Foundations For Learning

Intermediate Phase
Mathematics
Lesson plans

First term

Grade 4

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Contents

1 Introduction 5

2 Mathematics 7

Counting 7
Mental and Number Sense 9
Problem Solving 10
Group teaching 11
Group work 11
Resources 11

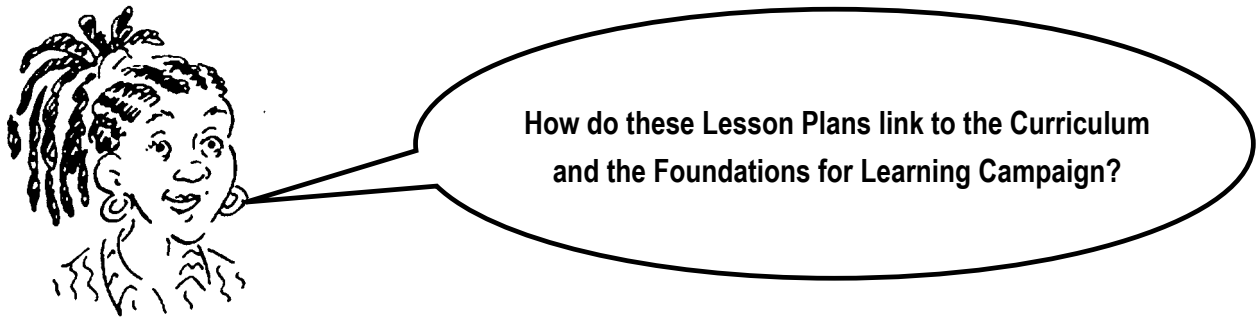
3 First Term 13

Overview of Lesson Plans 13
Overview of Assessment Tasks 14
Lesson plans: 17
Week 1: Overview 17
Week 1: Lesson plans 18
Week 2: Overview 25
Week 2: Lesson plans 26
Week 3: Overview 37
Week 3: Lesson plans 38
Week 4: Overview 49
Week 4: Lesson plans 50
Week 5: Overview 59
Week 5: Lesson plans 60
Week 6: Overview 71
Week 6: Lesson plans 72
Week 7: Overview 83
Week 7: Lesson plans 84
Week 8: Overview 93
Week 8: Lesson plans 94
Week 9: Overview 105
Week 9: Lesson plans 106
Week 10: Overview 113
Week 10: Lesson plans… 114

1. INTRODUCTION

BACKGROUND

The Foundations for Learning Assessment Framework which was distributed to all schools during 2008 contained 'milestones' for each grade. These milestones explain the content embedded in the Learning Outcomes and Assessment Standards, indicating the expected level of achievement of learners at the end of each quarter. This document contains lesson plans based on the milestones.



These lesson plans have been developed using:

- The NCS Learning Outcomes and Assessment Standards as the starting point
- The Milestones and
- Government Gazette 30880 of 14 March 2008, outlining the Foundations for Learning Campaign, which details the minimum expectations for the teaching of Literacy and Numeracy (Languages and Mathematics)

The following **table** provides an example of how these three documents are linked for Grade 4 Mathematics:

Learning Outcomes and Assessment Standards	**Milestones for Mathematics for Grade 4**	**Government Gazette: Daily Teacher Activities during Mathematics time Grades 4 - 6**	**Grade 4 time allocation in Gazette**
LO1 AS1 **LO1 AS4**	- Counting forwards and backwards in a variety of intervals (including 2s, 5s, 10s, 50s and 100s) between 0 and 1 000; - Recognise the place value of digits in whole numbers to a minimum of 3-digit numbers	Oral and mental work	10 minutes
		Review and correct homework from previous day	10 minutes
LO3 AS1; 2; 3	- Recognise, visualize and name 2-D shapes and 3-D objects in the environment - Describe, sort and compare 2-D shapes and 3-D objects from the environment according to their geometric properties	Concept development and problem solving	35 minutes
		Give out homework	5 minutes



How do I use the time allocated for Mathematics?

The Government Gazette No 30880 provides the following breakdown of the formal teaching allocations for Mathematics and Languages in the Intermediate Phase per day:

Grade	Daily total for Mathematics	Daily total for Languages	Total per week for Mathematics	Total per week for Languages
Grade 4, 5 and 6	1 hour	1 hour 30 minutes	5 hours	7 hours 30 minutes

The Gazette further guides teachers by detailing the type of activities that should be contained in the Daily Activities. In the Intermediate Phase for Mathematics these are:

- Oral and mental work
- Concept development
- Problem solving



How, then can these lesson plans help teachers? What do they provide?

These Lesson Plans are intended to assist teachers to pace their teaching, give them guidance when planning their assessment tasks and provide suggestions to enrich teaching practice. They are not intended to be prescriptive and teachers are not expected to abandon good practice in order to blindly follow the plans. The Plans provide:

Very important note:

The lesson plans refer to a variety of resources that are in the Annexures. Most of these resources are items that you have to prepare beforehand. Please read the week overview a day or two before the week's teaching commences, and prepare the resources in advance, so that you are ready when the lesson starts.

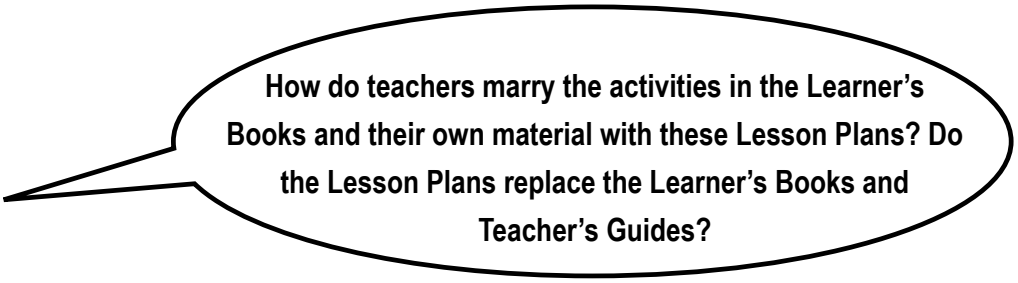
- **An overview of the term** broken into weekly units – compare this with your Work Schedule and ask yourself the following questions: Does your Work Schedule include similar content? Do you reach approximately the same point at the end of each term? The overview provides a useful termly checklist.

- **An overview for each week** – broken down into daily units; this helps you to see the content included in the week's lesson plans, to see how it is paced and to make use of specific lesson

plans. Milestones and Learning Outcomes and Assessment Standards for the week have been included. The latter have been numbered as AS1, 2, 3 etc. No sub-bullets are indicated.

- **Individual lesson plans for each week** for the different components in Languages and Mathematics. The lessons for the week are broken down into daily steps, providing teachers with a breakdown of content and suggestions for implementation. However the plans are not prescriptive and allow you to use your own way of presenting the lesson. They are rich in practical ideas drawn from Best Practice and as such can enrich implementation in the classroom.

- **Suggestions for the Assessment Tasks** for each term for each of the components Remember:



Every class and learner is unique. There is no 'one size fits all'. Learners progress at different speeds and in different ways and you as the class teacher are best able to pace your teaching to the needs of your learners. You can introduce new material in an order that suits you and your learners.

These Lesson plans are not intended to replace the Teacher's Guides and Learner's Books or the material you have developed yourself:

- The Lesson Plans only provide some examples of worksheets for learners and some of the details as to how to present the lessons. You will need to provide further worksheets or activities from your own material or from textbooks.
- There will therefore be similarities between the Teacher's Guides and Learner's Books that you use and these Lesson Plans. However the order of content may be presented somewhat differently so you will need to match the content. These lessons are informed by the sequence of the milestones within the suggested Assessment Tasks per term provided in the Foundations for Learning document.

TEACHING AND LEARNING MATHEMATICS IN A GRADE 4 CLASSROOM

Introduction

" C*onceptual understanding and computational fluency with whole numbers, fractions and decimals form the bedrock of mathematics learning in both early and later years*" (NCTM: Navigating through numbers and operations).

By Grade 4 learners should have begun to develop a sense of how our number system is organised in that we group numbers in values of 10s and 100s.
They should be able to count fluently up to a 1 000 in different number groups (multiples) as specified for Grade 3, to build and break down numbers in different ways in order to compare number values, order them and do calculations involving all four operations, including division. They have begun to explore the meaning and relationships between the different operations.

This is the foundation we assume that further learning can take place in Grade 4, allowing learners to extend their place value understanding to investigate bigger numbers and to work more with irrational numbers, including common fractions and decimal fractions; (in the context of measurement.)

We need to give greater emphasis in Grade 4 to multiplication and division of bigger numbers and help learners to be able to use the properties of numbers to do related calculations; for example how to use the distributive property when multiplying
34 x 23 for example, by breaking down the calculation into (34 x 20) + (34 x 3) to make the task more manageable.

We also need to expose learners to a wider range of different problem solving situations where these operations are used. At the same time it is important to further develop learners' computational fluency by extending the number range they are able to count in and practice their mental calculation skills.

It is important to remember that learners in Grade 4 are not yet expected to use formal algorithms like column addition or subtraction and should still be encouraged to develop their own strategies for doing different calculations. There is a tendency to impose methods standard methods on learners too early which does not support their natural developmental inclination towards making sense of numbers and number relationships in their own way.

