattern is made from lady's finger and bitter gourd blocks. Make and extend the vegetable patterns.

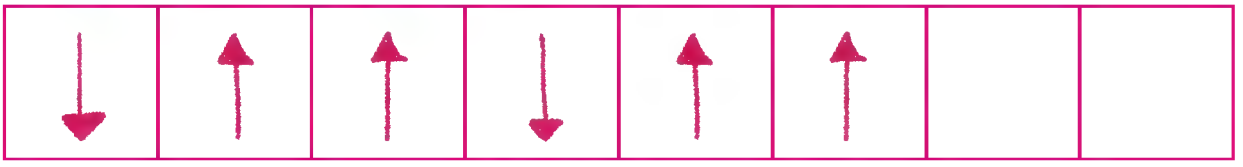
Teacher's Note: Provide different water colours or a stamp pad and cut vegetables (lady's finger, bitter gourd). Ask children to stamp and extend the vegetable patterns. Encourage them to make their own patterns too.

2. Let's draw the missing shapes:

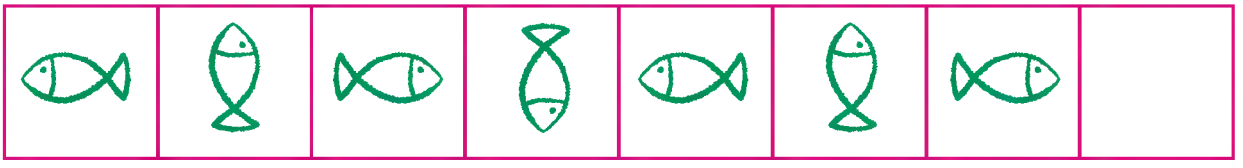
a.



b.

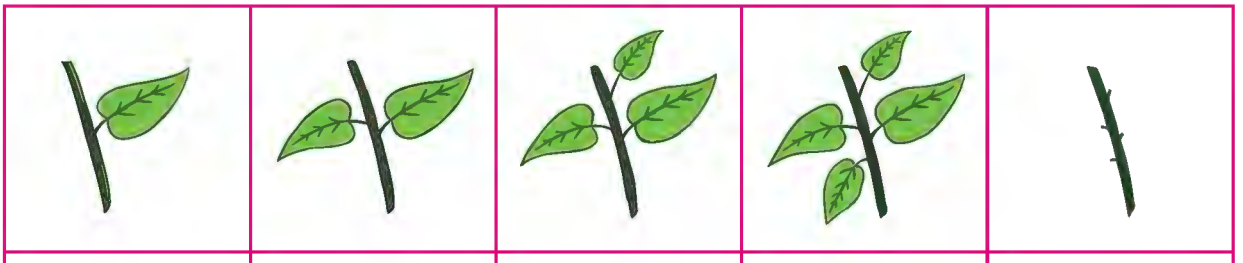


c.



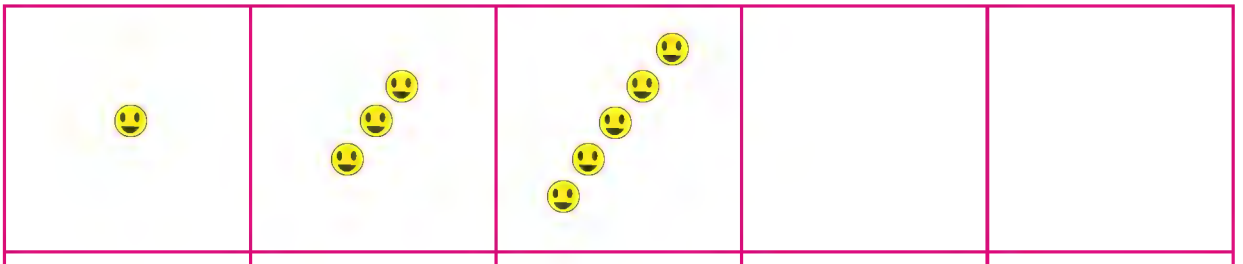
3. Extend the pattern and write the numbers.

a.



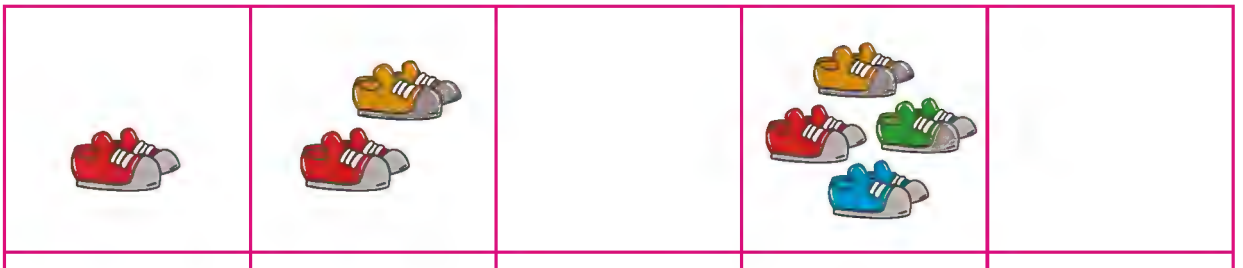
1	2			

b.



1	3	5		9

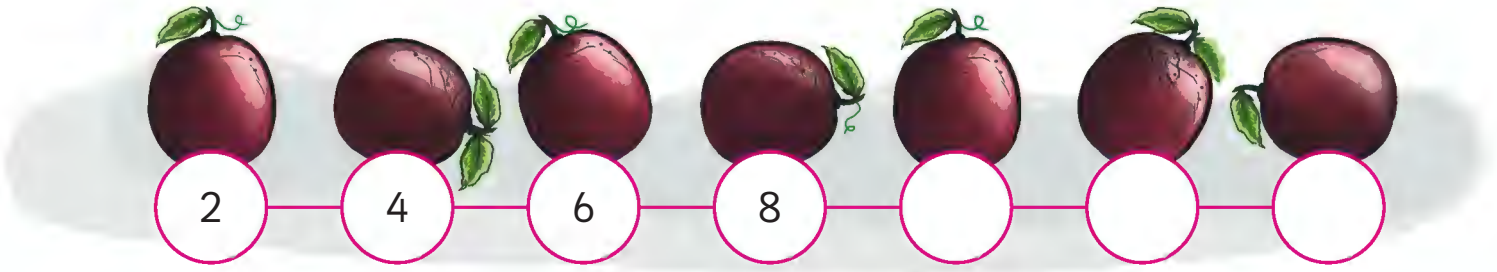
c.



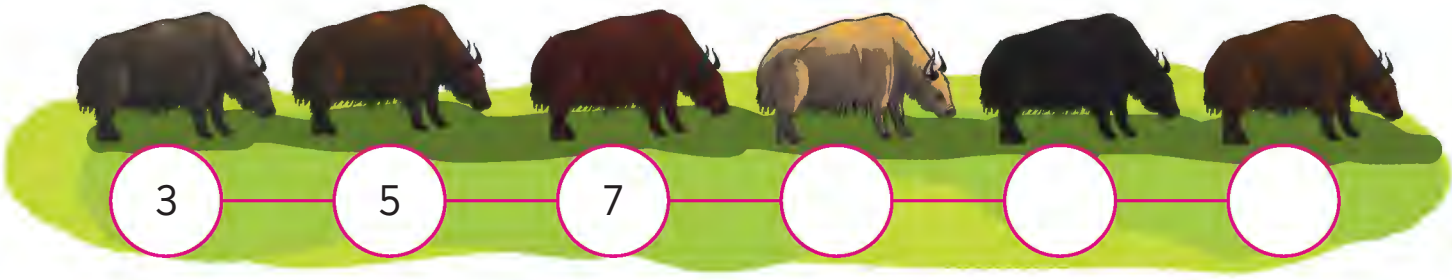
2	4	6		

4. Fill in the missing numbers.

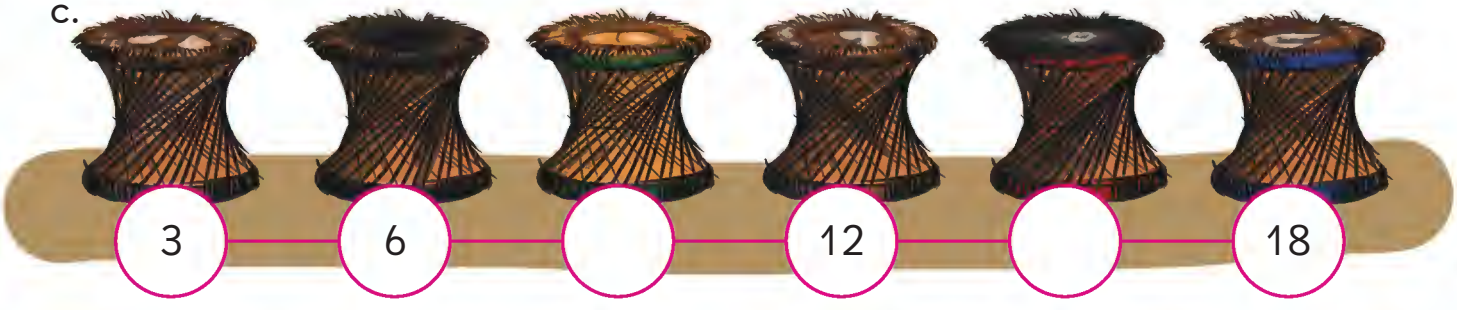
a.



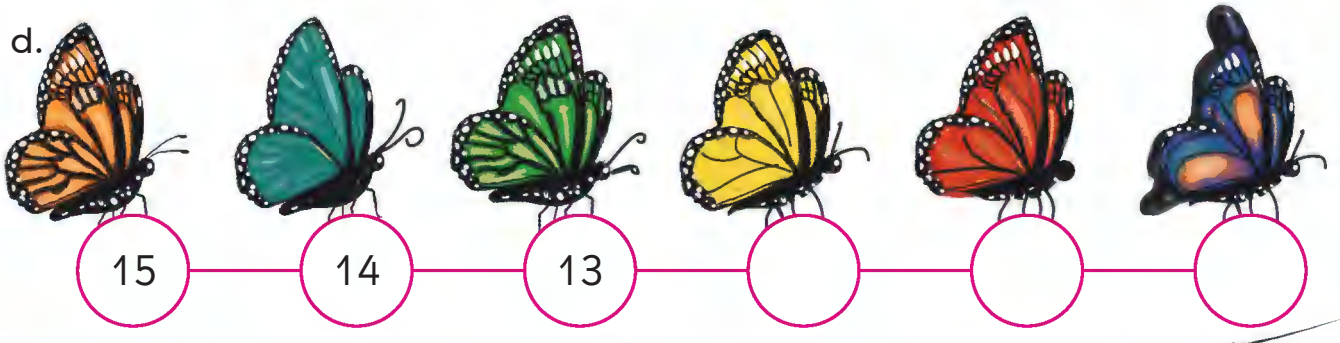
b.



c.



d.



e.

7. Combining and Removing

H8K1W5

1. **Let's count:**

   a. How many fingers are standing?_____

   b. How many are sleeping? _____

   c. How many total? 5 + 5 = _____

2. **Fill the table:**

	How many fingers are standing?	How many fingers are sleeping?	
	◯	◯	4 + 6 = ◯
	◯	◯	◯ + ◯ = ◯
	◯	◯	◯ + ◯ = ◯
	◯	◯	◯ + ◯ = ◯
	◯	◯	◯ + ◯ = ◯

Sliding card activity

This is a sliding card.

It has _____ dots.

How many dots can you see? _____

So how many dots are inside?

10 – _____ = _____

a.

_____ dots are outside

So 10 – ◯ = ◯ dots are inside.

b.

_____ dots are outside

So 10 – ◯ = ◯ dots are inside.

c.

_____ dots are outside

So 10 – ◯ = ◯ dots are inside.

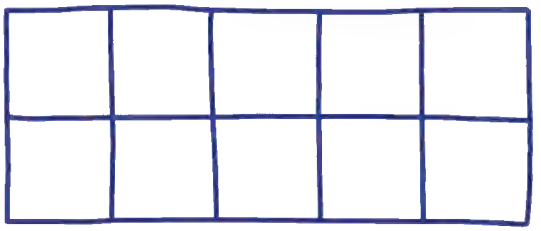
d.

_____ dots are outside

So 10 – ◯ = ◯ dots are inside.

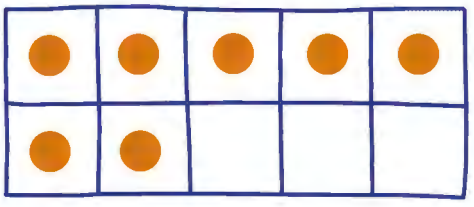
Ten-Frames

This is a ten-frame



How many cells are there? _____

a.

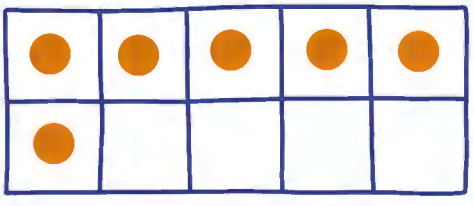


How many dots can you see? 7

How many cells are empty?

10 – 7 = 3

b.

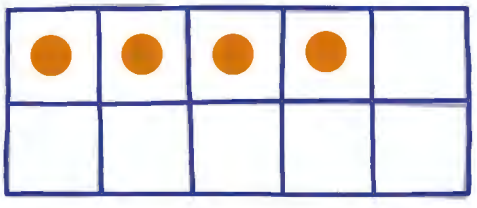


How many dots can you see? _____

How many cells are empty?

10 – ◯ = ◯

c.

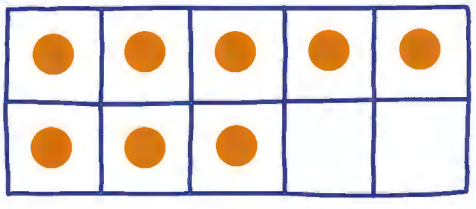


How many dots can you see? _____

How many cells are empty?

10 – ◯ = ◯

d.

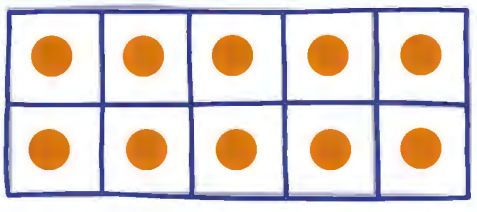


How many dots can you see? _____

How many cells are empty?

10 – ◯ = ◯

e.



How many dots can you see? _____

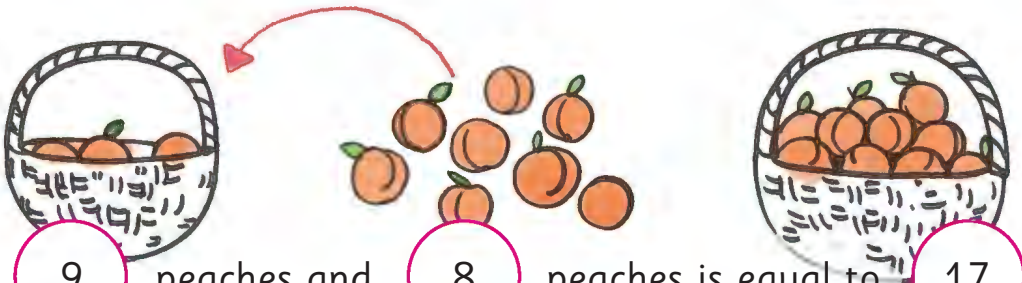
How many cells are empty?

10 – ◯ = ◯

Neeraj's Kitchen Garden

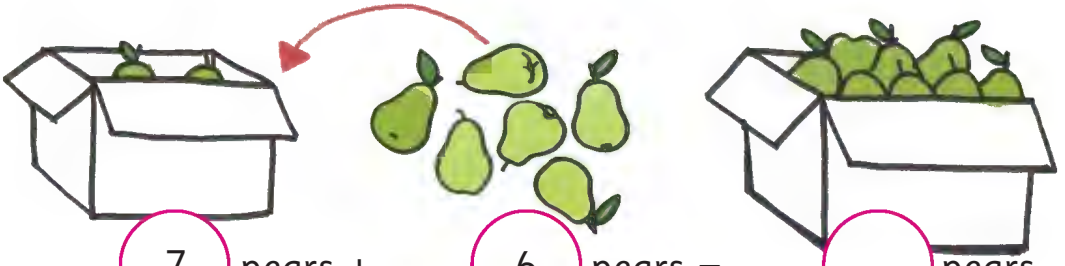
1. Let us help Neeraj now:

a.



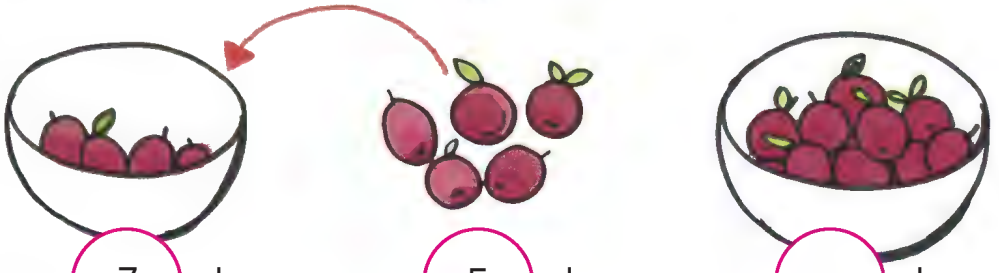
9 peaches and 8 peaches is equal to 17 peaches

b.