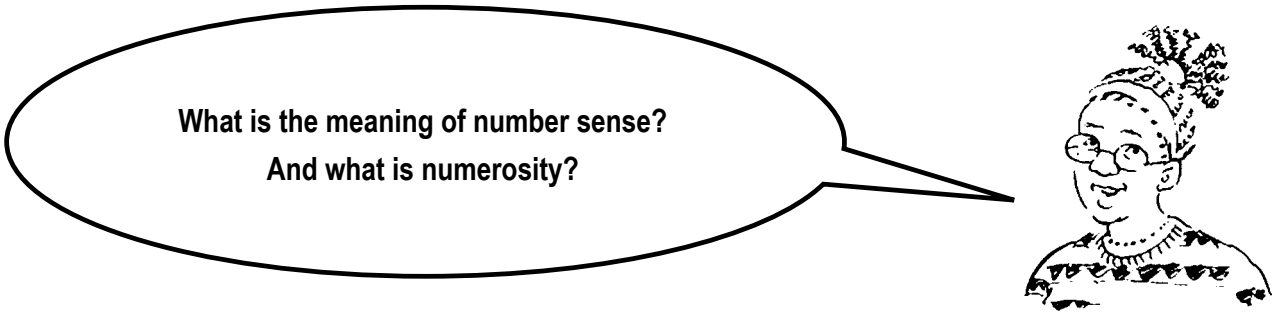
Many learners at this level for example, may still find it helpful for example to use drawings or diagrams to represent their thinking in relation to situations of sharing or grouping (multiplication and division) This should not be discouraged. Remember that a learner in Grade 4 is in transition from relying on concrete thinking and representations to being able to function more abstractedly. So to rush him/her would not allow the development of moving from one mode to another to takes it natural course.

Another key principle to consider is that learners learn a great deal from one another. So when giving them the chance to come up with their own ways to calculate or solve a measurement problem for example, it is important that make space in your lesson for learners to share and communicate their thinking with the rest of the class.

A further important change is that in many classes, learners in Grade 4 are moving into English as a medium of instruction which in many cases is not their home language. It is impossible to conduct

a maths class for such learners entirely in English and expect them to communicate their thinking in a language they are not yet fluent in. One should still allow the space for learners to express themselves freely in their own language and then mediate the "mathematical conversations" in ways that every learner understands. This is very challenging, but simply ignoring the issue will only stifle your learners' mathematical development and leave them frustrated, where they may for example well understand a concept or process well, but not yet have the tools to express themselves clearly in English.

MENTAL AND NUMBER SENSE ACTIVITIES



Many teachers are in a hurry for their learners to know facts off by heart. However, knowing facts off by heart is no indication that the learner understands what they are doing or that they will be able to use these facts in different contexts. It is much, much more important that you design activities which will help your learners develop a sense of number because it is this sense of number that learners use when trying to build up an understanding of computational strategies. You cannot teach number sense; you can only help learners acquire it by exposing them to various activities which allow learners to construct knowledge for themselves. Encouraging learners to reflect on what they are doing and then talk about it is helping these learners to develop a sense of number.

You will find learners at different levels of readiness in your class. Your programme should meet the needs of all the learners i.e. learners who are ready to move on should not be kept at the same level as learners who are still developing these essential skills.

Different kinds of knowledge (physical, social and logico-mathematical) play a role in developing learners' number sense and knowledge:

- *Physical* knowledge is the knowledge that the learner acquires from relating mathematical situations to physical models or representations; (this is more important at the Foundation Phase level, although some learners in Grade 4 are still reliant on using counters for example to represent numbers).
- *Social* knowledge can only be learnt by telling. So for examples naming numbers as decimals or fractions or using particular symbols to represent mathematical relationships is social knowledge that a learner needs to be told and cannot find out for himself/herself.
- *Logico-mathematical* knowledge refers to the type of knowledge that learners construct for themselves e.g. noticing the pattern in the place value system; or finding out that to subtract 456 – 345 they can add on from 345 to 456 to find the solution is something a learners can find out for themselves as their number sense develops over time.

Your role as a teacher rather is to support your learners' development by providing appropriate activities that enable them to pass from one level of number level to the next where they integrate the different kinds of knowledge to solve particular problems or do calculations with number.

PROBLEM SOLVING



Do I have to teach my learners to solve problems?

There are many different ideas as to what problem solving is and its value for young learners. However, one of the focal points of the Mathematics Learning Area is that learners be exposed to problems on a regular basis..

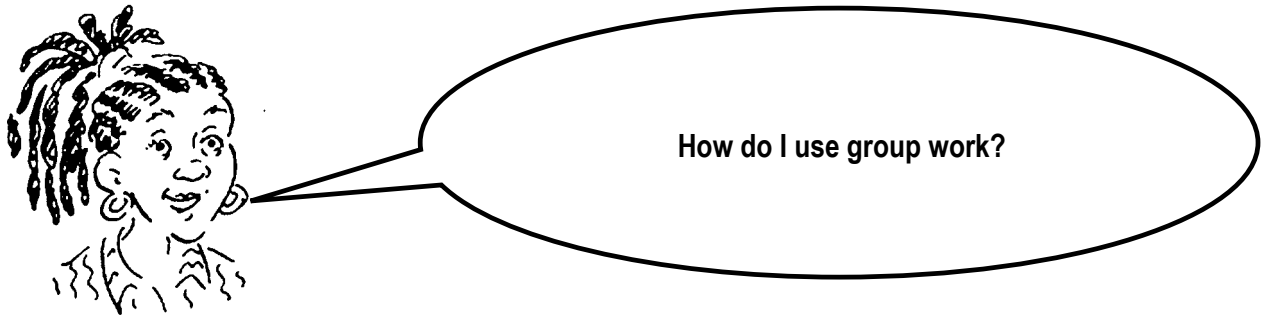
By placing information in context, problem solving becomes a powerful activity and is one of the main vehicles for developing number sense. Therefore you need to constantly challenge learners with realistic, real-life problems without first teaching prerequisite tools or operations. In order to fulfill the purpose of word problems, learners should regularly be given problems which are new to them and for which they do not possess routine methods of finding the answer.



How do I give my learners sufficient practice in problem solving?

The objective of giving word problems is to provide your learners with opportunities to make sense of mathematics, to put their own ideas and initiative into practice, to develop new knowledge, take note of how others solve the problem and to reflect on their own thinking. The practice of only presenting real-life problems after a set of skills and knowledge where only numbers are used is developed, should not to be encouraged. Rather problems themselves are the vehicle for helping learners to see the relevance of why we need to manipulate numbers in particular ways, so that we are able to solve problems that have meaning in our lives. Exposing learners to a variety of problems enables them to develop their ability to interpret problems, and this helps to give meaning to the concept of the operations.

GROUP TEACHING OR GROUP WORK



Although learners can learn much by working in groups, working in groups may also be detrimental to learning. When implemented in the wrong way, having learners woirk in groups may result in many learners being idele and nort learning much. The best way to prevent this from happening, is to precede group work with individual work on the same task, to ensure that each learners engages with the task personally and has own ideas about it before starting to work with others. The main value of group work is that it provides learners with opportunities to express their own ideas. Having to tell others how you thought to do something, for example to solve a problem, forces the learner to clarify his/her own thoughts. In the process of doing so, learners ideas often develop further.

RESOURCES

The Government Gazette No 30880 provides a list of recommended resources for Mathematics which schools should endeavour to provide. In addition to exercise books, Learner's Books, Workbooks and basic stationery which most schools already have, refer to the list of suggested equipment for the Intermediate Phase, that we believe re essential to have available to conduct your teaching and learning programme successfully.



Very important note:
The lesson plans refer to a variety of resources that are in the Annexures. Most of these resources are items that you have to prepare beforehand. Please read the week overview a day or two before the week's teaching commences, and prepare the resources in advance, so that you need not run around when the lesson commences.