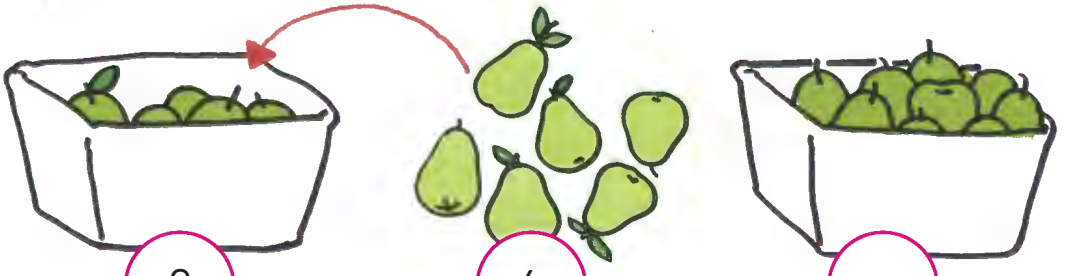
7 pears + 6 pears = ____ pears

c.



7 plums + 5 plums = ____ plums

d.

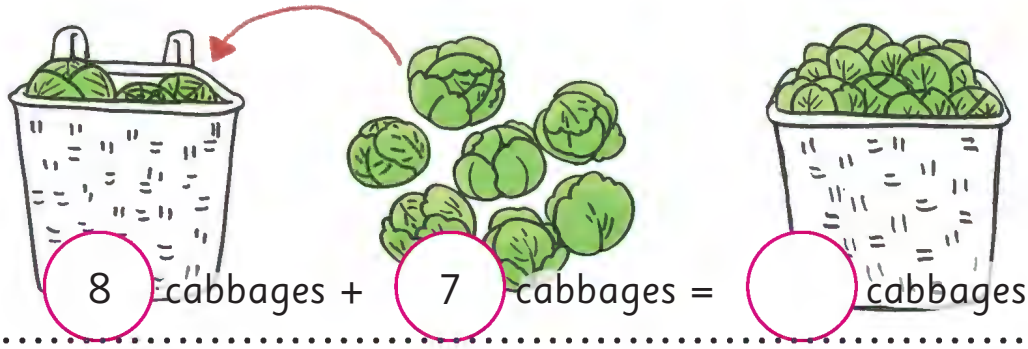


9 pears + 6 pears = ____ pears

e.

7 chillies + 9 chillies = ____ chillies

f.

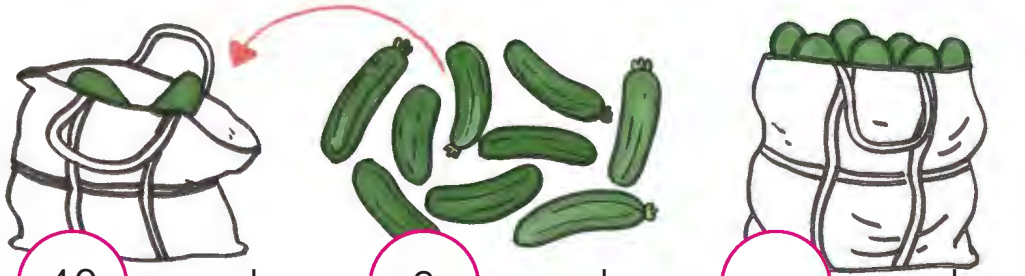


8 cabbages + 7 cabbages = ☐ cabbages

g.

3 tomatoes + 8 tomatoes = ☐ tomatoes

h.

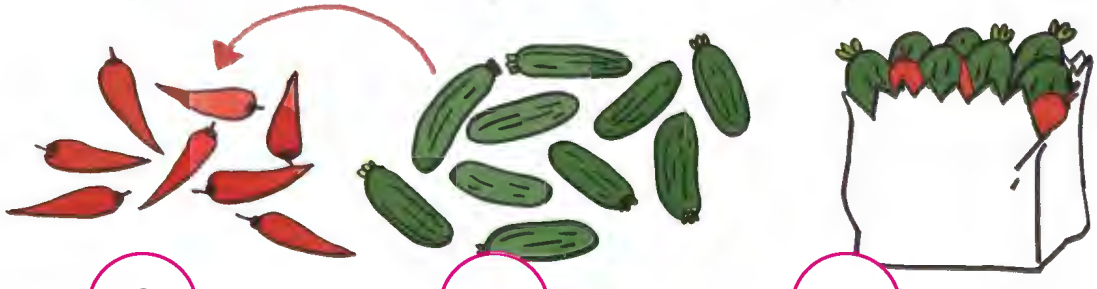


10 cucumbers + 9 cucumbers = ☐ cucumbers

i.

8 peaches + 9 plums = ☐ fruits

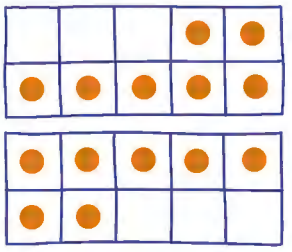
j.



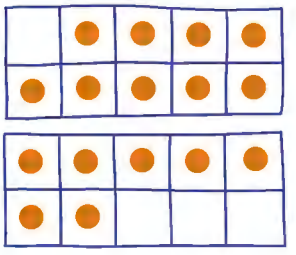
8 chillies + 10 cucumbers = ☐ vegetables

2. Let us try some with ten-frames:

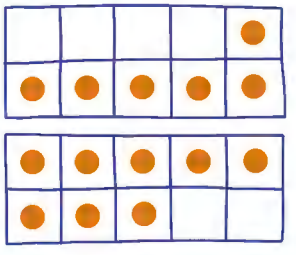
a. 7 + 7 = ◯



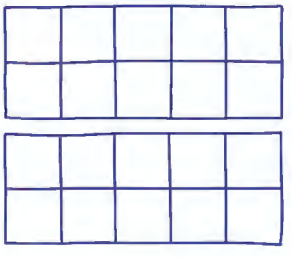
b. 9 + 7 = ◯



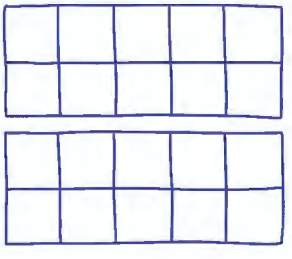
c. 6 + 8 = ◯



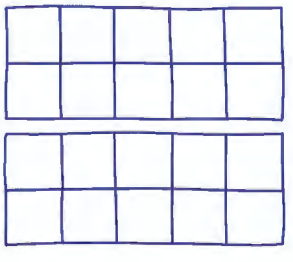
d. 5 + 9 = ◯



e. 8 + 7 = ◯



f. 6 + 6 = ◯



3. Let us add:

a. 11 + 8 = ◯

b. 12 + 3 = ◯

c. 7 + 4 = ◯

d. 8 + 5 = ◯

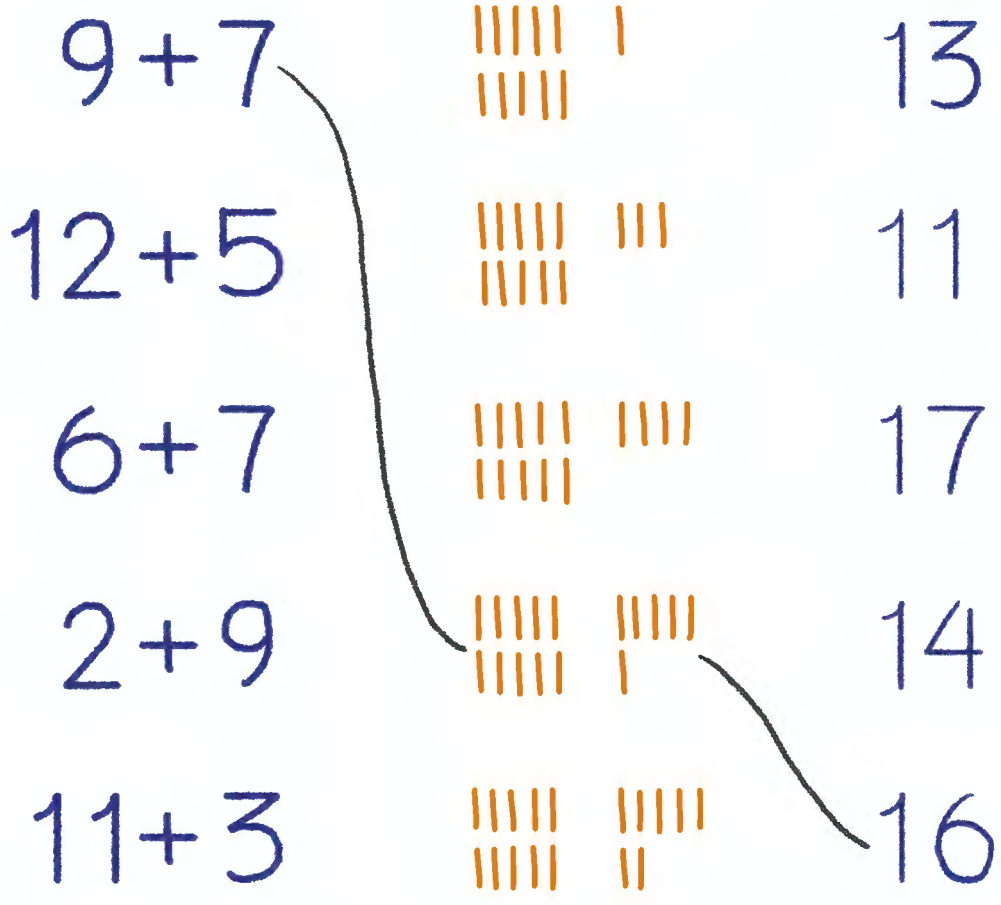
e. 5 + 14 = ◯

f. 6 + 13 = ◯

g. 16 + 2 = ◯

h. 13 + 6 = ◯

4. Match them right:



Neeraj's mother has 12 flowers.
How many can she put in her red vase and how many in blue vase?

◯ + ◯ = 12

◯ + ◯ = 12

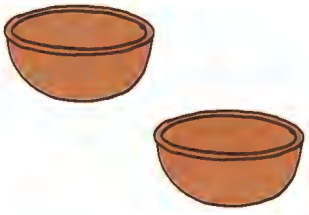
◯ + ◯ = 12

◯ + ◯ = 12

Teacher's Note: This exercise is open ended.

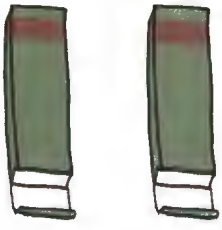
1. Make two groups:

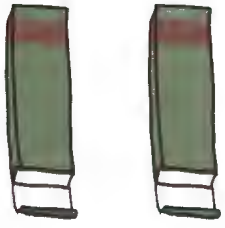
a.



( ) + ( ) = 9 ( ) + ( ) = 9

b.



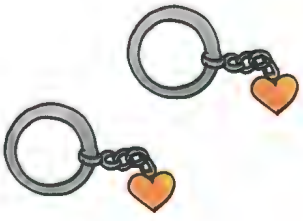


( ) + ( ) = 14 ( ) + ( ) = 14

c.

( ) + ( ) = 18 ( ) + ( ) = 18

d.



( ) + ( ) = 4 ( ) + ( ) = 4

2. Try these:

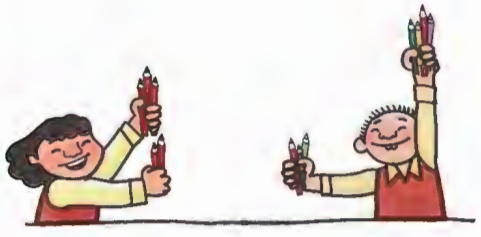
a. 13 + 6 = ◯ 6 + ◯ = 19

b. 11 + 3 = ◯ 3 + ◯ = 14

c. 12 + 5 = ◯ 5 + ◯ = 17

d. 8 + 4 = ◯ 4 + ◯ = 12

3. Durga has 5 colour pencils. Samant has 7 colour pencils. How many colour pencils do they have altogether?



4. 2 parrots sat on the tree. 3 more parrots joined them. How many parrots are on the tree?

5. 5 girls are playing with a skipping rope. 4 boys are playing marbles. How many children are playing?

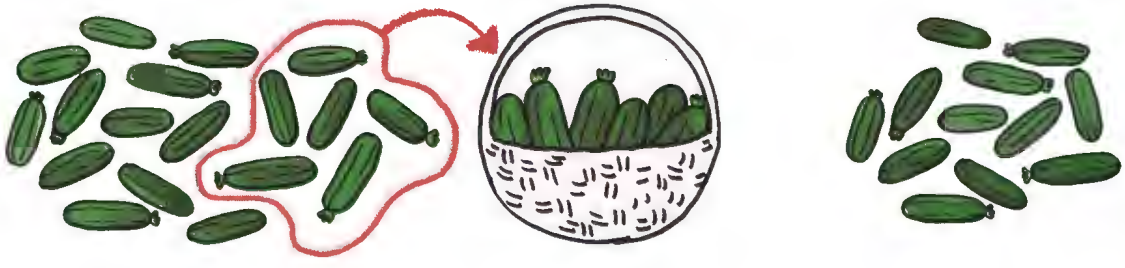
Back to Neeraj's Garden

This monsoon Neeraj's kitchen garden had lots of vegetables and fruits.

I shall share 18 cucumbers, 20 peaches, 2 big pumpkins, 19 tomatoes and 15 plums with my teachers, friends and neighbours.

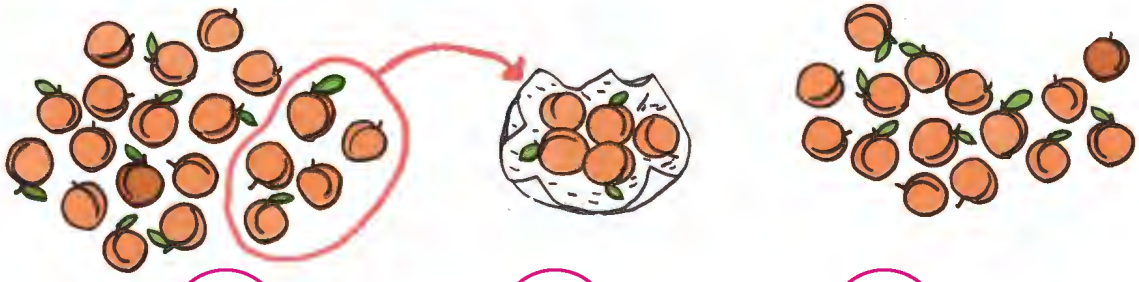
1. He made 10 pieces from each pumpkin. How many pieces of pumpkins did he make in all? _____ + _____ = _____

2. Neeraj gave 6 cucumbers to his teachers. How many are left?



18 – 6 = ◯

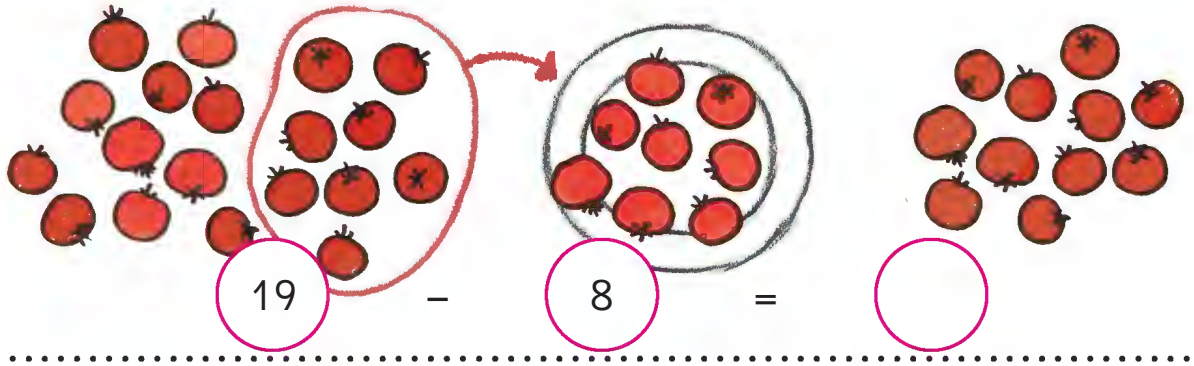
3. Neeraj's friend Rehana wanted to eat 5 peaches. How many peaches are left if Neeraj gives Rehana 5 peaches?



20 – 5 = ◯

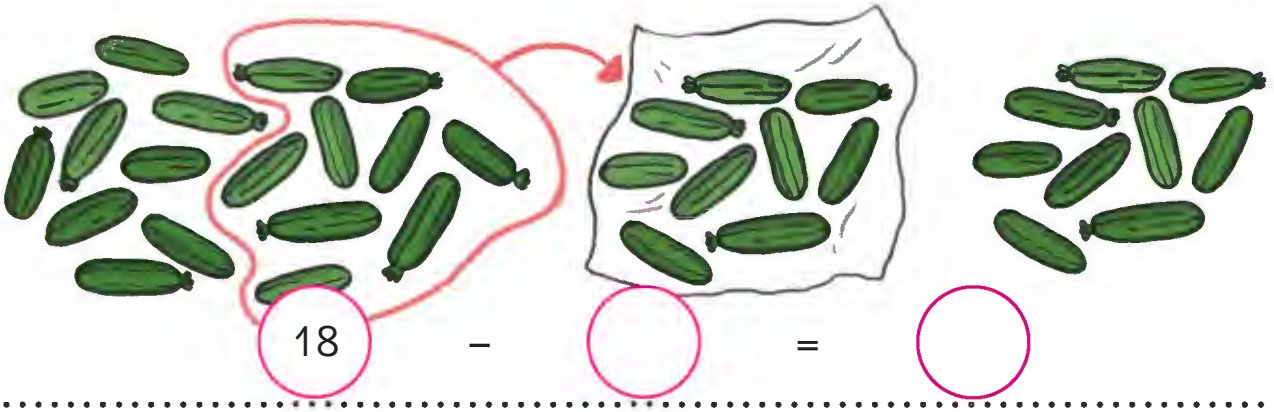
4. Let's do it:

a.



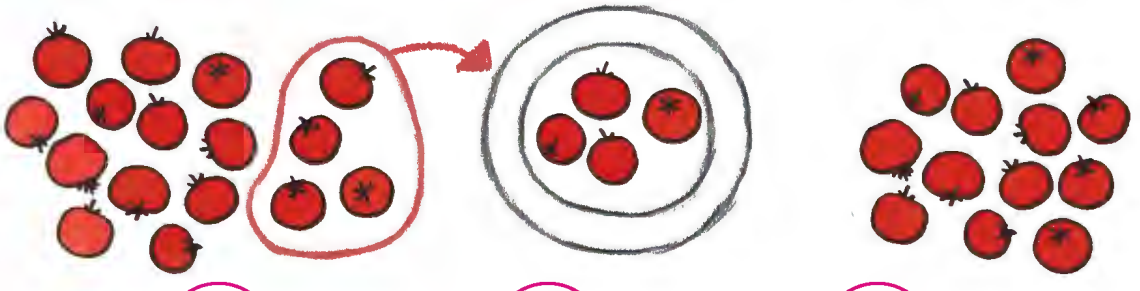
19 – 8 =

b.



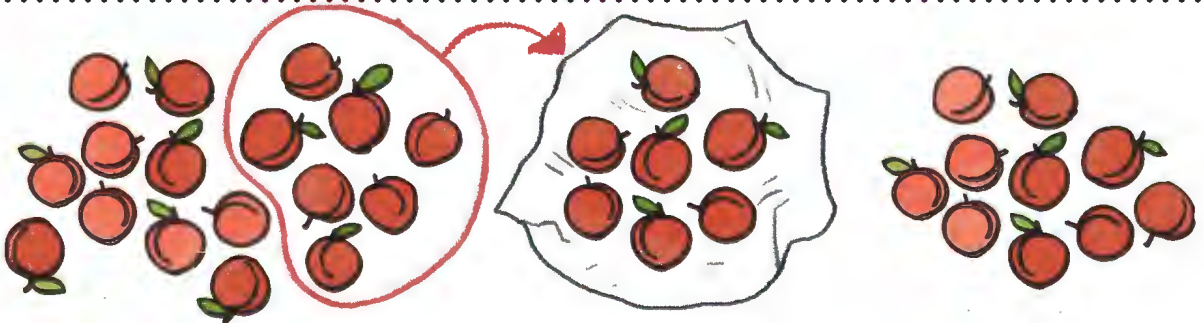
18 – ☐ =

c.



☐ – 4 =

d.

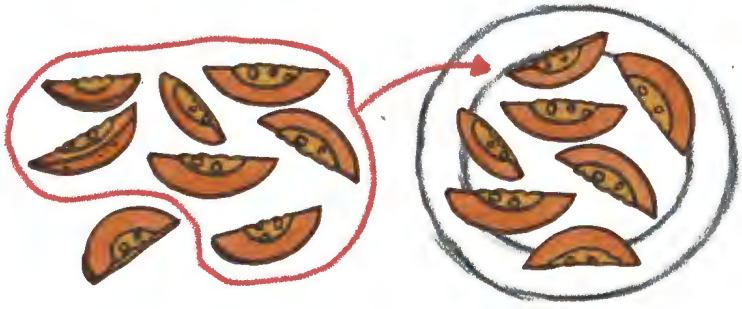


☐ – ☐ =

e.

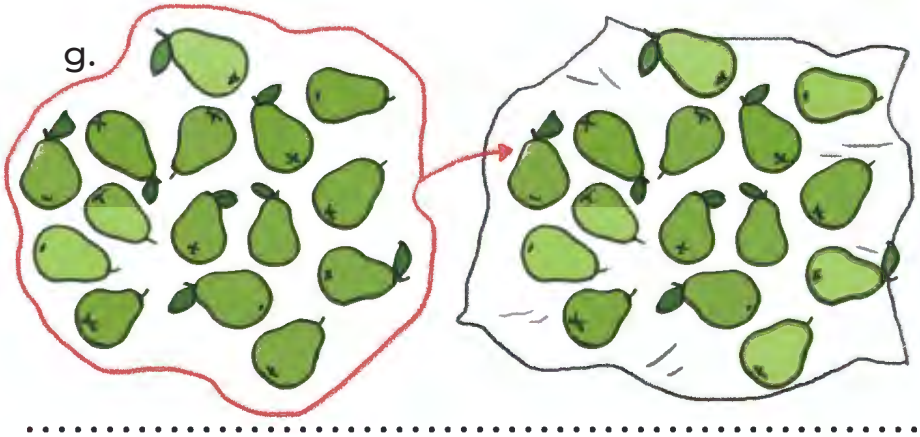
15 – 2 = ◯

f.



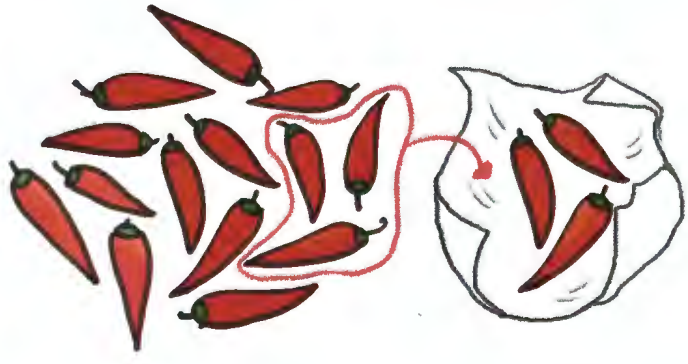
◯ – ◯ = ◯

g.



◯ – ◯ = ◯

h.



◯ – ◯ = ◯

5. Let us subtract

$$\begin{array}{r} 8 \\ -\ 3 \\ \hline 5 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \\ -\ 4 \\ \hline 12 \\ \hline \end{array}$$

a. (13) − (2) = ( )

b. (15) − (4) = ( )

c. (17) − (5) = ( )

d. (14) − (3) = ( )

e. $\begin{array}{r} 16 \\ -\ 4 \\ \hline \\ \hline \end{array}$

f. $\begin{array}{r} 19 \\ -\ 7 \\ \hline \\ \hline \end{array}$

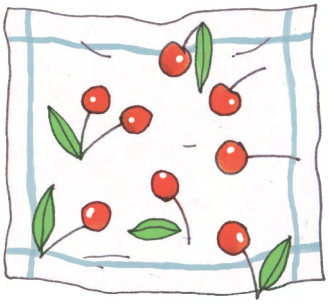
g. $\begin{array}{r} 13 \\ -\ 3 \\ \hline \\ \hline \end{array}$

h. $\begin{array}{r} 18 \\ -\ 11 \\ \hline \\ \hline \end{array}$

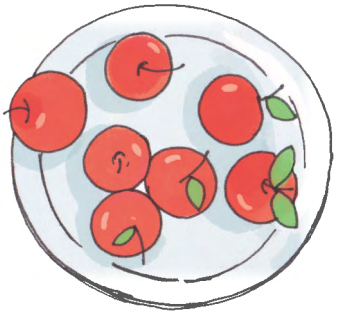
6. Try these:

a.	___ + 7 = 15	15 − 8 = ___	___ − 7 = 8
b.	12 + 4 = ___	___ − 4 = 12	16 − ___ = 4
c.	11 + ___ = 19	19 − ___ = 11	___ − 11 = 8
d.	___ + 13 = 20	___ − 13 = 7	20 − ___ = 13

7. Lucy has 8 cherries. She gave 5 cherries to her brother. How many cherries were left with Lucy?



8. There were 7 apples in the plate. I ate 2 apples. How many apples are there in the plate now?



9. Ravi has 13 pencils. Out of this, he gave 5 pencils to Myra. How many pencils are left with Ravi now?

8. Meeting Bigger Numbers

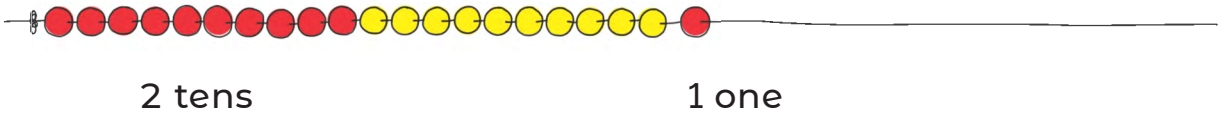
C5U3Q5

1. Circle the pile with bigger number:

a.

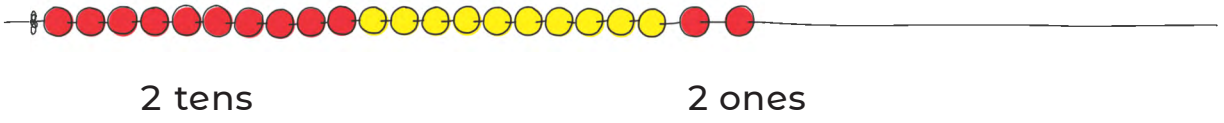
b.

c.



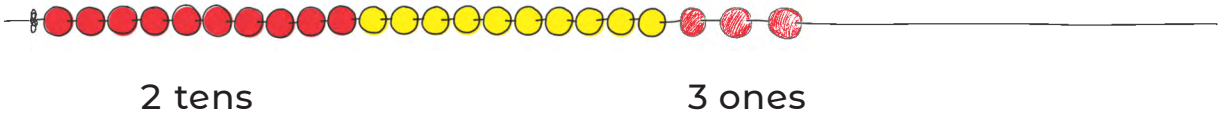
2 tens 1 one

21



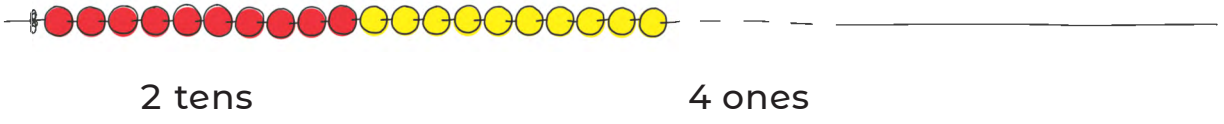
2 tens 2 ones

22



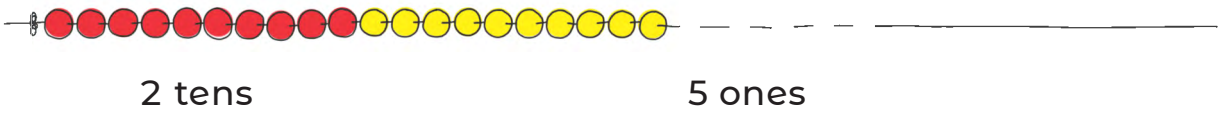
2 tens 3 ones

23

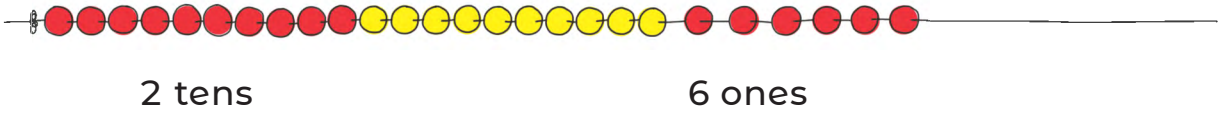


2 tens 4 ones

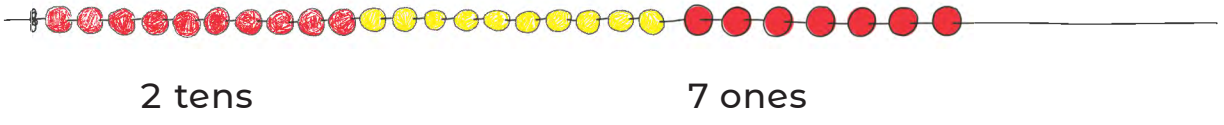
24



2 tens 5 ones



2 tens 6 ones

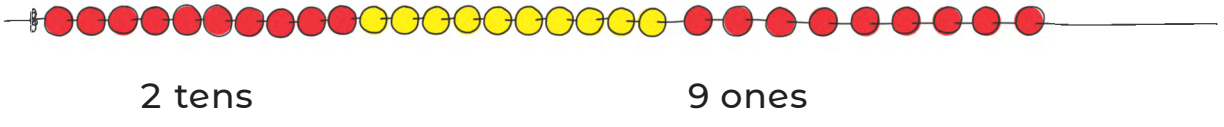


2 tens 7 ones

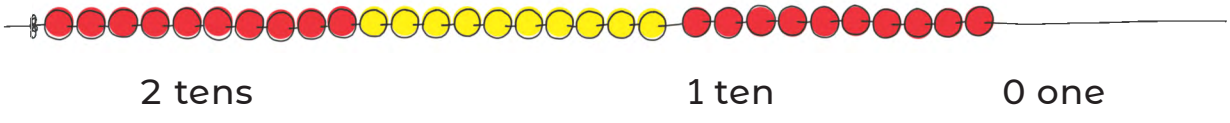
27

2 tens 8 ones

28

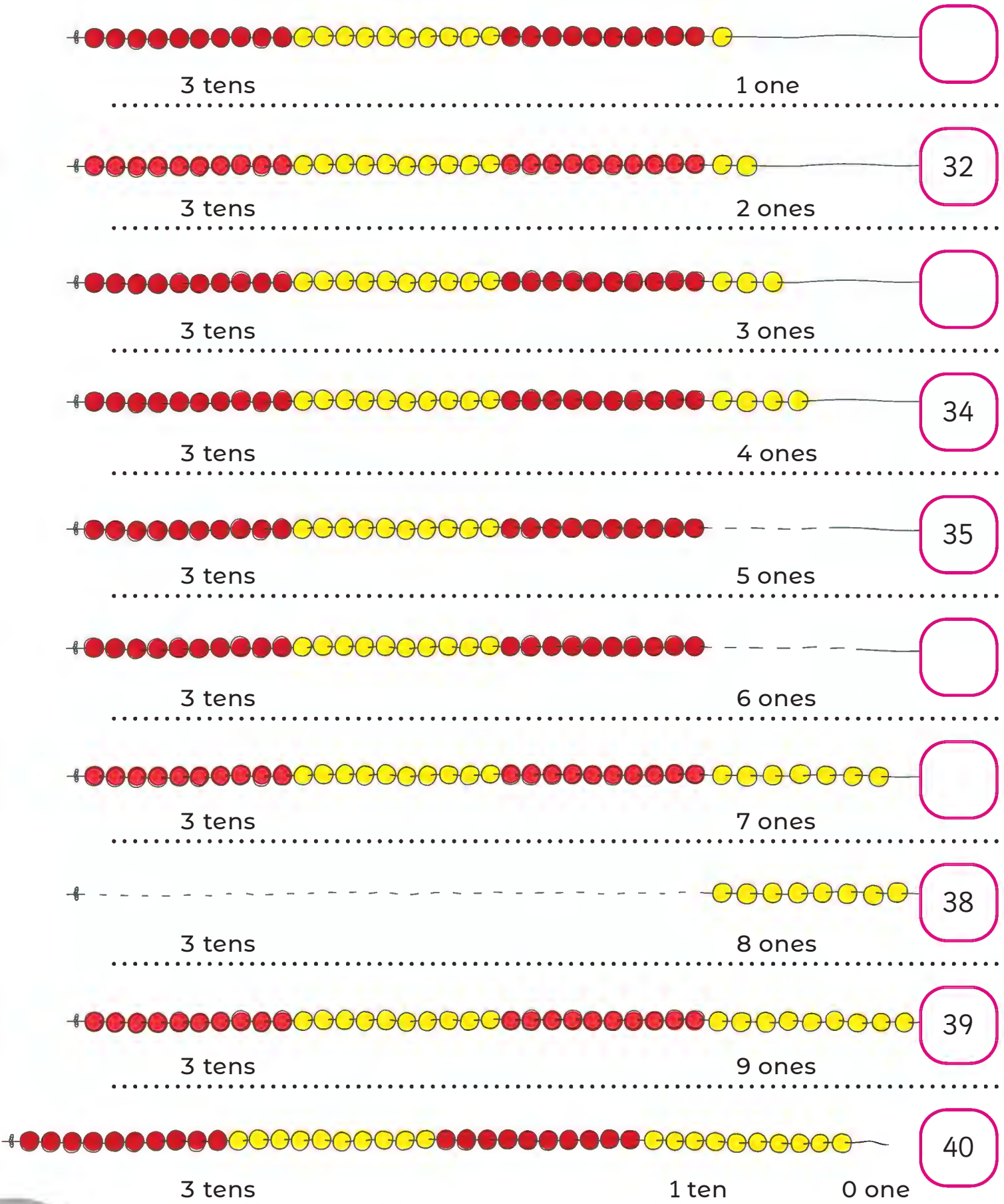


2 tens 9 ones



2 tens 1 ten 0 one

30


3 tens
1 one
3 tens
2 ones
32
3 tens
3 ones
3 tens
4 ones
34
3 tens
5 ones
35
3 tens
6 ones
3 tens
7 ones
3 tens
8 ones
38
3 tens
9 ones
39
3 tens
1 ten
0 one
40