FIRST TERM OVERVIEW OF LESSON PLANS

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Oral and mental work	Count collections of objects up to 1000							Count with fractions	Counting in different intervals	
		Addition of single digit numbers		Addition of multiples of 10 and 100		Addition of multiples of 10 and 100				Addition and subtraction
						Multiplication facts			Multiplication facts	

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Conceptual development and problem solving	Express numbers and quantities in words, in expanded notation and with tally table									
		Express numbers with flard cards								
			Express numbers in positional notation							
			Problems that involve addition	Problems that involve subtraction	Equal sharing problems		Money problems that involve addition and subtraction	Problems in the context of measurement.	Problems that involve multiplication, grouping and sharing	
					Measure length			Measure length.		
				Fractions as parts and as units of measurement. Decimal notation for tenths.				Fractions in the context of measurement		
				Extend number patterns		Extend number patterns				Extend and design number patterns
		Make and analyse 3-dimensioanl objects				Polygons. Geometric patterns in nature				Properties of polygons
							Data collection, representation and analysis			

FIRST TERM ASSESSMENT OVERVIEW

Important note: The primary value and purpose of assessment is to gather sound information on what knowledge they have and how they think, to inform you as their teacher, so that you can focus your teaching on providing opportunities for your learners' knowledge and thinking to develop further and become more sophisticated than what it was when you assessed it**.**

	Milestones for Assessment Task	Suggested activities for Assessment
Week 1	• Count given unstructured collections of objects (pictures and marks) up to 300 by structuring (grouping into tens and hundreds.	**Days 2 , 3 and 4:** Informal assessment of counting..
Week 2	• Mentally add and subtract single-digit numbers. • Count out collections of a given number of objects.	**Day 1:** Activity 2: Observe how learners add small quantities. **Days 3 and 5**: Learners represent numbers with tally sheets.
Week 3	• Solve problems by addition. • Solve problems by subtraction. • Write numbers up to 1 000 in condensed positional notation. • Write number names in words, and in expanded notation. • Recognises, identifies and names two-dimensional shapes.	**Day 2:** Activity 2: Worksheet with problems (Annexure I). **Day 4:** Activity 2: Formal assessment with a written task (Annexure J). **Day 5**: Activity 3: Written task on faces of prism and pyramid.
Week 4	• Solve problems by addition. • Solve problems by subtraction. • Solve problems that involve more than one operation. • Write numbers up to 1 000 in condensed positional notation. • Write number names in words, and in expanded notation.	**Day 1:** Activity 2 and **Day 2**: Activity 1: Observe the level of sophistication of learners' work on given problems, and possible progress in this regard. **Day 4**: Formal assessment task (annexure N).
Week 5	• Solve problems involving measurement, involving fractions including halves, thirds, quarters, fifths, eighths and tenths and mixed numbers involving these fractions, expressed in words.	**Day 4:** Take in classwork books to assess work done in class during Activity 1.
Week 6	• Investigate and extend number patterns looking for general rules or a relationship, including patterns. • Count in a variety of intervals (including 2s, 3s, 5s, 10s, 25s, 50s and 100s), starting from any number between 0 and 1000.	**Day 1:** Take in learners' descriptions of patterns they have investigated, and read it carefully to assess their understanding of the patterns as well as their writing ability. **Day 5**: Activity 2: take in the written work for formal assessment of understanding of the patterns as well as of interval counting and addition and subtraction skills.

Week 8	• Uses the appropriate SI unit to estimate, measure, record and compare lengths. • Solves problems involving selecting, calculating with and converting between appropriate SI units: Millimetres↔centimetres Centimetres↔ metres Metres↔ kilometers. • Use appropriate measuring instruments to appropriate levels of precision including rulers, metre sticks, tape measures and trundle wheels to measure length. • Investigates and approximates (alone and/or as a member of a group or team): perimeter using rulers, metre sticks, tape measures and trundle wheels.	**Day 2:** Written activity. **Day 3**: Learners' work on problems taken in for assessment. .
Week 9	• Solve problems that involve repeated addition. • Solve problems that involve grouping and sharing..	**Days 2 to 4:** Observe the level of sophistication of learners' work on given problems, and possible progress in this regard .
Week 10	- Recognises, identifies and names two-dimensional shapes including circles, polygons (triangles, quadrilaterals (squares, rectangles, rhombus, trapezium, kites), pentagons, hexagons, heptagon, octagon) in terms of the number of sides up to 8-sided figures. • Draws, sorts and compares physical two-dimensional shapes (listed above) according to geometrical properties including number of sides, straight and curved sides • Recognises and describes natural and cultural two-dimensional shapes, and patterns in terms of geometric properties.	**Day 2:** Formal assessment.

FIRST TERM: WEEK 1 OVERVIEW

One of the major causes of poor performance in numeracy is that learners often spend very little time on numeracy tasks. Teachers should do their utmost to use learners' time effectively, by keeping them busy on meaningful and challenging tasks all the time. These lesson plans have been carefully designed to support you to achieve that. **But, for the lesson plans to work, you need to prepare your resources, as specified in each lesson, in advance (at least the day before).**

Hours: 5				**Number of periods: 5**	
Learning Outcomes and Assessment Standards LO 1 AS 1, LO 5 AS 1			**Milestones:** • Count in tens. • Counting given unstructured collections of objects (pictures and marks) up to 300 by structuring (grouping into tens and hundreds). • Counting out collections of a given number of objects up to 500, by forming structured collections with actual objects and/or making marks. • Using tallies.		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Fous	Cut flard cards	Tally marks and counting, using tally marks	Counting objects by grouping into tens and hundreds	Counting and making grouped collections of objects	Cut number bond cards
Resources	Copies of Annexure D (two flard card sheets). A4 paper for each learner. A pair of scissors for each learner.	Two blank A4 sheets for each learner.	A collection of more than 200 counting objects for each learner, in a suitable container.	Worksheet; A copy of a cutout envelope	Copies of Annexure D (the 13 sheets of number bond cards). A pair of scissors for each learner. A4 paper for learners. Suitable containers for bond cards.

Note: Many pairs of scissors are needed. Plan together with your Grade 4 and 5 colleagues. The lessons for the week may actually be done in any order.

WEEK 1: DAY 1

Notes to the teacher:

- Utilise the first week to set up the resources you will need, with the help of the learners in your class. Suggestions for resources are given in the lesson plans for week 1.
- The most critical of the resources mentioned here is a set of **flard cards for each learner. Make sure that you manage to produce these during the first three days of the school year**, so that each learner has a personal set of flard cards, in an envelope, from the second week onwards.
- Each learner will need their own set of flard cards to work with, to support their development of number concept throughout the year. Let learners cut out their flard cards from the copies that you provide. They can then make , and let them make envelopes from the copies you have made.A4 sheets in which to store the cards. Let some learners make two sets of flard cards, so that you have spare sets available for learners who may join school late, and to replace sets that may get lost.

Resources:

- Ask learners to each bring the following items to school the next day:
  - An empty box, e.g. a corn flakes or other cereal box. Learners who can do so, should bring two boxes.
  - A plastic bottle with a cap or a tin with a lid, for keeping a collection of counters.
  - More than two hundred small similar objects that can be counted, for example pebbles or beans or beads or mealie pips or small stones or short sticks or sunflower or other seeds.
  - A plastic bag (like those used in shops) or a larger box, in which the above can be kept.
- Note that these materials will be needed for lesson 3.
- Copies of the two flard card sheets (Annexure B) for each learner, and second copies for half of the learners. You may make the copies on ordinary paper, but it will be much better if you can make it on thick (heavy) paper or thin cardboard.
- As many pairs of scissors as you can make available.
- You need to cut out one full set of flard cards (Annexure B) before the lesson, so that you can easily show learners what their cards will look like once they have cut them out.
- One A4 sheet per learner, for making an envelope.
- Sets of counting cards with combinations of multiples of ten, like Annexure A in the Annexure File, for half of the learners.

If you have scissors for at least half of the learners in your class and have printed the flard card sheets for lesson 1, do lesson 1 today. Otherwise do lesson 2 today.

ACTIVITIES FOR THE DAY

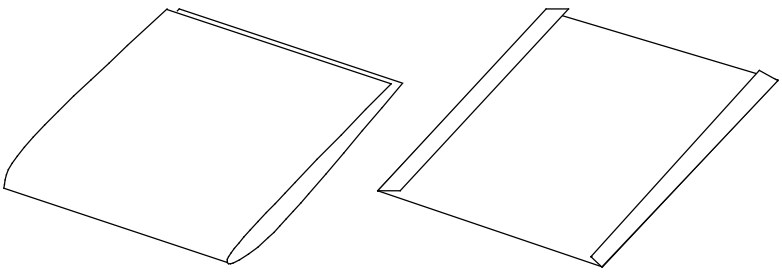
PRACTICAL

Inform learners that they will need cards to help them to learn to understand numbers better.

Hand out the two flard card sheets to each learner. Demonstrate to learners how they should cut each flard card sheet along the dotted lines, by cutting one sheet while they observe. If you have many learners in your class, you may have to do several demonstrations in different parts of the class.

If there are not enough scissors, some can start by making makeshift envelopes by folding A4 sheets as shown below:

A second fold on each side will make the envelope a bit sturdier. Learners will soon (in a later lesson) learn to make better envelopes, using scissors.



Step 1 Step 2

Learners who are still without scissors may also do the counting cards (Annexure A), writing the answers on loose sheets that you provide or in their classwork books if they already have these to work in.

Let learners who finish quickly cut a second set of flard cards, so that you have spares, and sets for learners who may join school a few days late.

ORAL AND MENTAL ACTIVITY

Use the last fifteen minutes of the lesson to let learners (the whole class together) count in tens as far as they can, but up to at least 200.

ten, twenty, thirty, forty, fifty, ...

WEEK 1: DAY 2

Notes to the teacher:

- Tally marks are used as a context to practice counting and promote number concept.

Resources:

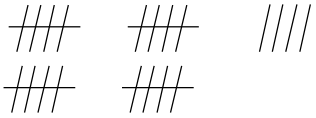
- Two blank A4 sheets for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Explain and demonstrate to learners how to use tally marks to keep a record when counting. For example, you may ask each learner in the class to stand up in turn, and make a tally mark for each learner on the board while they do this. When you have recorded all the learners in the class, count the tally marks aloud so that learners can observe you counting in tens and then in ones.