4 tens
1 one

41

4 tens
2 ones

4 tens
3 ones

4 tens
4 ones

44

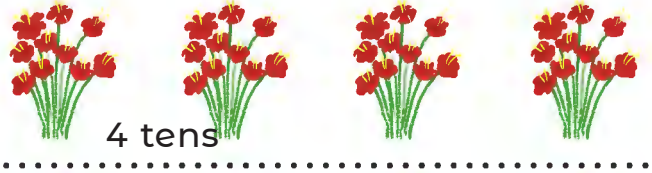
4 tens
5 ones

4 tens
6 ones

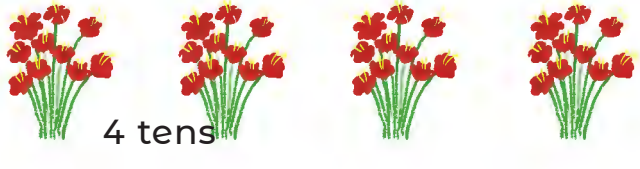
46

4 tens
7 ones

4 tens
8 ones


4 tens
9 ones

49


4 tens
1 ten
0 one

50

2. **Fill in the blanks:**

9
10
19
28
37
46

5 tens
1 one

51

5 tens
2 ones

5 tens
3 ones

53

5 tens
4 ones

5 tens
5 ones

5 tens
6 ones

5 tens
7 ones

57

5 tens
8 ones

58

5 tens
9 ones

5 tens
1 ten
0 one

60

6 tens

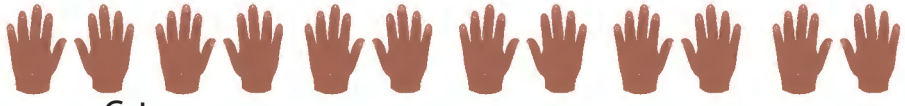
1 one

6 tens

2 ones

6 tens

3 ones


6 tens

4 ones

64

6 tens

5 ones

6 tens

6 ones

66

6 tens

7 ones

67

6 tens

8 ones

6 tens

9 ones

69

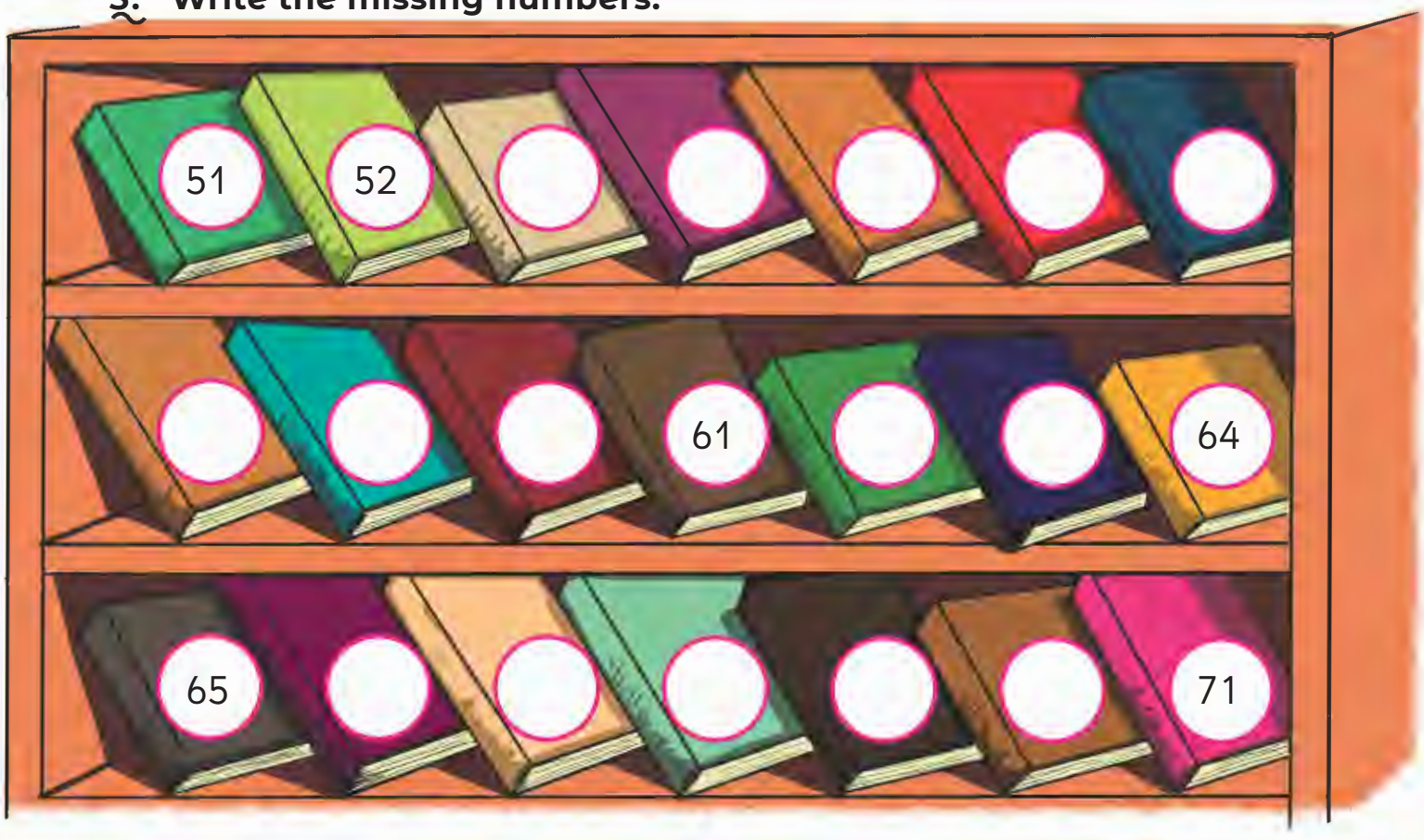
6 tens

1 ten

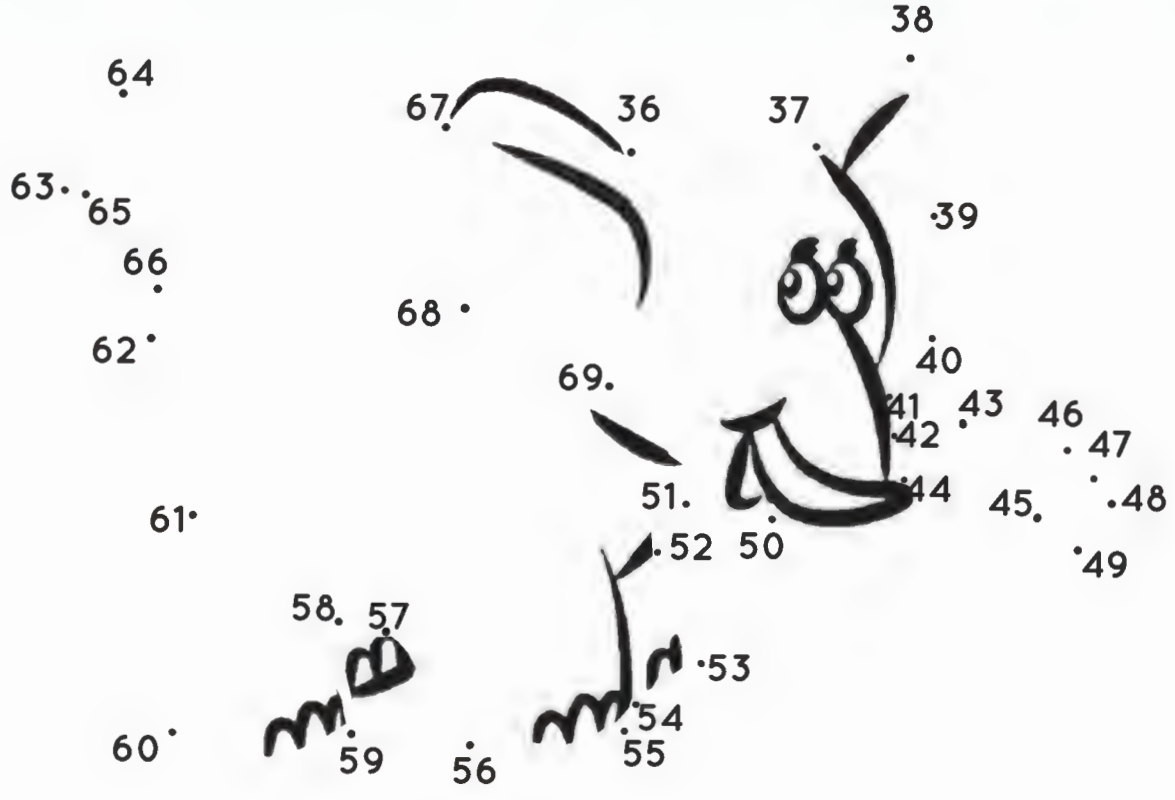
0 one

70

3. Write the missing numbers:



4. Join in order:



7 tens

1 one

71

7 tens

2 ones

72

7 tens

3 ones

7 tens

4 ones

7 tens

5 ones

75

7 tens

6 ones

7 tens

7 ones

7 tens

8 ones

78

7 tens

9 ones

79

7 tens

1 ten

0 one

80

8 tens

1 one

81

8 tens

2 ones

82

8 tens

3 ones

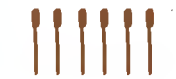
8 tens

4 ones

8 tens

5 ones

8 tens


6 ones

8 tens

7 ones

87

8 tens

8 ones

88

8 tens

9 ones

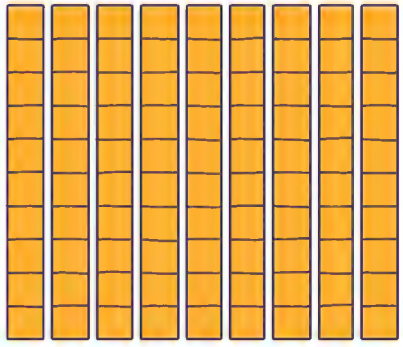
89

8 tens

1 ten

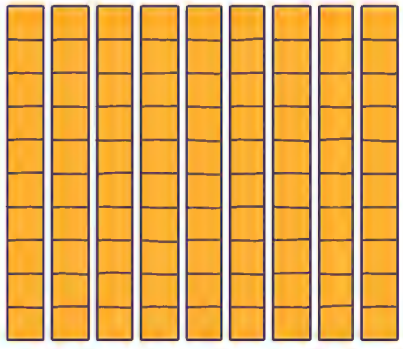
0 one

90

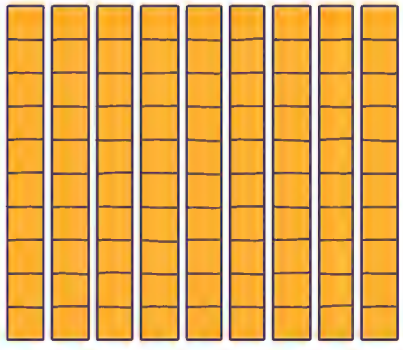


9 tens 1 one

91

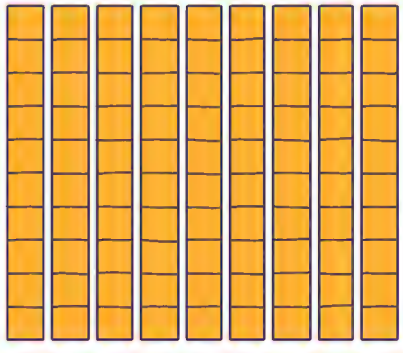


9 tens 2 ones

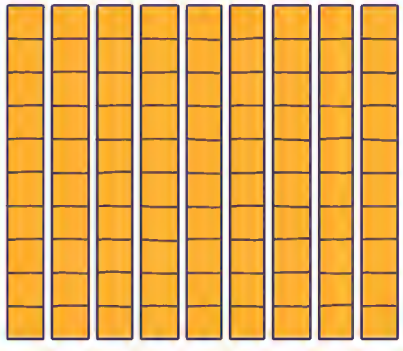


9 tens 3 ones

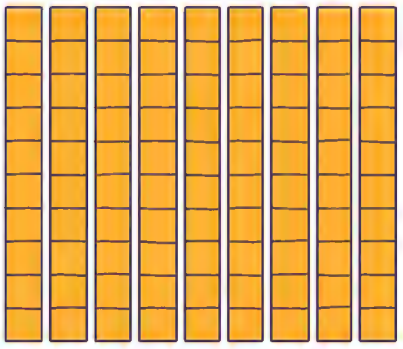
93



9 tens 4 ones



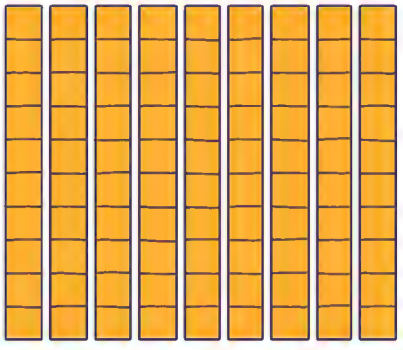
9 tens 5 ones



9 tens

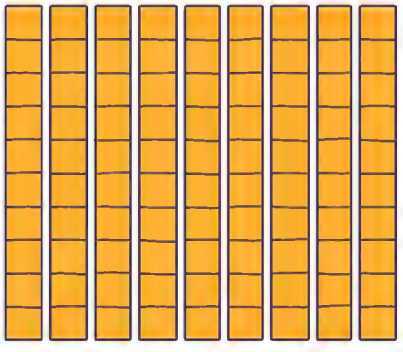
6 ones

96



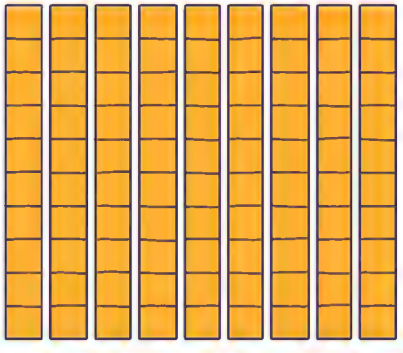
9 tens

7 ones



9 tens

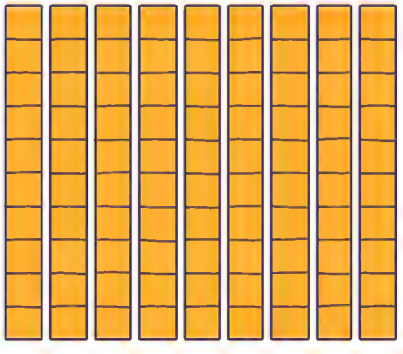
8 ones



9 tens

9 ones

99

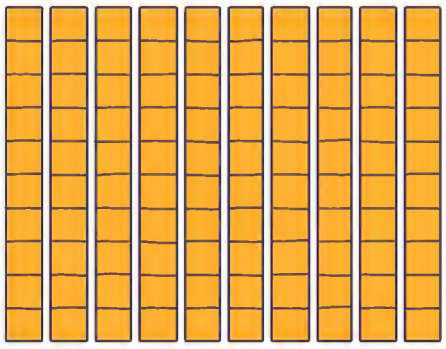


9 tens

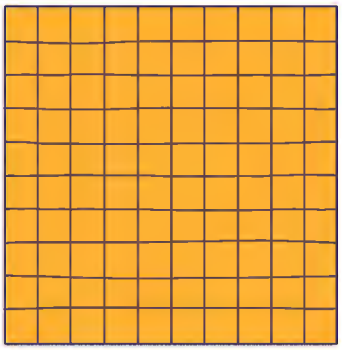
1 ten

0 one

100

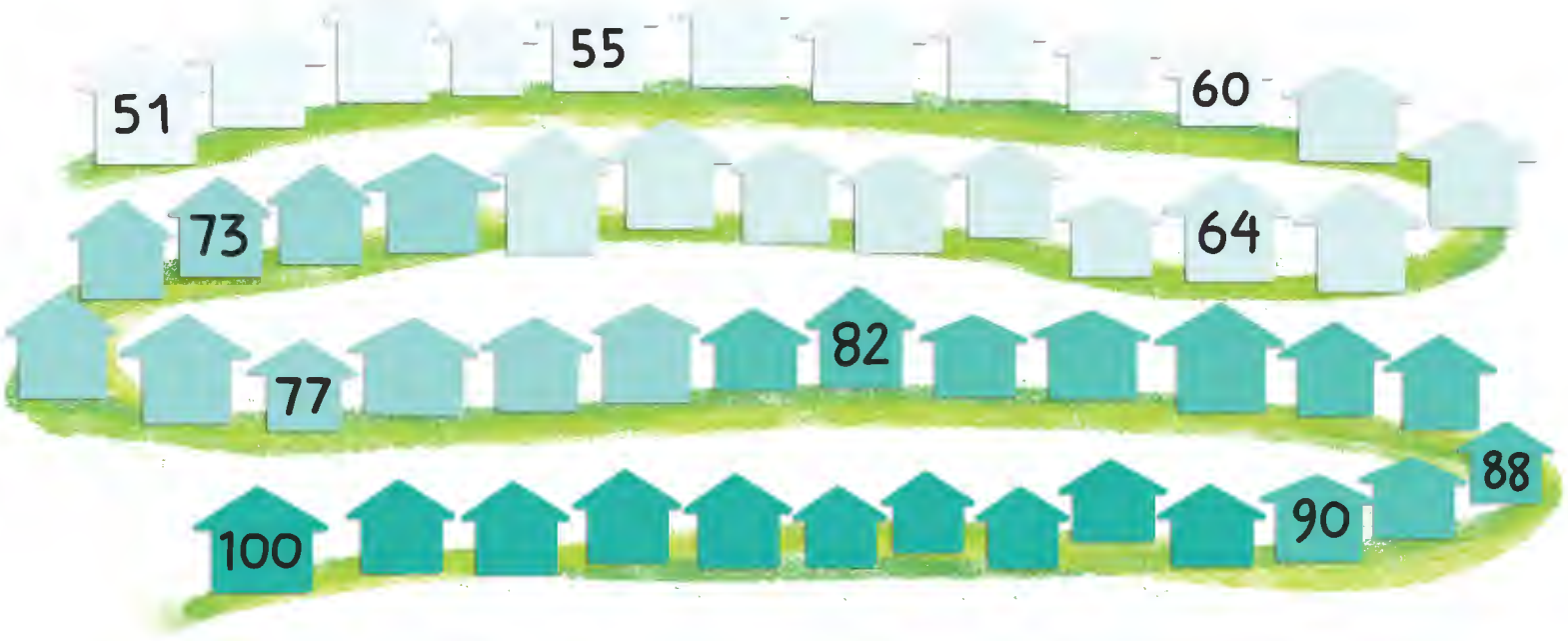


10 tens



1 hundred

5. **Write the house numbers:**



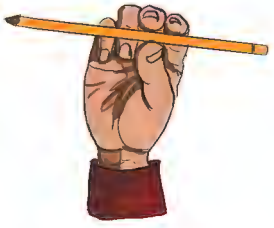
6. **Join in order:**

9. How Long, How Heavy

J1T2M7

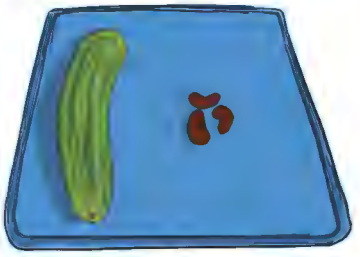
Length

Longer-Shorter



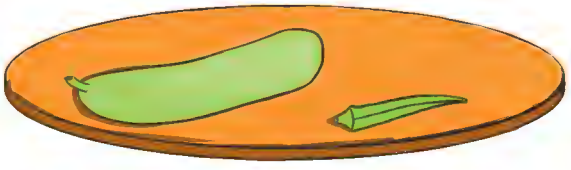
Longer

Shorter

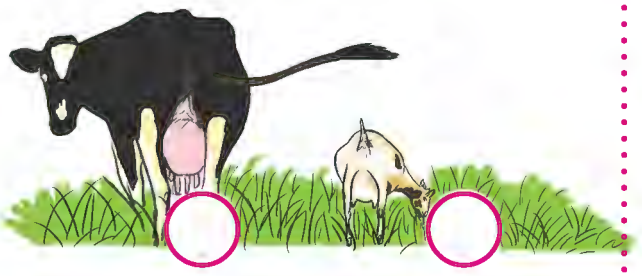


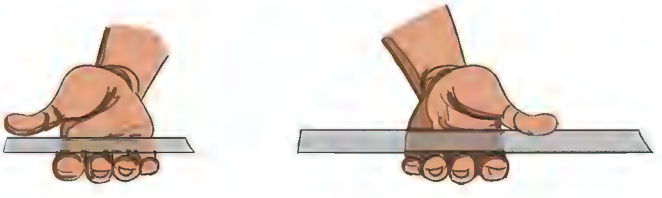
Longer Shorter

1. Tick ✓ the one that is longer:



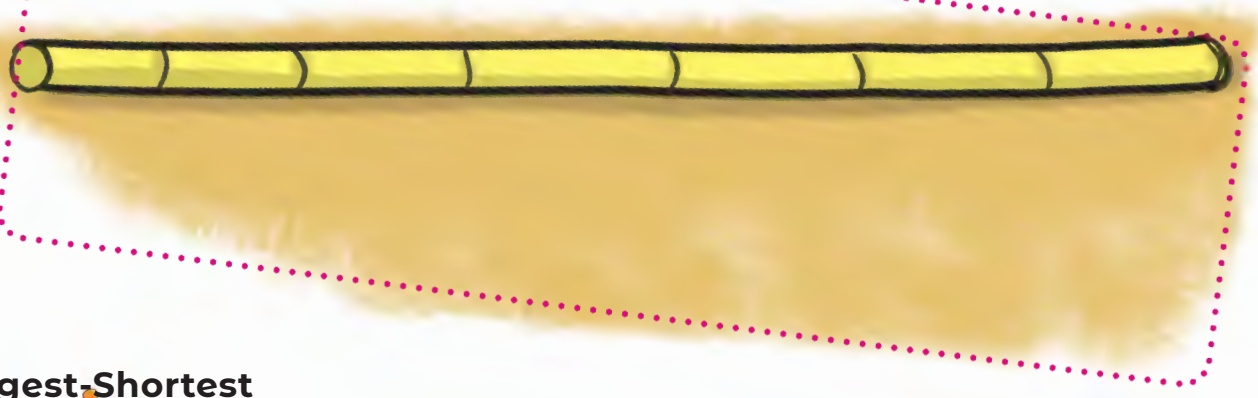
2. Tick ✓ the one that is shorter:





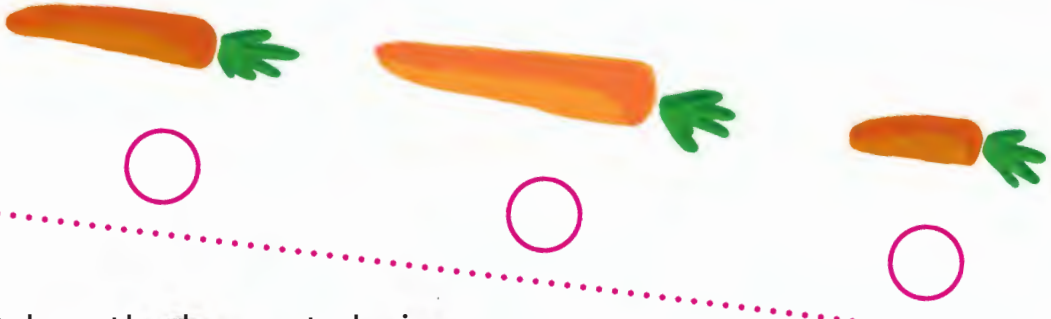
3. Draw a shoe lace longer than this one

1. Draw a bamboo shorter than this one



Longest-Shortest

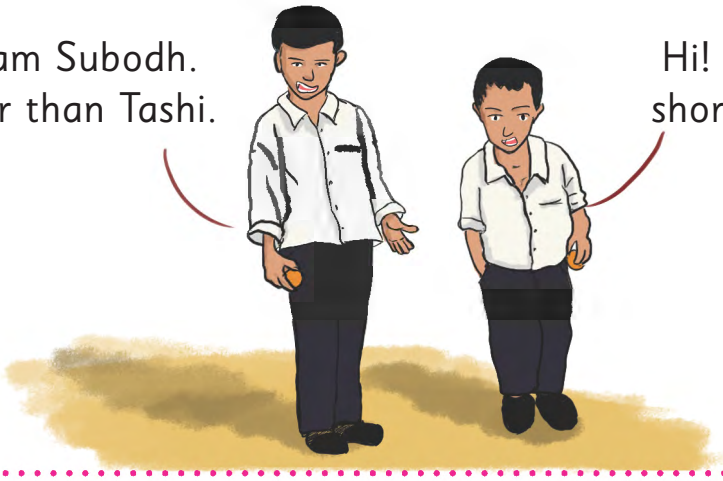
1. Tick ✓ the shortest carrot



2. Colour the longest chain

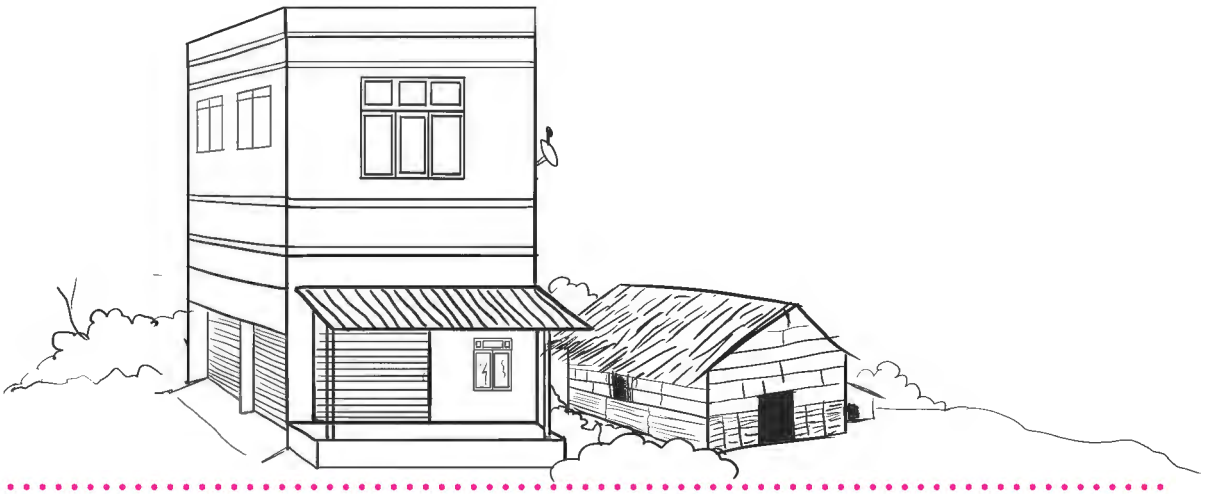
Taller-Shorter

Hello! I am Subodh.
I am taller than Tashi.

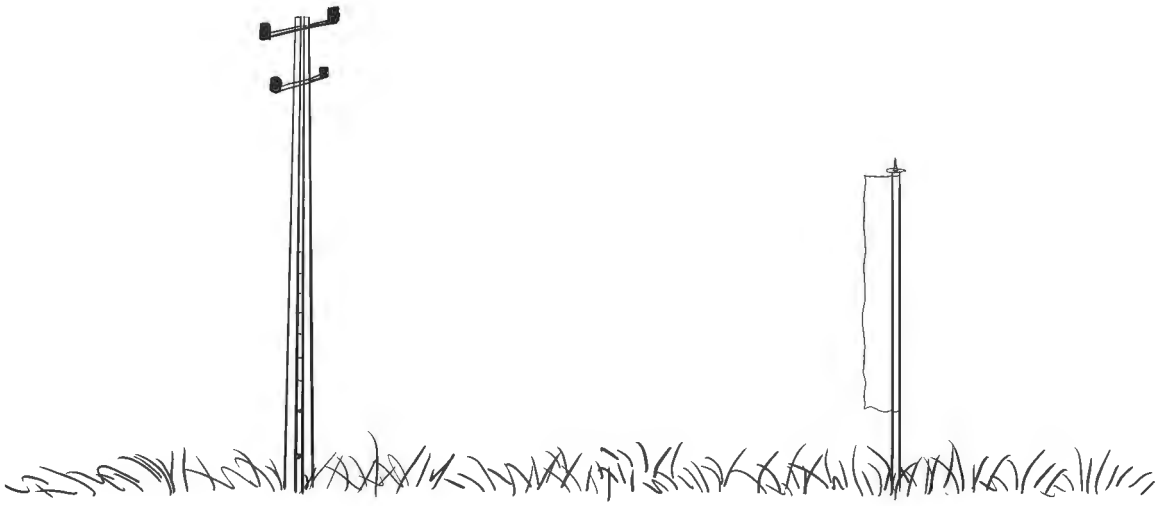


Hi! I am Tashi. I am
shorter than Subodh.

1. Colour the taller house



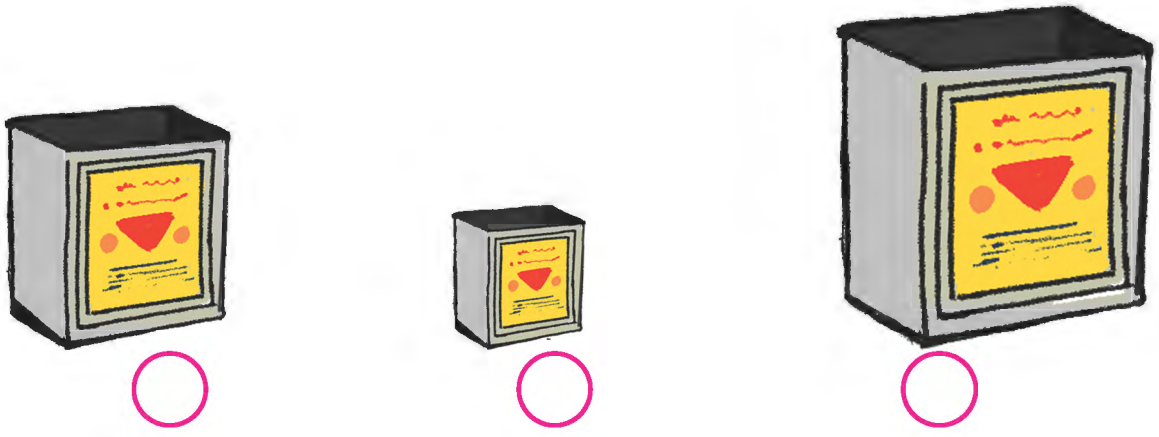
2. Colour the shorter post



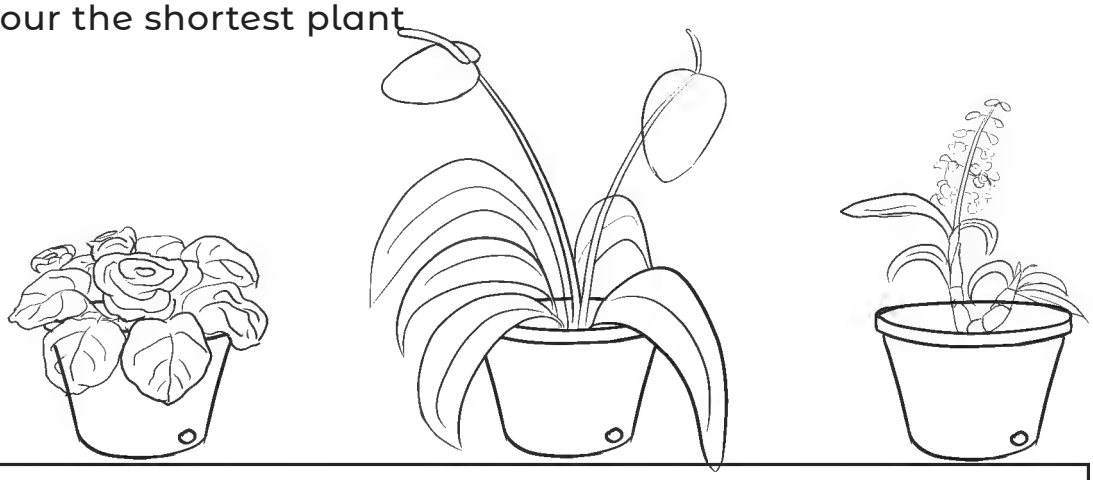
Tallest-Shortest

1. Circle the tallest and colour the shortest in the picture.

2. Tick ✓ the tallest tin box.

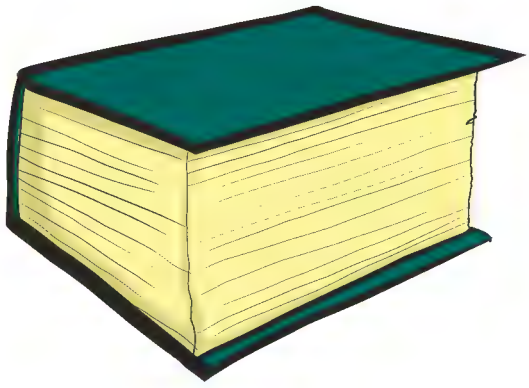


3. Colour the shortest plant.



Teacher's Note: Get the children to find out- How many members are there in your family? Who is the shortest among them? Who is the tallest in your family? Then in the class, ask all the children to stand in a line as per their height. Name a friend who is taller than you. Name a friend who is shorter than you.

Thicker-Thinner

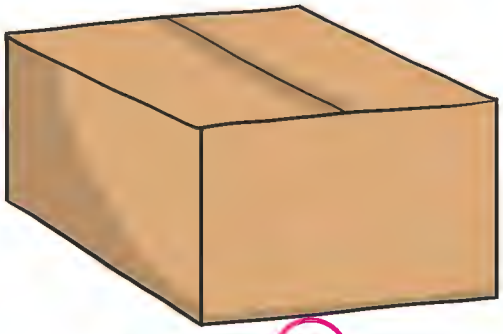


Thicker

Thinner

1. Tick ✓ the thicker one

2. Tick ✓ the thinner one:

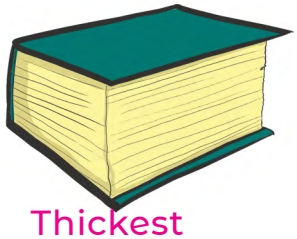


Teacher's Note: Demonstrate real objects to identify thicker and thinner.