Activity 2

Tell the class you will tap on the table a large number of times, and that they must make a tally mark for each tap. Give about one tap every second, using a suitable hard object so that all learners in the class can clearly hear each tap. Do about 40 taps.

Go round the class to check whether learners are making the tally marks correctly, with each fifth tally mark drawn horizontally across the previous four. Suggest to learners that they make their tally marks by putting two groups of five close to each other as you have demonstrated on the board, so that they can easily count them by counting in tens later.

Activity 3

Tell learners you will start "tapping" again. This time make 100 and 200 taps in total. Count your taps so that you know how many you've made. Let learners count their tally marks and compare their answers. **Learners should not write their answers at this stage.** Tell them how many taps you did, and ask each learner to determine how far she/he was from the correct answer. Encourage them to perform better the next time.

Activity 4

Tell learners they should now make their tally marks on a new page in their classwork book, or on the back of the loose sheets they have used for activities 2 and 3. Tell them that this time you will make between 300 and 400 taps. Repeat activity 3, but now give between 300 and 400 taps.

Activity 5

Use the last ten minutes of the lesson to allow learners (the whole class together) to count in tens as far as they can, but at least up to three hundred.

WEEK 1: DAY 3

Notes to the teacher:

- This lesson is about learning to count collections of objects by arranging the objects in groups of ten and hundred. The value for learners is not only refinement of their counting skills, but also the development of their understanding of the base ten structure of our number system, and hence an understanding of place value. These understandings are critically important to enable learners to make sense of and understand methods of computation.

Resources:

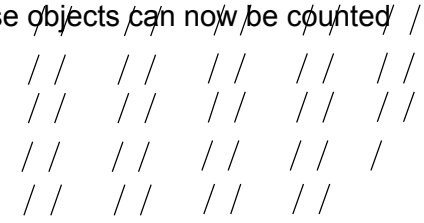
- A collection of more than 200 counting objects (e.g. beans or pebbles or beads or seeds) for each learner, in a suitable container. These are the counting objects which you asked them to bring on the first day.

ACTIVITIES FOR THE DAY

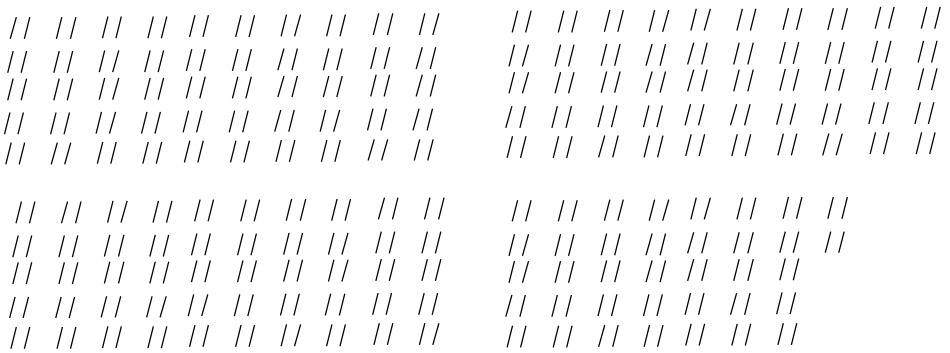
ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1:

Let each learner access her/his set of counting objects, and tell them that they will now count them. Explain, by demonstrating on the blackboard, how they can arrange the objects in groups of ten to make them easy to count. Once arranged like this, these objects can now be counted by first counting in tens: *ten, twenty, thirty, forty,* then continuing in ones: *forty-one, forty-two, forty-three, up to, forty-seven.*



Explain and demonstrate to learners that they can also put ten groups of ten close to each other to form a hundred, so that larger collections of objects will be even easier to count:



Activity 2:

Each learner now has to pack out the counting objects in groups of 10 and 100 in the same way that you have demonstrated. Move around the class and ask learners who have finished to tell you how many counters they have packed out, by stating the number of groups of hundred, the number of extra groups of 10 and the number of loose counters. For example, they may say *three hundred and seventy six* or *three hundred and seventy four* for the above example. Let each learner who finishes exchange her/his counters with another learner who has finished, so that they can have more experience of counting objects by arranging them in tens and hundreds.

Ask learners to each bring another empty box, e.g. a corn flakes or other cereal box, to school on the next day. (You will need the boxes for several purposes in later lessons.)

Use the last 5 minutes of the period to let learners count in hundreds as far as they can.

WEEK 1: DAY 4

Notes to the teacher:

- In this lesson you will provide learners with further opportunities to develop their counting skills and number concept.
- Learners will once more use tally marks to keep a record while counting, and also count given tally marks.
- Only let learners express numbers in the conventional condensed notation, e.g. 300+79+5 as 375 in later lessons (week 3). If this notation is required too early, there is a huge danger that many learners will use it without understanding what it really means, i.e. without understanding the real place values of the separate digits.

Resources:

- A copy of the worksheet on the next page for each learner. Alternatively, you can write the next page on the board, and have learners copy it onto blank sheets that you give them.
- A copy of a cutout envelope (Annexure C) for each learner. Please make an envelope yourself before the lesson so that you know how to demonstrate it to learners.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Give each learner a copy of the worksheet on the next page. Tell them that it is a record kept by a shopkeeper of customers coming into his shop each day during a certain week.

They must count the tally marks for each day. They must write the number of customers for each day in expanded notation and in words, like they did in the previous lesson.

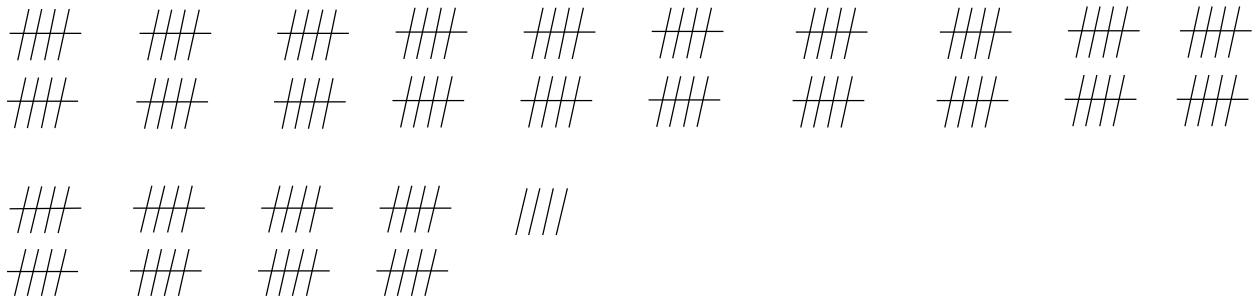
Circulate between the learners to monitor their progress. Encourage them to count in tens if they are not doing this anyway. Their written work should look like this:

Monday:	100 + 40 + 4	one hundred and forty-four
Tuesday:	100 + 6	one hundred and six
Wednesday:	80 + 5	eighty-five
Thursday:	50 + 3	fifty-three
Friday:	100 + 80 + 8	one hundred and eighty-eight

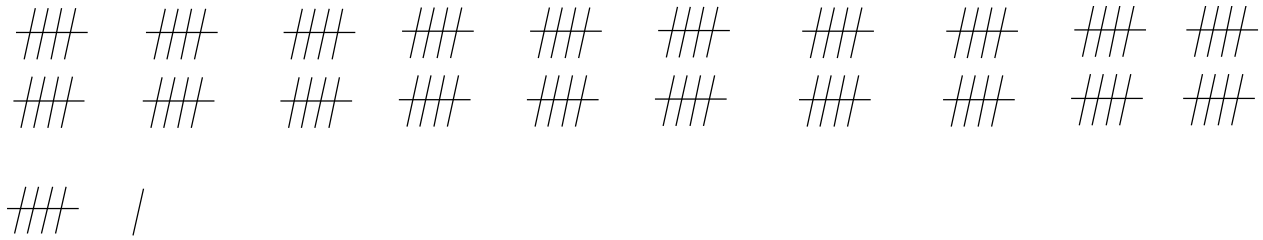
(In a later lesson, learners will revisit this work in their classwork books, to determine the total number of customers for the week.)

Some learners may finish quite quickly. Give them copies of the cutout envelope and scissors, and ask them to cut and fold these to make envelopes.