Thickest-Thinnest

Look at the picture below

Thinnest

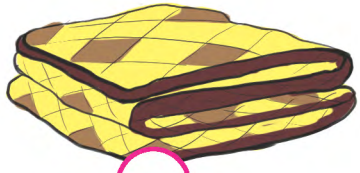


Thickest

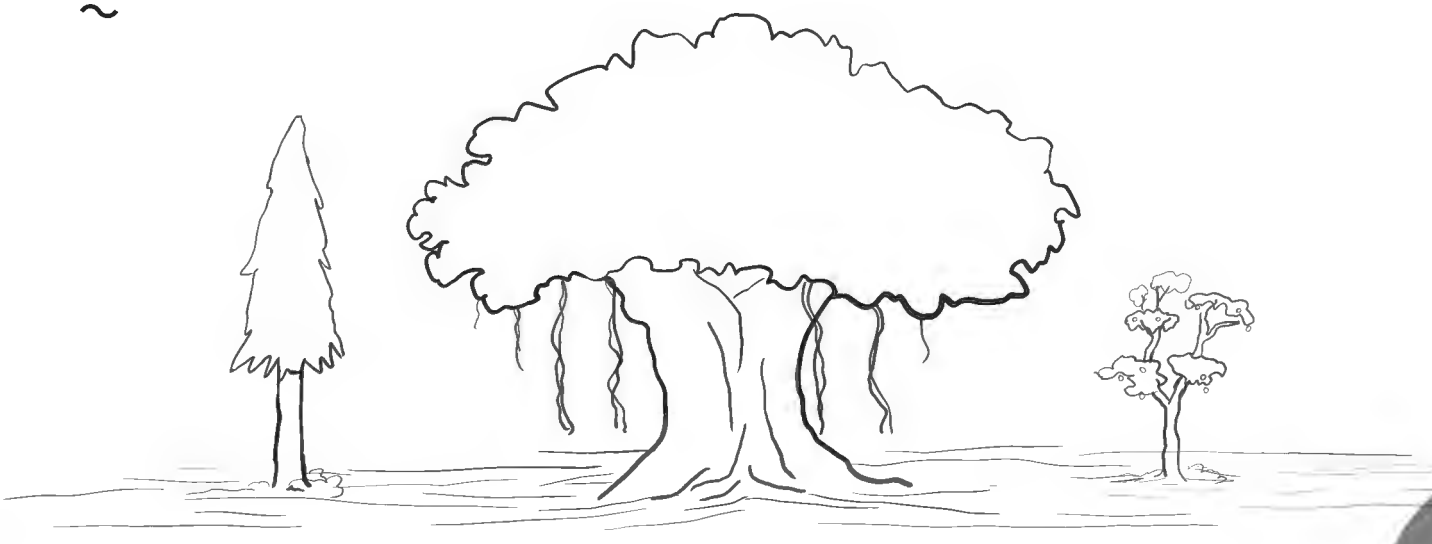
Thinnest

Thickest

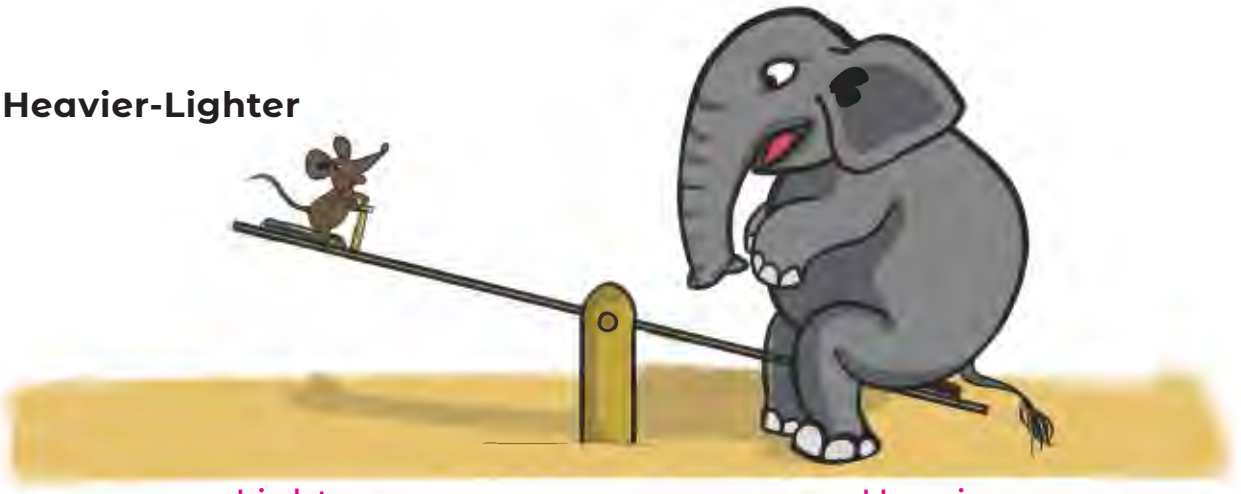
1. Tick ✓ the thinnest blanket



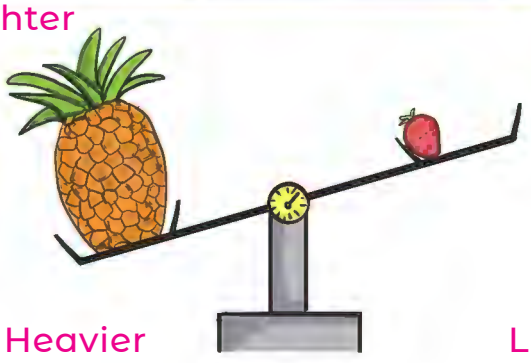
2. Colour the thickest tree



Heavier-Lighter

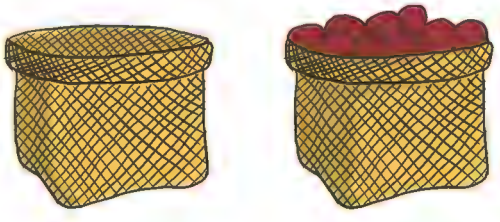


Lighter Heavier

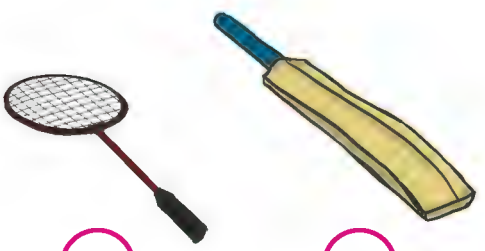


Heavier Lighter

1. Tick ✓ the heavier one



2. Tick ✓ the lighter one:

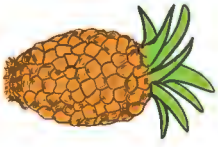


Heaviest-Lightest

Lightest

Heaviest

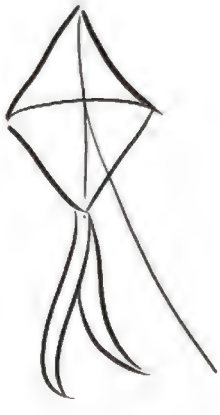
Lightest

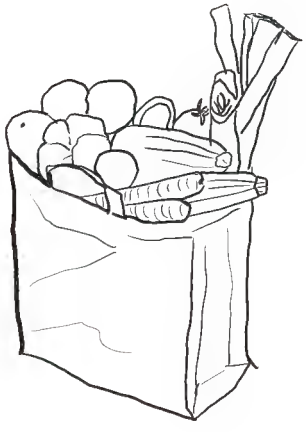


Heaviest

1. Tick ✓ the heaviest one:

2. Colour the lightest one:

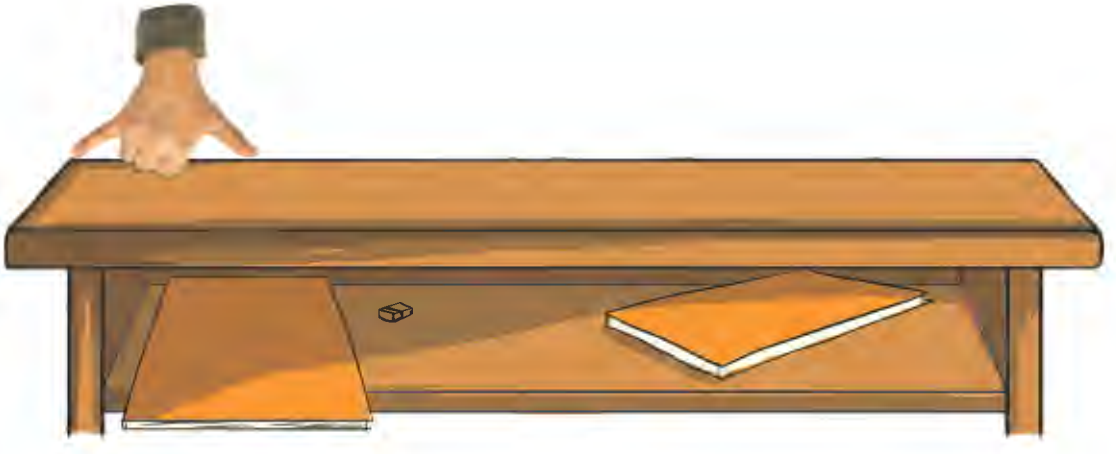




Measurement

Hand Span Foot Fingers Cubit

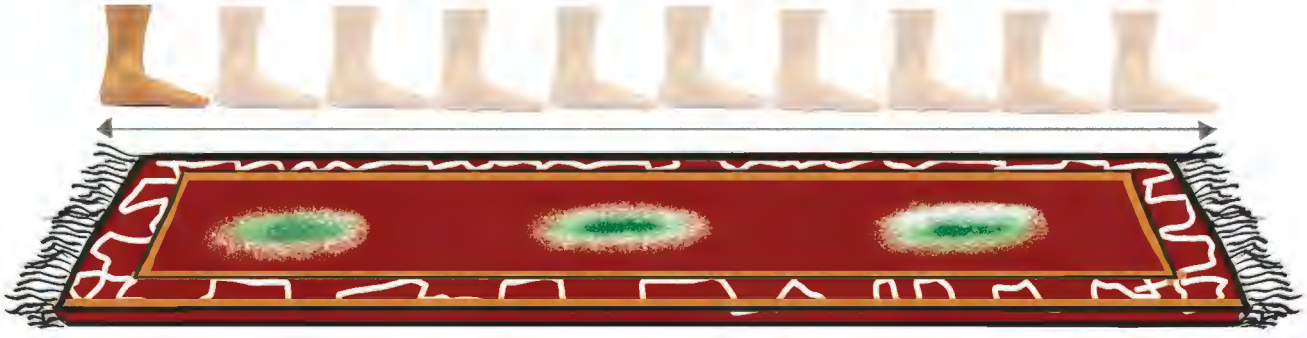
1. The book is (3) hand spans long.



2. The table is ( ) hand spans long.

Teacher's Note: Get the children to do some activities with the real objects such as books, table and distances. Measure these with the units shown above.

3. The book is ( ) hand spans long.

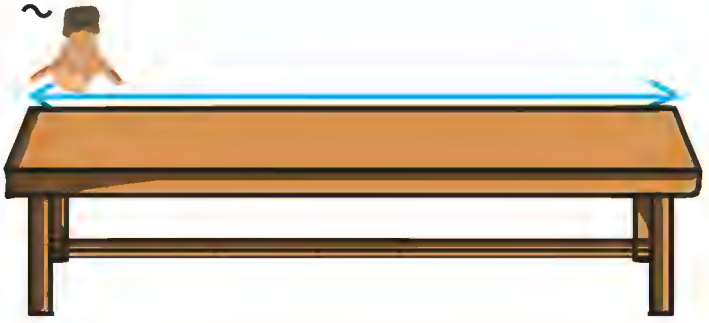


4. The carpet is (10) feet long.

5. The mat is ( ) feet long.

Let us measure the following:

1.



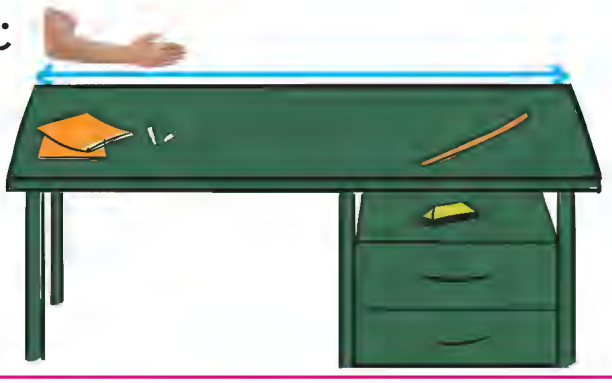
Your measurement

◯ Spans

Your friend's measurement

◯ Spans

2.



Your measurement

◯ Cubits

Your friend's measurement

◯ Cubits

3.

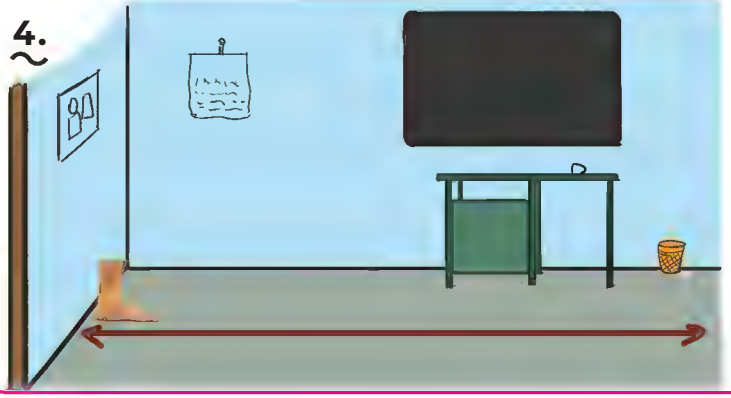
Your measurement

◯ Fingers

Your friend's measurement

◯ Fingers

4.



Your measurement

◯ Feet

Your friend's measurement

◯ Feet

Let us go outside:

1. Use your hands or feet to find-

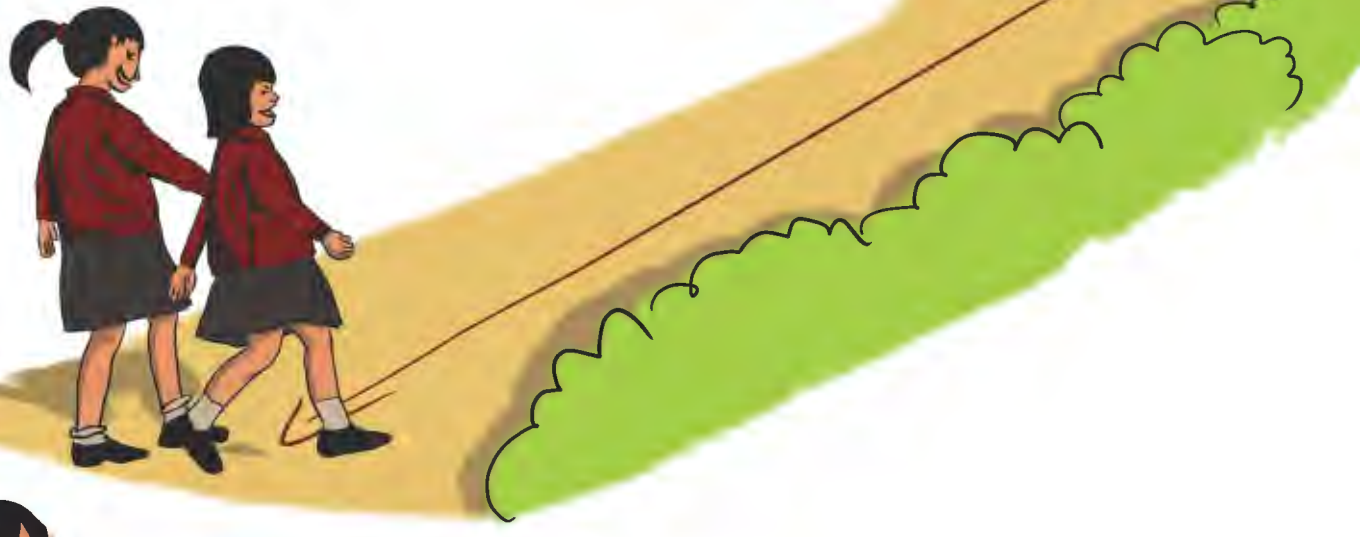
a. The longest shadow.

b. The longest bench.

Let us walk in the park:

How many steps would i need to reach that tree?

Let us walk and find how many steps we need.



30 steps from the tree.

2. Guess the distance from your classroom to your school ground.

Teacher's Note: Using the classroom space the teacher may do the various activities to help the children understand the concept of length.

10. Notes and Coins

S3P7Z6

1. Discuss with your friends and tell.

   a. What do you give to the shopkeeper to buy things from his/her shop?

Indian currency in coins

₹1

₹2

₹5

₹10

Indian currency in notes

₹100

₹50

₹20

₹10

₹5

2. Count the coins and colour the correct bubble

a.

₹8 ₹10 ₹6

b.

₹9 ₹12 ₹15

c.

₹10 ₹20 ₹15

d.

₹12 ₹20 ₹15

e.

₹7 ₹5 ₹10

3. Match the things with their prices

a. Why do you think that a ball costs more than a toffee?

Fun Activities

The children will roll out a dice and look at the dots on the dice and pick up a coin or coins with the equal value and make a tower of coins till it falls.