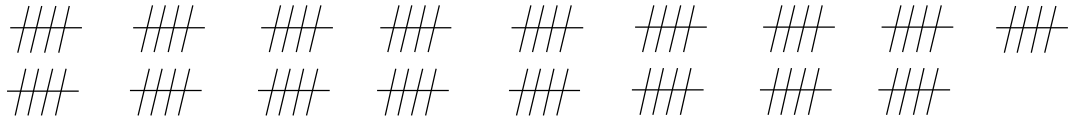
Monday



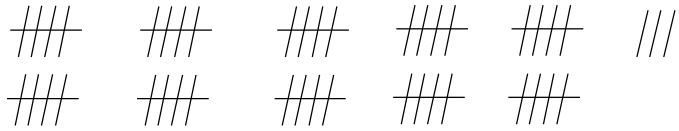
Tuesday



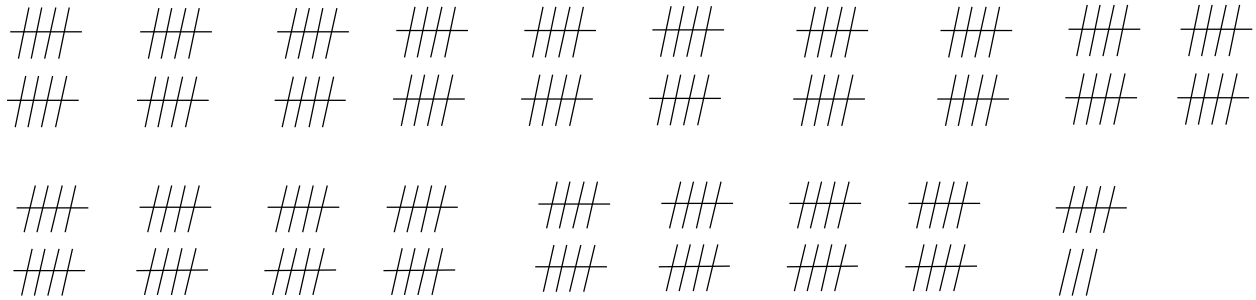
Wednesday



Thursday



Friday



CONSOLIDATION

Ask each learner to choose a number between 200 and 300, and another number between 300 and 500, and to write each number in words, and in expanded notation, in their classwork books.

Give each learner a blank A4 sheet of paper. For homework they have to draw tally marks, neatly, on the sheet of paper, to represent one of the numbers they have chosen. Then, on the other side of the sheet, they have to represent the other number they have chosen with tally marks. They may start doing this while still in class. (You will take these sheets in during the next lesson. This will now be a resource for providing counting practice opportunities to learners.)

WEEK 1: DAY 5

Notes to the teacher:

- If you have a pair of scissors for each learner, all learners will cut bond cards (Annexure D). You need at least one set of bond cards for every four learners in your class (so they can practice bonds in groups), but preferably a set of bond cards for each learner.
- If you do not have enough pairs of scissors, some learners will make tally charts for numbers between 400 and 600.

Resources:

- Copies of the 13 sheets of bond cards (Annexure D).
- Scissors.
- Clean A4 sheets on which learners will make tally charts.
- For each set of bond cards that will be cut, you need a suitable container, e.g. the bottom part of a cereal box.

ACTIVITIES FOR THE DAY

PRACTICAL

Arrange learners in groups of four or three.

Give each group with scissors one set of bond card sheets and a container. They have to cut out the cards and put them in the container. Collect the containers with card sets and store them in a safe place.

In groups without scissors, or in groups that have finished cutting the bond cards, each learner should choose a different number between 400 and 600, and make a neat tally chart to represent that number. You will take these in, to use as a Annexure in later lessons.

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Use the last ten minutes of the lesson to let learners (the whole class together) count in tens as far as they can, but at least up to three hundred as follows:

ten, twenty, thirty, forty, fifty, ...

FIRST TERM: WEEK 2 OVERVIEW

Hours: 5					**Number of periods: 5**
Learning Outcomes and Assessment Standards LO 1 AS 1, AS 3, AS 4; AS 5, AS 8 LO 3 AS 1			**Milestones:** • Mentally add and subtract single-digit numbers • Counting given structured collections of objects up to 1000, recording the result by writing the number name in words, by showing it with Flard cards and by writing it in expanded notation • Investigates and compares (alone and/or as a member of a group or team) three-dimensional objects by making three-dimensional models (rectangular prisms)		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Development of skill in reading text involving prose as well as diagrams and quantitative information. Practice mental addition of single digit numbers.	Learning to display numbers with flard cards and record numbers in expanded notation.	Counting grouped collections of objects, displaying each total with flard cards and writing it in expanded notation.	Make paper boxes (rectangular prisms) THIS LESSON CAN BE ON ANY DAY OF THIS WEEK. Different classes may do the lesson on different days if the schools only have enough scissors for one class.	Counting grouped collections of objects, displaying each total with flard cards and writing these in expanded notation.
Resources	A copy of Annexure A (Tray and Rack sheets) for each learner.	At least four different counting worksheets, (Annexure E) for each learner. Flard cards (each learner should have a set). Tally mark sheets (from the Week 1 Day 5 lesson).	At least four different counting worksheets, (e.g. Annexure E) for each learner. Flard cards.	Scissors, preferably a pair of scissors for each learner. Two copies of Annexure G for each learner	Annexures E and F, as prepared for previous lessons. Flard cards. Scissors, sheets of A4 paper, and empty boxes (e.g. cereal boxes). Copies of neat tally mark sheets.

WEEK 2: DAY 1

Notes to the teacher:

- This lesson provides learners with opportunities to develop basic counting, writing and reading skills.

Resources:

- A copy of Annexure A (Tray and Rack sheets) for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Hand out copies of the sheet named *Trays A*.

Task 1

Ask learners to find out how many apples there are in each tray. Demonstrate on the board how they should write their answers in their classwork books, for example:

There are 8 apples in tray 11.

Tell learners to write their answers by starting at Tray 1, then Tray 2 and so on up to Tray 16.

The answers are as follows:

Tray 1:	7 apples	Tray 2:	8 apples
Tray 3:	8 apples	Tray 4:	7 apples
Tray 5:	6 apples	Tray 6:	10 apples
Tray 7:	8 apples	Tray 8:	9 apples
Tray 9:	5 apples	Tray 10:	7 apples
Tray 11:	5 apples	Tray 12:	4 apples
Tray 13:	9 apples	Tray 14:	6 apples
Tray 15:	5 apples	Tray 16:	3 apples

While learners do this you may write Task 2 (see next page) on the board. (You could also make copies of these questions to hand out.)

Task 2

How many apples are there in each of the following two trays together?

1. Trays 3 and 5
2. Trays 4 and 10
3. Trays 2 and 12
4. Trays 8 and 14
5. Trays 16 and 15
6. Trays 13 and 11
7. Trays 9 and 10
8. Trays 6 and 12
9. Trays 1 and 7
10. Trays 2 and 11

Add ten more questions of your own.

Circulate between the desks while students work on Task 1. Learners who finish with Task 1 should start working on Task 2. Make sure learners understand the question correctly (the answer to question 1 is 14 apples).

Circulate between the desks, observe how learners find their answers, and make notes on a list of the learners' names. Use this as an opportunity to make an **assessment** of learners' basic addition skills. For each learner, note which of the following methods the learner uses:

- Produce the answers mentally by looking at the answers to Activity 1 (i.e. not looking at the printed *Trays A* sheet), without making any marks or counting on their fingers.
- Produce the answers by looking at the answers to Activity 1 (i.e. not looking at the printed *Trays A* sheet), and by making marks or counting on their fingers.
- Consult the *Trays A* sheet, and count the apples in the two trays.

Activity 2:

Hand out copies of the sheet named *Trays B*. Now do exactly the same as in Activity 1. Answers must be written in learners' classwork books, orderly arranged from Tray 1 to Tray 15.

Give Activity 3 for homework, even if learners have not completed activities 1 and 2.

Activity 3:

Hand out sheets *Rack A* and *Rack B* and let learners do the questions. Make sure learners understand the three questions on each sheet.

ASSESSMENT	**Informal Assessment:** Activity 2

WEEK 2: DAY 2

Notes to the teacher:

- This is a critical lesson, where you will ensure that learners can display numbers (results of counting) correctly with flard cards, in expanded notation and writing in words.
- Learners will only express numbers in the conventional condensed notation, e.g. 300+79+5 as 375, in later lessons. If this notation is required too early, there is a huge danger that many learners will use it without understanding what it really means, i.e. without understanding the real place values of the separate digits.

Resources:

- At least four different counting worksheets, with pictures of objects arranged in groups of ten and hundred (like those in Annexure E) for each learner.
- The tally mark sheets that learners made in Week 1 Day 5 lesson. Select the correct and neatest ones.
- Each learner now has a set of 27 flard cards, of one-digit numbers, multiples of 10 and multiples of 100.
- Each learner must have a classwork book and a pencil.
- Worksheets with questions 1 to 9, or similar questions. If English is a second language for your learners, it may be best to translate the questions into their first language before you make copies.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Each learner should access her/his flard cards. Ask them to put all the hundreds cards in one pile, the tens cards in another pile and the one-digit cards in a separate pile.

Set the following tasks verbally to the whole class, one by one. Learners should do the questions individually, then compare and discuss their card displays with others.

1. Find a card that shows *four hundred*.
2. Find a card that shows *eighty*.
3. Find two cards that together show *three hundred and sixty*.
4. Find two cards that together show *three hundred and six*.
5. Find three cards that together show *three hundred and seventy-six*.
6. Find three cards that together show *seven hundred and thirty-six*.
7. Find cards that together show *six hundred and thirty-seven*.
8. Find cards that together show *six hundred and seven*.
9. Find cards that together show *six hundred and fifty-seven*.

Give each learner one counting worksheet. Distribute the four different counting worksheets, so that learners seated close to each other have different worksheets.

Tell learners that you now want them to:

- find out how many apples are shown on the worksheet;
- show the number of apples using their flard cards;
- write the numbers on their flard cards separately in their classroom books, showing with '+' signs that they belong together;
- write the total number **in words** in their books.