4. Draw the notes and coins to make

a. ₹ 15

b. ₹ 7

c. ₹ 12

d. ₹ 9

e. ₹ 16

5. Find out:

a. Cost of your maths textbook
b. Travel fare from your home to school
c. Cost of your favourite fruit and vegetable
d. Cost of a post card
e. Cost of an inland letter

Why do you think it costs this much?

11. Watch and Tell

F7V1F8

1. Look at the picture

   a. How many children are there in the picture?

   b. How many are wearing ?

   c. How many women are wearing ?

   d. How many men and women are wearing ?

2. Count the shapes in the above picture

3. Count the number of flowers

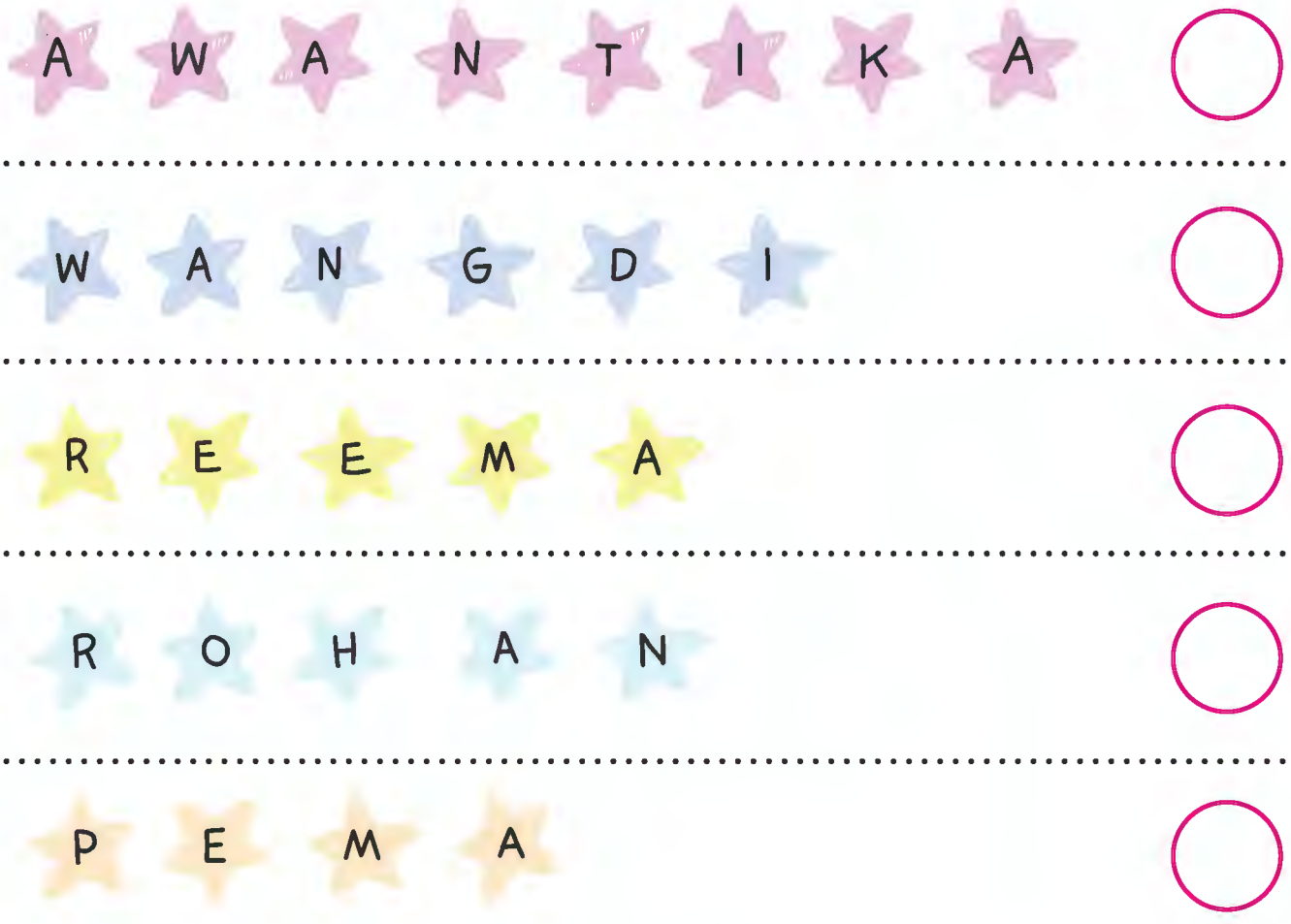
a. Number of marigold _____

b. There are 5 _____ flowers.

c. _____ flowers are more than _____ flowers.

Teacher's Note: In the above exercise the teacher should explain the relevance of flowers in our Sikkimese culture.

4. Let's count the numbers of letters in each name:



a. How many names have 4 letters?

b. How many have 6 letters?

c. How many times does A come in all the names taken together?

d. How many times does E come in all the names taken together?

e. How many times does X come in all the names taken together?

Teacher's Note: Let the children write the names of their friends and let them find out the number of various letters as done above.

Teacher's Page

• SHAPES AND SPACES •

Spatial understanding involves understanding how various objects in our surroundings are spatially related to each other as well as understanding different features of various shapes that we see. Well-developed spatial sense helps children learn numbers and measurement better. Therefore it is the first chapter of the book.

Spatial Understanding is also important for understanding community needs for sustainability. For this, it is important for children to be able to talk about things in their environment and community. The vocabulary should be developed for objects indoors and objects outdoors, as this will enable them to communicate about the relationship among things in their environment and community.

In spatial understanding, children need to learn the vocabulary including inside-outside, on-under, above-below, top-bottom on how things (living and non-living) are spatially related. Also they need to understand bigger-smaller and biggest-smallest relating to size of various things and shapes.

Stories are a good way to introduce this vocabulary. At this level, stories including those in the chapter should be read out to the children. It is advisable that the stories are enacted by them since that will help them understand the vocabulary through direct experience. One such story is:

The Sweet Toothed Black Bear

Munal lived in Mangshila, a village high **above** in the hills of North Sikkim. Her mother wanted her to take a basket of sweet homemade laddoos to her grandmother who lived **far** away. Munal had to walk through the forest to reach her grandmother's house.

As Munal was humming and walking through the forest, she saw a big black bear (Bhaloo) lying **below** a tree, looking at her from **top** to **bottom** with his eyes. She suddenly remembered that her mother had asked her to be careful of wild animals.

Munal was clever. So she stood **far** from the bear and started to think. To her surprise, the bear spoke to her in his growly voice, "Hello, little girl! Don't be afraid of me. Today I have eaten a lot of pomsies [wild avocados]. Now I want to eat something sweet." She replied, "Hello Bhalooji! I am so excited to meet you!"

Munal's head was full of thoughts about whether to give him some laddoos or not. After all they were meant for her granny. Finally she decided to give him some. She told the bear, "Today is your lucky day. I have some delicious laddoos in my basket. Would you like to have some?" and the bear said, "Of Course!"

> Munal asked the Bear to stay where he was and open his mouth as **big** as he could. She walked **nearer** to him, but not too **near** and started to throw the laddoos **inside** the bear's mouth one at a time. There were ten laddoos in the basket. Some laddoos were **big** and some laddoos were **small**. One or two big laddoos struck at the bears teeth and fell **outside** his mouth, and **rolled on** the ground.
>
> When the basket was empty, the bear told Munal that they were the sweetest laddoos he had ever eaten. He thanked Munal and told her to go on her way without fear.
>
> Munal told her grandmother about her adventure, who was relieved to see her grandchild safe and sound. She told Munal, "You are more precious to me than all the laddoos in the world. We will make many sweeter laddoos together now."

While reading the teacher can make it interactive by asking questions like 'Where was the village?', 'Where was Bhaloo?' etc.

This can be followed by a throwing activity where children aim to throw chalk pieces (or balls) **inside** a box. Some of course would fall **outside**. The box can be kept on a chair or **under** the table. The box can be kept **(i) nearer** to the children and **(ii) farther** away and they can compare the two situations **(i)** and **(ii)** and find out when they aimed better i.e. when more chalks (or balls) went inside.

It is important that children understand that inside-outside can be relative. Put an eraser inside the chalk box and keep a pencil outside on the table. Children should be able to identify that the eraser is inside and the pencil is outside. Then ask, is the pencil inside the classroom. Find something (e.g. a tree or a bench) outside the class and ask if that is inside or outside the classroom. These will help children understand that inside-outside is relative to the inside of something.

The teacher can do various activities with simple objects in the classroom to understand on-under and above-below. It is a good idea to take the children outside class and observe the surrounding and ask them find 'What is under that bush?', 'What is on the roof?' etc.

For top and bottom children can be asked to stack their fists one over the other and asked "whose fist is on top" or "whose fist is at the bottom". The fists can be interchanged and the questions can be repeated "now, whose fist is at the bottom" etc.

For size, children should understand that bigger-smaller are used to compare two things and biggest-smallest for more than two things.

1. Bigger-smaller can be introduced with pairs of objects like two bottles of different sizes, father's shirt and the child's shirt, match box and pencil box, mouse and goat etc.
2. Once children are familiar with these words, the teacher ask them to find objects smaller than the chalk box or bigger than the eraser.
3. Then the teacher can show three objects e.g. three boxes of different sizes so that one fit within the other and ask children to find the smallest and the biggest.

4. Once children are familiar with these two words, the teacher can bring up to 5 similar objects and ask children to arrange them smallest to biggest. This seriation activity is foundational for understanding bigger and smaller numbers later on.

For 3D Shapes, children need to be exposed to a collection of objects including various balls, boxes, pipes and cylinders, cones. Children should be asked to sort them as they wish. But they should be asked what is the basis of sorting. At this level, children may use "box like", "ball like", "pipe like" etc. to describe cubical, spherical and cylindrical objects.

As part of sorting, they can try to see which objects roll and which can slide. This is a child-friendly way to making them aware of curved surfaces and plane surfaces. After some understanding children should be blind-folded and given some object to hold and feel. Then they can be asked whether it rolls or slides.

Once they develop an understanding of sorting objects into cuboid or "box like", cylinder or "pipe like", cone and sphere or "ball like", then they can be blind folded and asked to feel and object and tell which category it falls into. Caution should be taken to not give them any object that is a combination of two or more shapes.

For 2D shapes, simple cardboard cut-outs are very good. These can also help children identify, say, a triangle regardless of its orientation.

☞ The teacher can refer to http://www.teachersofindia.org/en/article/pullout-section-november-2014-geometry for various pedagogical concerns and many age-appropriate activities.

• NUMBERS •

As the children come to school in Class 1, they come with exposure to numerals (e.g. 1, 2, 3...) and number name recitations. But they may not have developed a sense of quantity and how it connects with numbers i.e. they may not be able to count confidently and correctly. It is important to let them experience the need to count before asking them to master counting. Also, they need to start playing with the numbers they have learnt to develop their number sense. So before-after-in between, ordering numbers – 'small to big' and 'big to small' – and finally addition-subtraction should be done after children learn numbers up to 9 as well as after 20. Playing with larger numbers primarily requires breaking them in to tens and ones. Based on the syllabus, they are included in Class 2. However, the visuals included in the chapters as well as the manipulatives suggested here do provide exposure to such decomposition of larger 2-digit numbers in to ten and ones.

Pre-Number Concepts

Before giving experience of counting numbers, it is important to provide experience of certain pre-number concepts which will help children to understand the meaning of numbers and the relationships these numbers have with each other. Pre-number concepts like classification (sorting or grouping), seriation, one to one correspondence, and comparing helps children to associate quantities with the

numbers and also establish relationships numbers have with each other.

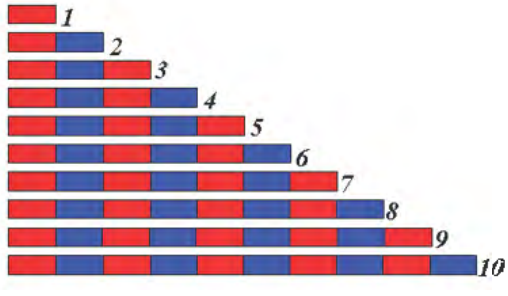
Classification (sorting into non-overlapping groups): This is common to us and is part of our daily activities. It may or may not involve numbers. However, it is important concept for any meaningful number work. For instance, if one needs to find the number of carrots, the first task one needs to do is to sort the carrots from the vegetable basket. Here one looks for that specific attribute that becomes criteria to separate the one required from the others. The chapter, 'Watch and Tell', in general provides the scope to sort (and count). Various classification activities can be designed for young children as indicated in the Teacher Page for Looking Around.

One-to-One Matching (object to object correspondence): This is again seen as real-life activity. Children in their various activities try to make object to object correspondence. For instance, children must be engaged with tasks such as matching the number of objects in a given set with corresponding objects in another set. For e.g. asking questions such as if there are enough caps for a given collection of sketch pens, children will place a cap on each pen. Making these correspondence helps to compare two groups of objects. This is pre-requisite for making one to one correspondence between objects and the number words while counting.

Comparison: The intuitive idea of big or small, more or less, long or short develops much earlier than learning how to quantify them. Looking Around and the corresponding teacher page provide many such opportunities. This is the first step to compare and further leads to learning to count and number sense. Comparison helps in ordering of objects based on size. Activities like which box has more chalk piece, which plant has more flowers etc. get children to do one-one correspondence between two sets or two collections. This should be accompanied by introducing vocabulary such as many, more than, less than, same and so on.

Seriation or Ordering: This at earlier stage could happen intuitively just by looking at objects and deciding on how objects could be arranged in increasing or decreasing order by size. The chapters, 'Looking Around' and 'How Long How Heavy', along with the corresponding Teachers Pages include several such experiences. Having the sense of order will help in developing number sense. It helps in ordering numbers. For instance, numbers 5, 6, 7... are in increasing order of magnitude.

Number-rods link the numbers with lengths and can aid in developing this understanding. They can be easily made from long cardboard strips or by colouring pipes or casing (use to conceal electrical wiring). They are 10 rods with lengths increasing from 1 unit to 10 units. The unit length can be anything from 5cm to 10cm. Each rod is divided in to units and coloured alternately as shown in the picture. These also help to understand that any number includes each of the preceding numbers, e.g. the rod for 3 (coloured red-blue-red) include a 2 (red-blue) and a 1 (red). The teacher can choose any two contrasting colours instead of red and blue.



Numbers from One to Nine

(For the chapter 'Meeting Numbers')

Aim of this part is to develop number sense (oral counting, number writing, comparing, splitting numbers, quantity sense, more/less, one more and two more) up to nine.

A child masters counting when s/he:

1. **One-to-One Correspondence:** understands that when saying the names of the numbers in sequence, each object receives one count name
2. **Stable Order:** understands the verbal order of counting; is being able to say the conventional number names in given order
3. **Cardinality:** understands that the last number spoken in a counting order is the quantity representing that set
4. **Order Irrelevance:** understands that the order that items are counted in is irrelevant – left-to-right, right-to-left, or in any random fashion – as long as every object in the set is counted once and only once
5. **Abstraction:** understands that it doesn't not matter what you count, how we count stays the same, e.g., one can count number of claps or how many people stay in his/her home even though those people are not in front of them, imaginary friends or objects, etc.

A child has learnt numbers 1-9 if s/he

1. Can count i.e.
   a. Can speak the number names in correct order
   b. Can answer correctly to 'How many?' for a collection of stable objects
   c. Can pick up correct number of objects from a larger group of objects e.g. picks up 5 pebbles as response to 'give me 5 pebbles' from a pile of say 23 pebbles.
2. Can read and write numerals for the numbers 1-9
   a. Reading e.g. if the child is shown 4 s/he identifies it with "four" and says it aloud
   b. Reading e.g. the child correctly matches 3 with three dots, 8 with eight birds etc.
   c. Writing e.g. if there are 7 oranges in a bucket the child writes "7" to the question "How many oranges?"

There is a *rhyme/song at the end which can be used to introduce the numbers one to twenty.

Introduction of Zero

(For the chapter 'Meeting Numbers')

Zero is associated with "nothing". It is important that children understand the context of nothing as the absence of something or a collection. One way to introduce zero would be to ask questions "How many siblings do you have?", "How many ears do you have?", "How many windows are in this room?" followed by

questions like “How many tails do you have?”, “How many elephants are there in this room?”, “How many buses are in this room?”. The first set of questions will lead to some known numbers. But the second set of questions must have “none” as the response. The teacher can then introduce zero as the number representing “none”. So, the answers should be “I have zero tail”, “There are zero elephant in this room” etc. There is a rhyme/song at the end which can be used to introduce zero. The numeral of zero i.e. 0 can be introduced after this and the similarity with sel roti (one loop) can be pointed out.

Further activities to strengthen and assess the understanding of zero can include the following:

1. Take 5 of a smaller number of chalk pieces on a plate. Let each child remove one and tell how many are left. The child who takes the last piece leaving the plate empty should say “zero”.
2. Let the children stand in a semicircle or a line a bit away from the teacher. Ask them to come 3 steps closer. They take 3 steps towards the teacher. Ask them to take 2 steps back. They move back. Repeat with few non-zero numbers. Ask them to come 0 steps closer. They should not move. Beg them, plead them till they start laughing. The aim of this activity is to assess if children have correctly associated zero with no movement. This is not about position.
3. Modify the above with clap, jump and other physical actions and movement and also with number cards showing 0, 1, 2, 3, 4, 5 instead of saying zero, one, two etc.