For example, if there are two hundred and sixty-eight apples on a sheet, learners should show the cards 200, 60 and 8 and write the numbers 200, 60 and 8 in their classroom books, with '=' signs, i.e. 200 + 60 + 8 (expanded notation), as well as two hundred and sixty-eight.

Important note: Learners need not write the numbers in condensed notation, e.g. 268; at this stage (they will do so in Week 3). When they try to do this, some may write 200608 instead of 268. It is in fact not a mistake, since this learner is simply expressing her/his understanding of the number, which is 200+60+8. You will introduce the condensed notation using flard cards in Week 3 Lesson 3.

After you have handed out the counting sheets (like those in Annexure E) and explained the task to learners, you should move around between the desks to observe what learners do and to provide some help to learners where needed.

Do not assume that all learners will be able to count the apples using multiples (group counting) Look out for those learners who are not able to do this. These will be those learners who still count the apples one by one. Suggest to them that they try and count in tens instead.

The correct answers for Annexure E are as follows:

For sheet A:	200			200	*two hundred*
For sheet B:	100	20	6	100 + 20 + 6	*one hundred and twenty-six*
For sheet C:	100	10	6	100 + 10 + 6	*one hundred and sixteen*
For sheet D:	100	20		100 + 20	*one hundred and twenty*

Some learners may finish with all four counting tasks with more than 30 minutes of the lesson left. Give these learners the following tasks to work on, individually. You may set the grouping and the sharing questions at the same time, so that learners can choose which one to work on first. Request learners to do their work in writing on loose sheets, and collect these sheets at the end of the session, so that you can look at what they have done in your own time. **(Please make time to actually do this: you may find their work very interesting.)**

1. One chair costs R87 each at a shop. How many chairs can you buy with R500?
2. 500 apples have to be shared between 87 people. How many apples can each person get?

Learners who finish with sheets A to D, but are have not time left to work on the above problems, can be given tally sheets, with the instruction to count the tallies and represent the answers with flard cards, in expanded notation and in words just as they have done for sheets A to D.

ORAL, MENTAL AND CONCEPT DEVELOPMENT	
Use the last ten minutes of the lesson to let learners (the whole class together) count in tens as far as they can from a non–multiple of 10 or 100. For example 201; 211; 221; 231 …	
ASSESSMENT	**Informal Assessment.**

WEEK 2: DAY 3

Notes to the teacher:
- This is a repeat of the lesson of the previous day, with different counting worksheets, e.g. Annexure F.

Resources:
- At least four different counting worksheets, with pictures of objects arranged in groups of ten and hundred, like those in Annexure F, for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Give each learner one of the counting worksheets: E, F, G or H, but keep Sheet I for the second half of the lesson. Distribute the four different counting worksheets, so that learners seated close to each other have different worksheets.

Put the following question to learners:
How many apples are there in each of the boxes?
Do not take an answer from any learner. Ask learners to discuss the question among themselves. Then put this question to them:
How many boxes are there on one shelf (rack)?
Allow learners to discuss this for 3 to 4 minutes, then tell them that they must now work individually to find out how many apples are shown on the worksheet. They must then:

- show the number of apples with flard cards;
- write the numbers on their flard cards separately in their classroom books, showing with '+' signs that they belong together;
- write the total number **in words** in their books.

For example, if there are two hundred and sixty-eight apples on a sheet, learners should show the cards 200, 60 and 8 and write the numbers 200, 60 and 8 in their classroom books, with '+' signs i.e. 200 + 60 + 8 (expanded notation), as well as in words: *two hundred and sixty-eight.*

Circulate amongst the learners. You should still not assume that all learners will be able to count the apples in multiples of ten or a hundred. Look out for learners who are not able to do this. They will be the learners who count them one by one. Try to help these learners to see that the apples are organized into group of ten apples (in each box), and to count in tens. **This is very important.** Learners who cannot count in groups of 10 and groups of 100, in other words who do not learn to quickly "see" how many apples there are in situations like those displayed on the apple sheets, are very unlikely to make any real sense of multi-digit numbers and computation with multi-digit numbers later on.
Hand out further counting sheets to learners as they finish, until all learners have done all the sheets (E, F, G and H).

The correct answers are as follows:

For sheet E: 200 30 6	200 + 30 + 6	*two hundred and thirty-six*
For sheet F: 400 30 1	400 + 30 + 1	*four hundred and thirty-one*
For sheet G: 300 70 5	300 + 70 + 5	*three hundred and seventy-five*
For sheet H: 800 40 7	800 + 40 + 7	*eight hundred and forty-seven*

Identify those learners who are still not able to count in groups of 10 and 100, and who do not manage to write the totals correctly (in expanded notation) for the different sheets. Write the names of these learners down, so that you can work with them separately during the next two lessons.

Stop learners when half of the lesson time is over, and there is still at least 25 minutes left.

Hand out Sheet I to all learners, and ask them to do the same as they did for Sheets E to H.

The correct answer for Sheet I is:

For sheet I: 300 20 7	300 + 20 + 7	*three hundred and twenty-seven*

Hand out clean A4 sheets. Ask learners to draw *two hundred and sixty-eight* stripes on it, arranging the stripes in the same way as on Sheet I **so that it is easy to see how many stripes there are**. Write *two hundred and sixty-eight* on the board.

Ask learners to write their names on their sheets and take it in. Use this for the purposes of continuous assessment, i.e. to get an idea of where learners are in terms of their understanding of three-digit numbers. Hopefully, learners will arrange the stripes neatly in groups of ten.

Oral counting

If there is time left, have the learners count on together in 5s as far as they can go

WEEK 2: DAY 4

Notes to the teacher:

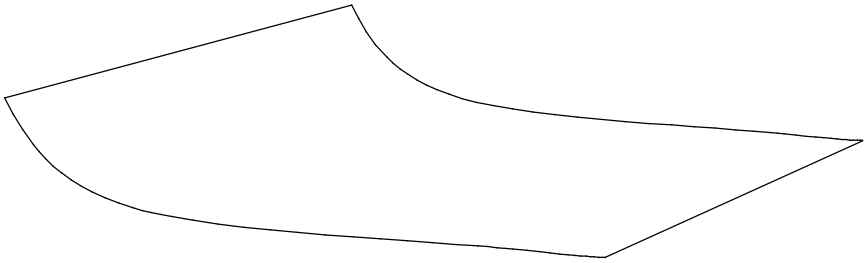
- This lesson will provide the foundation for later lessons on shapes. In this lesson you will learners how to make a 3-D box (prism), from a folded sheet of paper. You will need to practice the folding of the paper before you go into the lesson, so that you can be sure of how to demonstrate the process to your learners.
- You need to practice folding the paper before you go into the lesson, so that you can demonstrate it to the learners.

Resources:

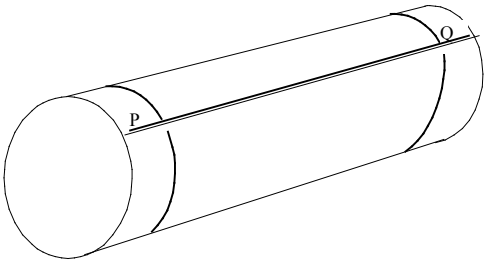
- Scissors, preferably a pair of scissors for each learner.
- Two copies of Annexure G for each learner.

ACTIVITIES FOR THE DAY

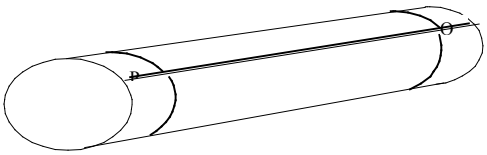
CONCEPT DEVELOPMENT



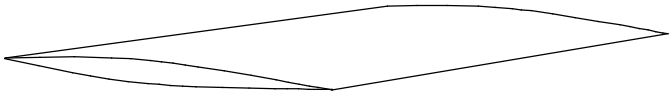
Demonstrate how to "roll" the paper into a tube, with the top edge of the sheet against the horizontal line PQ across the width.



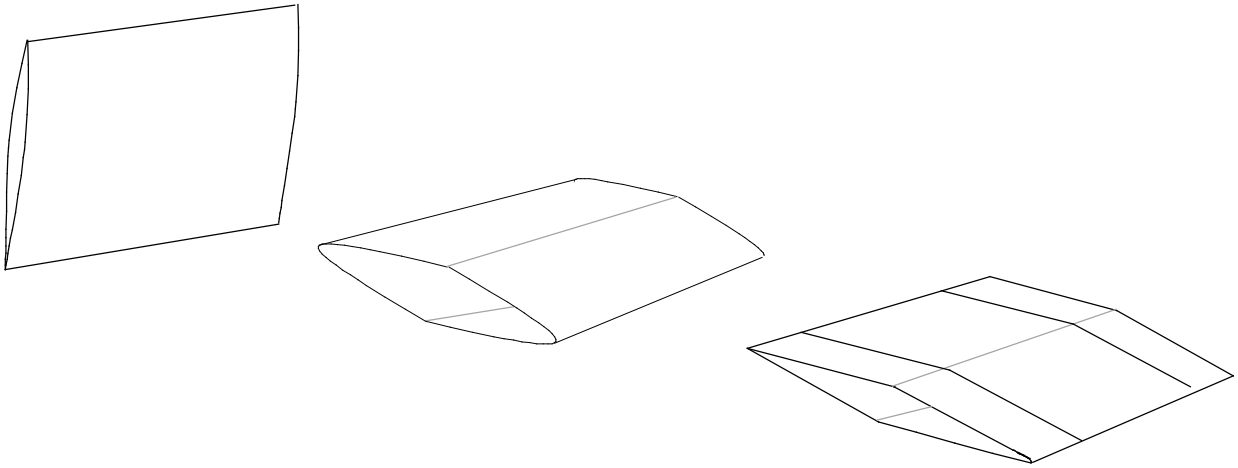
Get the learners to help each other make the tube permanent by sticking the long sides with glue, sticky tape or staples.



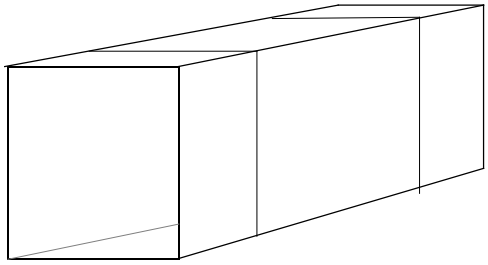
Press the tube flat and sharpen the creases.



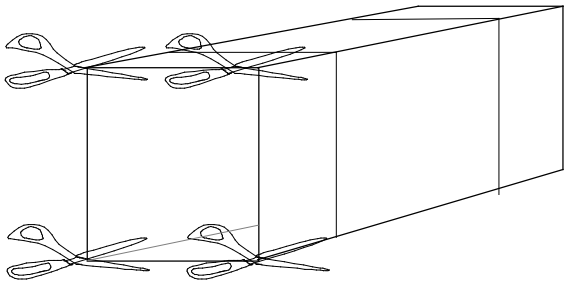
Fold it open again and press it flat to form two more creases along the length (i.e. match up the two creases already made and then press the tube flat to make new creases).



When all four long sides are properly creased, the box can be opened into shape:



To make flaps so that the box can be closed, one may cut the edges up to the printed lines:



Learners who finish quickly may make another box with Sheet B. They may also make more sturdy boxes by using cardboard from empty cereal boxes.

Keep the boxes in class for use in later lessons.

WEEK 2: DAY 5

Notes to the teacher:

- Learners who still tend to count in ones and not in groups, will spend the whole lesson counting. Spend your time with them, and try to get them to realise the benefits of counting in groups and to practice this.

Resources:

- The tally sheets learners made in Week 1 Day 4. Select at least 15 neat sheets beforehand, and make enough copies so that each learner will have at least five different sheets to count in class.
- Enough copies of one of the tally sheets for all learners. Refer to this as the "special" tally sheet.
- Annexures E and F, as prepared for previous lessons. Flard cards (one set for each learner).
- Scissors, sheets of A4 paper, and empty boxes (e.g. cereal boxes).

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Give each learner one tally sheet and ask them to find out how many marks there are on the sheet, then to show the total with flard cards and write the total in expanded notation.

Circulate between the learners. Identify those who do the task quickly and correctly, by counting in fives or tens, and who write the answer correctly in expanded notation. Tell these learners that they will not do more counting work today, but will make boxes instead.

After about 5 minutes, reorganise the class. Let the learners you have identified for making boxes move to one side of the class (the "boxmakers"), and the other learners (the "counters") to the other side. Give each of the "boxmakers" an empty box, a pair of scissors and a sheet of paper. Using the sheet of paper, challenge them to make a small box the same shape as the big box you have given them. Then leave them to do this while you attend to the "counters'.

Hand out copies of the special tally sheet to all learners in the counting group. Demonstrate to them how they can count the tallies in 5s and let them all do it together. Also demonstrate to them that counting can be also being done in 10s and then let them all do it together. Let them count more tally sheets individually. Circulate between learners and identify those that still count in ones. Work with them individually, trying to induce them to start counting in groups of 5s, or even better in groups of 10s. .

Continuously monitor the 'boxmakers". If they are successful in making small paper replicas of the big boxes you may now challenge them to cut cardboard from the big box and make small cardboard boxes that can actually be used as containers.

Return to the counting group and continue your efforts to ensure that all of them can now count by counting in groups of 10s. The counting sheets in Annexures E and F may work better than the tally sheets.

ASSESSMENT

In the last 15 minutes, give the following task as an assessment task to all the learners in the class.

Ask each learner to show a number between 300 and 400 with flard cards. They must show different numbers. Hand out a clean A4 sheet to each learner and ask them to write their name on it. They also have to write the number they have shown on their flard cards, in words, on the A4 sheets. Now ask learners to draw this number in stripes on the other side of the A4 sheet, in such a way that it would be easy for another person to see how many stripes there are. Take the sheets in at the end of the lesson. Some learners may not have managed to finish. That is fine.	
ASSESSMENT	**Formal Assessment:** Final activity in last 15 minutes of the class

FIRST TERM: WEEK 3 OVERVIEW

Hours: 5					**Number of periods: 5**
Learning Outcomes and Assessment Standards LO 1, AS 1, AS 3, AS 4, AS 5, AS 6, AS 8 LO 3, AS 1			**Milestones:** Solve different types of problems that involve addition. • Counting given structured collections of objects, recording the result by writing the number name in words, by showing it with Flard cards and by writing it in expanded notation. • Writing numbers up to 1 000 in the positional (condensed) notation • Investigates and compares (alone and/or as a member of a group or team) three-dimensional objects by making three-dimensional models • Draws, sorts and compares physical three-dimensional objects according to geometrical properties including: - Shape and/or number of faces		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Count given collections. Problems that require addition, given with pictures. Learners work in expanded notation.	Problems that involve addition and subtraction. Learners work in expanded notation.	The positional notation for whole numbers. Adding and subtracting numbers in expanded notation. Learners work in expanded notation.	The positional notation for whole numbers	3D objects: Identify faces of a rectangular prism
Resources	Copies of counting sheets J, K, L and M (Annexure H) for each learner. Flard cards (each learner).	The copies of Annexure F (sheets E, F, G and H with apples in racks) that you have used in an earlier lesson (Week 2 day 2). Have this ready, although you may not actually use it during the lesson. Flard cards (each learner). Copies of annexure I (a worksheet with questions).	Flard cards (each learner). Your two sets of big flard cards for demonstrations on the board. Copies of Annexure F (apple counting sheets E, F, G and H).	Copies of annexures E, F and H for each learner. Flard cards (each learner's own set). Annexure J Annexure K	Glue or sticky tape. A dark coloured chalk or koki pen. Three large sheets of stiff paper. A pair of scissors for each learner. Four A4 sheets for each learner The boxes learners made in an earlier lesson. A brick, and a chalk box (or other similar box) for demonstration purposes.

WEEK 3: DAY 1

Notes to the teacher:

- The purpose of this lesson is to get learners to do addition by working with numbers in expanded notation.

Resources:

- Copies of counting sheets J, K, L and M (Annexure H) for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND PROBLEM SOLVING

Activity 1

Hand out copies of sheets J, K, L and M to each learner, **for individual work**. Each learner has to individually find out how many apples are shown on each sheet, and represent the totals in expanded notation in his/her classwork book. Circulate through the learners and observe how they count. Specifically look out for learners who may still count one by one. Try to influence them to count in groups of ten and groups of 100.

The correct answers are as follows:

Sheet J: 200 + 20 + 6 Sheet K: 400 + 30 + 3

Sheet L: 300 + 40 + 5 Sheet M: 500 + 30 + 4

Take in the counting sheets J, K, L and M. Now ask learners to find out how many apples there are on sheets J and K together. Request that they show their answers with flard cards, then write it in expanded notation. Also tell them that you want them to show in writing the steps they took to find the total.

Circulate between the learners and check what they do. If you find learners who write the numbers in condensed notation as 226 and 433, ask them to work with the numbers expressed in expanded notation. The reason why learners should preferably not work with the condensed notation now is to allow them to learn how easy it is to add numbers when they are written in expanded notation.

Some learners may ask you for the counting sheets J and K to check their answers. It is good that they ask: give them the sheets they ask for.

Identify learners who have finished (using methods other than the column method). Let them compare and discuss their answers in small groups (not more than 4 learners per group).

Most learners will possibly write something like this to show their thinking to find the total, but there may be variations:

200 + 400 = 600 apples 20 + 30 = 50 apples

6 + 3 = 9 apples The total is 600 + 50 + 9 apples

There may be some learners who use the column method for addition because they have been shown to do it like that in Grade 3, (although the milestones are clear that it should only be introduced late in Grade 5). Ask these learners not to use the column method now. Tell them that it is important that they learn to do it in other ways, which will make them think of the steps they take to find their answers.

Activity 2

When you notice that some of the discussion groups have completed their discussions, write the following additional question on the blackboard:

How many apples are there on the following two sheets together?

1. Sheets J and L
2. Sheets L and M
3. Sheets K and M
4. Sheets J and M
5. Sheets L and K

Tell learners who have finished with the first question to start working on this question, **individually**.