Once children have learnt all the numbers 0-9, i.e. they can count any of these numbers and are familiar with the numeral, introduce the ganne mala. Note that, this is a concrete version of the number line, so the counting should always be left to right. Ganne mala helps children see the increasing order of the numbers and the position of each one w.r.t. the others. This will also help children automatically see that 7 = 5 + 2, 8 = 5 + 3 etc.

Understanding Two-Digit Numbers

(For the chapters ‘Meeting More Numbers’ and ‘Meeting Bigger Numbers’)

This is where rules come and children get exposed to place-value. Understanding the meaning of 37 as thirty-seven and also as 3 tens and 7 ones are crucial for everything that follows including addition-subtraction and other operations. Teen numbers do not follow the rule. Here is a suggested sequence which helps children develop strong foundation of place value using what they have already learnt.

Matching Quantities with the Numbers Ten, Eleven … Fourteen: The first step is to count till fourteen. Numerals i.e. 11, 12, 13, 14 and 10 are not introduced yet. Children should be able to count and bring twelve chalk pieces from the chalk box, show where ten is on ganne-mala and clap exactly eleven times etc.

Bundling in Tens: The next important thing is bundling in tens. It is advisable to ask children to count something small like grains of rice or dal. There is higher chance of making mistake unless small bundles/groups are made. The need for bundling will become clearer with bigger numbers. But this is the beginning. Once

children are used to bundling in tens, ganitmala should be introduced. Children should be asked to locate numbers 0-14 on the ganitmala.

This is also a good place to introduce ten-frames. This will also enable children to see fourteen as one full frame or 1 ten and 4.

Numerals of Eleven-Fourteen (i.e. 11-14): This should be done with ganitmala and with bundle and sticks. Children should get the practice of grouping ten sticks together in a bundle. Toothpicks, match sticks (ideally with the heads removed), broom sticks (cut to about 10cm pieces) and used sketch pens are some of the things which can be easily bundled. Ask children to bring thirteen sticks and make bundle of ten. So, there will be 1 bundle and 3 loose sticks.

Make a table and ask children to fill it. If a child asks why tens are on the left, show thirteen on ganitmala and ask where the ten is – left or right.

Tens	Ones

Numeral of Ten (i.e. 10): After some practice with the first 4 teen numbers and their numerals, ask children to get ten sticks and make a bundle of ten. So, there should be 1 bundle and no loose stick. So, ask children how the table should be filled: 1 bundle of ten, so 1 below "Ten". But how many ones? None. Ask how we write "none" and children should be able to say zero and write 0 below "One". Their knowledge of zero is utilized this way.

Playing with Numbers up to twenty (For the chapters mentioned above, and 'Combining and Removing' and 'More Combining and Removing'): As the children learn numbers it is important that they play with them. One possible activity is to take a collection of marbles or bottle caps in different colours, find the count for each colour and order them in increasing/decreasing order, e.g. blue bottle caps are most in number, followed by green ones and white ones are least in number.

Ganne-mala and ganitmala help in recollecting the sequence of number names and their relative positions on the number line. This fosters the understanding of what comes before 7, what comes after 18 and what is between 9 and 11 etc. In addition, these also helps children relate to fact that the bigger number is on the right of the smaller number on the number line.

Addition-subtraction with these numbers (sum not exceeding 20) fosters the number sense further. Ten- frames and ganne-mala help children partition 6, 7 etc. as 5 + 1, 5 + 2 etc. Ten-frames and ganitmala help in grasping the partitions of 10 as 2 + 8, 7 + 3 etc. These partitions aid mental mathematics and help children compute faster.

Numbers up to 99: Numbers from 21 to 99 are easier since their names naturally break into tens and ones e.g. 47 is forty-seven i.e. 4 tens and seven. So, associating twenty with 2 tens, thirty with 3 tens etc. are important. Ganitmala, ten-frames, bundle-sticks are very useful. Children should be asked to count grains of rice or dal to experience the need for bundling. Ten-frames can be used to make the groups of tens.

This is also a good place to introduce the arrow cards. A layout is given at the end. [All of page 1 and one row of page 2 completes a set, so four of page 1 and all of page 2 make four sets.] These will further consolidate sixteen as 10 + 6 and 73 as 70 +

3. They can by directly clipped on the ganitmala. That will help children see sixty-five or 65 as 60 and 5, and as 6 tens and 5 ones.

It is a good idea to have a big bag of sticks (or pebbles). Ask each child put both hands in and take out as many as they can. They ask them to find out how many each one got. They can then bundle in tens (or use ten-frames to group) and identify how many tens they have and how many remain as ones. They can show their numbers on the ganitmala and/or with arrow cards.

Units (small squares) and Longs (strips of 10 such small squares) can be introduced for numbers bigger than 50 to speed up counting.

Engaging with Numbers: To master all these number, children need a lot of practice and opportunities to count various things and play with those numbers. The chapter, 'Watch and Tell', provides many such experiences. Some of these can be counting actual objects, possibly in two different situations, observe where the count is more and what the implication is. Here are some suggested activities:

1. Head count activity: The teacher can begin with conversations and guessing, e.g. "How many children we have in our class today?", "How many are absent today?" Let the children sit in a circle. Ask one child to count one by one by touching head of each child starting with himself/herself. The child should say 1, 2, 3... and so on. Ask another child to show the numbers on the number strip displayed in the class.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

   Make sure the first child counts the second child with the number strip.

   Write "Today ☐ children are present" on the board and ask a third child to write the corresponding number in the given box. Each day different children should take turns to do these. The number strip can be easily made from one or several pieces of stiff card/cardboard. Make each box big enough for the whole class to see and write legible numerals 1, 2, 3... up to the class size.

2. Ask children skip on one leg many times as they can without switching the leg. They have to stop the moment they put the other foot down. They have to count how many times they jumped. They can try with left leg up and then with right one up and see with which leg they had bigger number. In this case, bigger number means better balance and stronger leg. If this done several times, the data can tell if a child's left leg is stronger leg than the right one, or the other way or if both are equally good.

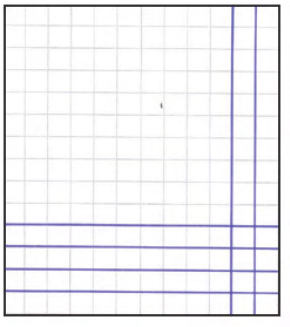
3. A similar activity can be to stand on one leg for say a minute. Here the child can put the other foot down for a moment to regain balance and again fold it up. A partner should count how many times the child had to put his/her foot down. A lower count in this case means better balance.

4. Get children to put a hoop on the ground and count the number of bugs they find within the hoop. They can try to find a place that has the most bugs, and prove they are right by counting the bugs in a hoop location there. Now more bugs, i.e. bigger numbers, mean healthier soil.

New and Bigger Bundle: Hundred

(For the chapter 'Meeting Bigger Numbers')

The next step in learning place-value is understanding that whenever there are 10 bundles, they must be combined to a new and bigger bundle. So, a new and bigger bundle must be made with 10 smaller ones and this new bundle is called hundred. It can be shown on ganitmala and with bundle-sticks. It is a good idea to introduce Flat (a square made with 10 Longs) and show how it takes the same space as 10 Longs.



To make Flats, Longs and Units (FLU), paste sheets of square grid notebooks on any card type material and cut of 10 × 10 squares from one corner. Then cut of longs i.e. 10 × 1 rectangles from the remaining L shape. Finally cut the remaining part into Units.

Since hundred is a new bundle, it has a new place before the ten and a new arrow card.

☞ The teacher can refer to http://www.teachersofindia.org/en/article/atria-pull-out-place-value, http://teachersofindia.org/en/article/atria-pullout-section-july-2013 and http://teachersofindia.org/en/article/pullout-section-november-2013-teaching-subtraction for further activities with numbers.

• MEASUREMENT •

Measurement is essential in everyday life. It involves spatial understanding and counting. In school mathematics, measurement chapters involve mostly standard units and numerical values. However, understanding the basic features in length and weight needs to be developed first. Therefore, this first chapter on measurement focuses on understanding the very basic vocabulary related to length and weight. Capacity and volume are introduced in Class 2 since it is a more complex and can involve multiple lengths.

For this chapter, the teacher needs to introduce the vocabulary first through various contexts and then use the textbook. Please note that at this point getting children learn spellings is not important.

It is important for children to develop vocabulary for comparing objects because comparison helps them understand their environment and their community. It will allow them to identify changes in their environment, which is important for sustainable living.

Length: This involves not just length, but also thickness and distance. This is the most fundamental of all measurements and is crucial for understanding the number line later on.

The key objective is to understand the following:

Words related to comparing two objects	& then	**Words related to comparing more than two objects**
• Longer and shorter		• Longest and shortest
• Thicker and thinner		• Thickest and thinnest
• Nearer and further		• Nearest and furthest

1. To start with the teacher can show two objects (sticks, rods, rope, etc.) which should be different in length. Children can look at it and observe themselves which one is longer and which one shorter. Either way teacher can ask them to take out their pencil keeping them on the table and see which one is shorter and longer.
2. Once children understand "longer" and "shorter", teacher can ask them to find the objects which are shorter than their pencil, or longer than their pencil.
3. To understand conservation of length, the teacher can put two chalks (like shown here) and ask which one is shorter. Children might need some help in aligning them and figuring out that they are actually of the same length. This way "as long as" can be introduced.

4. Then teacher can show three objects (chalk, pipe, ribbon etc.) and ask children to find the longest and the shortest.
5. Once children understand "longest" and "shortest", the teacher can give up to five similar objects and ask children to arrange them longest to shortest (and the other way). This seriation activity is important and foundational for understanding bigger and smaller numbers later on.

Taller-shorter and tallest-shortest can be introduced in a similar way. It is important that teachers explain that we use taller/tallest for things that stand on their own like people, trees, bottles etc. and longer/longest for those who cannot stand on their own like rope, hair, ribbon. Pencil and chalk can be tricky and children should be allowed to figure out what to use for these.

Thicker-thinner and thickest-thinnest can be introduced in a similar way. It is important that children do not form any misconception that thinner will be shortest or thickest will be longest/tallest. So the teacher should have 4 collections of pipes or ropes or ribbons – 3-5 objects in each collection:

1. Of same length but different thicknesses
2. Of different lengths but same thickness
3. Of different lengths and different thicknesses – thicker ones being longer
4. Of different lengths and different thicknesses – thicker ones being shorter

These collections can be made with the help of children with objects from their surroundings. This will enable children to understand that length and thickness are independent of each other.

Once children develop an understanding of these, the teacher can introduce nearer and further. The teacher can pick two children and make them stand at

different distances from the board and ask "Who is nearer to the board?" etc. Similarly, nearest and furthest can be introduced with more than two children.

Measuring length: Before using standard units, let children measure lengths with non-standard units like hand span, arm and feet. Various lengths and distances with the classroom can be measured. It is good to get children to guess first and then measure and check. This can be combined with nearer-further especially when the distances are not along the same line.

Weight: Before children can start measuring weights of objects, they must have some idea of heavy, light, heavier, lighter and so on. Please note, that this experience cannot be provided by visuals and text.

1. Children have to compare things from their surroundings. Two objects can be taken, where one is much heavier than the other, e.g. a bag with books in it and an empty bag, box full of chalks and one with very few. Get them to hold these in their hands and feel which is heavier and which one is lighter. Examples should be from the child's world, where child can relate in easily. Basic vocabulary like **(i)** the bag with the books is heavier and **(ii)** the empty chalk box is lighter should be introduced.
2. It is important that children do not form misconception that bigger objects are always heavier. So
    a. Take two identical bottles. Fill one with water and keep the other one empty. Ask children to guess which would be lighter just being looking. Then let them hold both.
    b. Take two empty (say lotion or shampoo) plastic bottles, one big and the other small. Fill the smaller one with water. Ask children to guess which is heavier by looking. They will guess the bigger one. Then let them hold. Then show them why the smaller one is heavier.
3. Once children understand heavier and lighter by the above activities, then get them to compare the weights of three objects and find the heaviest and the lightest.

☞ The teacher can refer to http://www.teachersofindia.org/en/ebook/pullout-teaching-measurement for further details including principles of measurement and age-appropriate activities.

*Suggestive rhymes/songs to teach numbers:

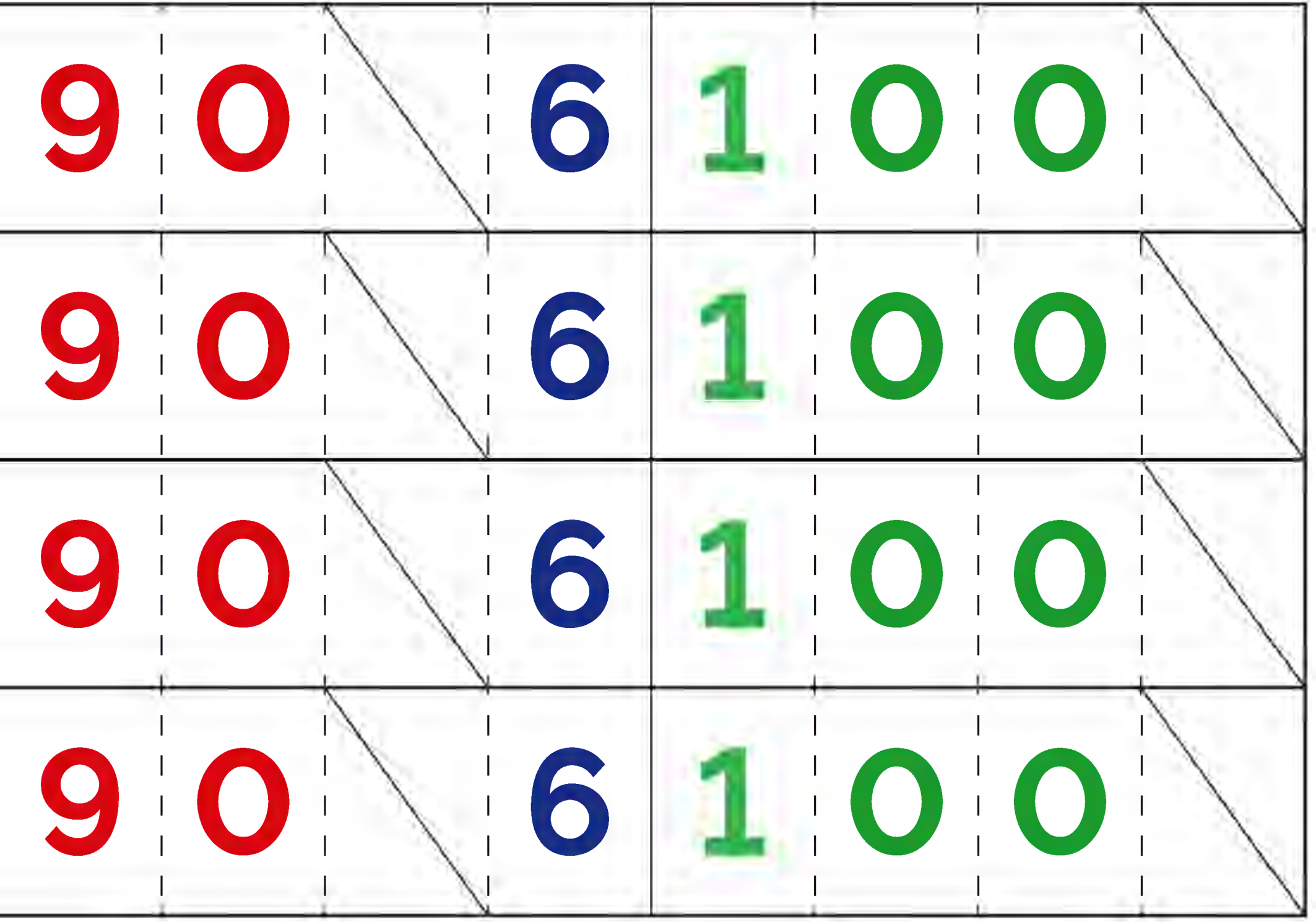
One, Two, Buckle My Shoe
One, two,
Buckle my shoe;
Three, four,
Knock at the door;
Five, six,
Pick up sticks;
Seven, eight,
Lay them straight:
Nine, ten,
A big fat hen;
Eleven, twelve,
Dig and delve;
Thirteen, fourteen, draw the curtain,
Fifteen sixteen, the maid's in the kitchen,
Seventeen, eighteen, she's in waiting,
Nineteen, twenty, my stomach's empty

(Source: https://allnurseryrhymes.com/one-two-buckle-my-shoe/)

5 Little Monkeys Jumping on the Bed
Five little monkeys jumping on the bed,
One fell off and bumped his head.
Mama called the Doctor and the Doctor said,
"No more monkeys jumping on the bed!'
Four little monkeys jumping on the bed,
One fell off and bumped her head.
Papa called the Doctor and the Doctor said,
"No more monkeys jumping on the bed!'
Three little monkeys jumping on the bed,
One fell off and bumped his head.
Mama called the Doctor and the Doctor said,
"No more monkeys jumping on the bed!'
Two little monkeys jumping on the bed,
One fell off and bumped her head.
Papa called the Doctor and the Doctor said,
"No more monkeys jumping on the bed!'
One little monkey jumping on the bed,
He fell off and bumped his head.
Mama called the Doctor and the Doctor said,
"Put those monkeys straight to bed

(Source: https://bilingualkidspot.com/2018/04/23/popular-nursery-rhymes-for-kids-english/)

4	3	2	1
0	0	0	0
5	6	7	8
8	7	6	5
0	0	0	0
1	2	3	4


9 0 6 1 0 0
9 0 6 1 0 0
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