When all learners in the class have completed the first question, conduct a whole class discussion. Start this discussion by writing the following on the board and ask learners whether they have done it like this or differently:

200 + 400 = 600 apples 20 + 30 = 50 apples

6 + 3 = 9 apples The total is 600 + 50 + 9 apples

Indicate that this is a good way to do it. Also point out that this is a good way to write it up, since it shows their thinking clearly.

Ask if any learners have done it in a different way. If some learners have done it differently, ask them to describe how they did it, and try to write that up on the board. Do not write the column method on the board though because you want to discourage learners from using it at this stage.

Ask learners to continue with the other questions that you have written on the board.

Some learners may finish quite quickly. Ask them to find out how many apples there are on all four sheets together.

WEEK 3: DAY 2

Notes to the teacher:

- This lesson provides learners with practice in doing addition and subtraction by working with numbers in expanded notation.

Annexures:

- The copies of Annexure F (sheets E, F, G and H with apples in racks) that you have used in an earlier lesson (Week 2 day 2). Have this ready, although you may not actually use it during the lesson.
- Copies of annexure I (a worksheet with questions).

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1:

Ask learners to look up, in their classwork books, the answers they have produced for the numbers of apples on sheets E and H of Annexure E, when they did the lesson for Week 2 Day 3. Ask them to write the answers again, in expanded notation. Write the correct answers on the board and ask learners to check whether they have the correct answers:

Sheet E shows 200 + 30 + 6 apples.

Sheet H shows 400 + 40 + 7 apples.

Now ask them to find out how many apples there are on the two sheets together, showing their answers with flard cards and also writing them in expanded notation.

Circulate between the learners and observe the methods they use. If you find learners who write the numbers in condensed notation (e.g. 236 and 447) discourage it – ask them to work with the numbers in expanded notation. When you identify learners who have finished, let them discuss and compare their work in small groups (not more than 4 learners per group). Learners who finish quickly with their work and discussions may be asked to find out how many apples there are on sheets E, F, G and H together.

When all learners have finished, write the following on the board:

200 + 400 = 600 apples 30 + 40 = 70 apples

6 + 7 = 13 apples The total is 600 + 70 + 13 apples.

Ask learners to represent this total with flard cards. They may have some difficulty.

Ask the class whether the same number can also be written like this:

600 + 80 + 3 apples

Allow some discussion between learners in small groups as they are seated, and also take some learner opinions for whole class discussion.

Ask learners to find out how many apples there are on sheets G and H together.

Circulate between the desks. Conclude this activity in the same way as the previous one.

Learners who finish quickly may work out the total of sheets A, B, C and D together (Annexure E, Week 2, Day 2).

Activity 2:

Give each learner a copy of annexure I (*Learners in schools).*

Ask them to read it individually.

Invite learners to call you to help them when they do not understand clearly.

Ask them to discuss the questions in small groups (no more than four) without trying to answer the questions.

Ask learners to produce answers to the questions, showing in writing how they found their answers.

Circulate and try to identify learners that have difficulty in reading the questions. Help them.

WEEK 3: DAY 3

Notes to the teacher:

- In this lesson learners learn to express numbers in the conventional positional notation, by "translating" from expanded notation to the condensed notation.

Resources:

- Flard cards (each learner's own set).
- Your two sets of big flard cards for demonstrations on the board.
- Copies of Annexure F (apple counting sheets E, F, G and H).

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1:

Ask learners to pack out their flard cards neatly in four stacks, while you hand out copies of counting sheet G (apples in trays and racks).

Ask learners to again show the number of apples on sheet G with flard cards, and circulate quickly through the desks to see the methods they use. Learners may show it like this:

300	70	5

Use your own big flard cards to also show the number like this, on the board.

Now tell the learners that you are going to move your cards around a bit. They must watch what you do carefully, and then tell you whether your cards still show the same number.

Lift the five-card off the board and put it on top of the seventy-card, like this:

300	7(5

Then move it a bit further down:

300	7 5

Ask learners whether you still show the number of apples on sheet G, but do not take answers and discussion now.

Now lift the "75" off the board and put it on top of the three-hundred card like this:

3 7 5

Ask learners whether you still show the number of apples on sheet G. Allow them to discuss this between themselves. Then conduct a whole class discussion. You should take the position that you are still showing the same number, *three hundred and seventy-five*. Argue that you are simply hiding the two zeros of the 300, and the zero of the 70.

During the course of the discussion you may take the three cards apart from time to time, and put them together again.

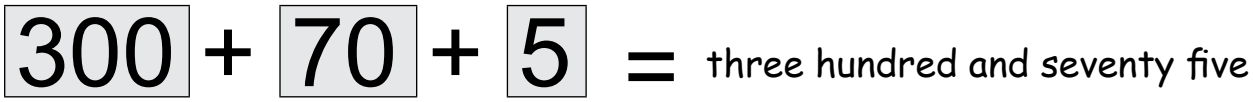
Put the “3”, “7” and “5” cards next to each other on the board like this, below the 375 is made up of the “300”, “70” and “5” cards.





Ask learners whether this display of cards also shows the number of apples on sheet G, namely *three hundred and seventy-five*. Let them discuss this between themselves for a while.

Then tell them that it certainly cannot represent the number *three hundred and seventy-five*, because three plus seven plus five is **fifteen**, not **three hundred and seventy-five**. Take the cards on the board apart again and write plus signs between them, as follows:





Now ask learners to “make” five hundred and sixty-seven by putting flard cards on top of each other, and to hold this up so that other people can see their cards. Then ask them to keep holding their cards up, but to pull them apart so that other people can see their separate cards. Check that some learners are not holding up the “5”, the “6” and the “7” instead of the “500”, the “60” and the “7”. If there are such learners, point out that they only show 18 apples and not five hundred and sixty-seven. Repeat this with other numbers for a while, until you are satisfied that all learners make numbers correctly with flard cards.

Activity 2:

Write the following question on the board:

Jeminah buys a dress for R243 and shoes for R325. How much does she have to pay?

Also put the question to learners orally, and make sure all learners understand the question.

Ask them to find the answer by first showing the amounts with flard cards and writing them in expanded notation, so that others can see how they found their answer. Also ask them to show their final answer with flard cards that are placed on top of each other.

Circulate between the learners and ensure that they do the calculation by using expanded notation, and that they represent their answer correctly by putting the correct flard cards on top of each other.

Write more similar questions on the board, for example:

1. *Jan buys a radio for R324 and shoes for R242. How much does he have to pay?*
2. *Sipho buys chickens for R328 and roof plates for R455. How much does he have to pay?*
3. *The principal buys meat for R478 and cooldrinks for R286. How much does he have to pay?*

Circulate between learners and observe how they do the questions. It will be interesting to see how they do questions 2 and 3 because of the complications. It is possible that some learners may first produce the following answer for question 2:

300 + 400 = 700 20 + 50 = 70 8 + 5 = 13

Sipho has to pay R700 + R70 + R13.

This can easily be represented by separated flard cards:

700 70 10 3

It is problematic however, to represent it with flard cards on top of each other!

You may, once all learners have engaged with question 2 to the point where they are aware of this technical problem (some may have solved it already), put the above display on the board with your big flard cards. This will make it possible for the whole class to engage with the challenge at the same time.

Invite learners to come forward with a plan. Some learners may suggest that the “70” and “10” cards may be exchanged for an “80” card, otherwise you may suggest it yourself. In any case, put the following flard card display on the board, directly below the previous cards:

700 80 3

Now the cards can be put on top of each other, to show that the number can be written as 783.

When all learners have answered question 3 correctly, you may ask some learners to show their thinking on the board with flard cards.

WEEK 3: DAY 4

Notes to the teacher:

- This lesson provides for consolidation of the conventional notation for writing multi-digit whole numbers.

Resources:

- Copies of annexures E, F and H for each learner.
- Flard cards (each learner's own set).
- Annexure J
- Annexure K

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1:

Hand out the counting sheets A to M to each learner. They have to count the apples on each sheet again, and write the answer in expanded notation as well as in the normal way, like when flard cards are put on top of each other. Learners, who wish to do so, may use flard cards to sort out how to write the numbers. Circulate amongst the learners and observe how they do this.

Suggest to learners who finish quickly that they try to find out how many apples are represented on all the counting sheets together.

When all learners have counted sheets A to M, put the following display on the board, and explain to learners what it means:

Expanded notation Long way	Cards Cards	Condensed notation Short way
300 + 40 + 7	3 4 7	347

Activity 2:

Hand out Annexure J (number writing worksheets). Learners have to do this individually and should write directly on the worksheets. Circulate and ensure that all learners understand what the tasks require of them. Take this in for marking as a formal assessment task when learners have finished.

CONSOLIDATION

Activity 3:

When learners have finished, hand out Annexure K (Adding multiples of 10). Learners have to do this individually and write the answers in their classwork books.

Special Activity

If there is time available, now or on another day, you may give each learner a set of five numbers like those below, but different sets of numbers to different learners, and ask learners to:

1. Arrange the numbers from smallest to biggest.
2. Write each number in words.
3. Write each number in expanded notation.

Learners may use flard cards to help them, if they want to.

329	499	828	536	426	485	388	316
297	824	944	962	492	789	739	684
371	451	297	983	763	729	840	574
365	587	444	958	455	909	902	323
347	334	257	395	862	543	578	520
373	647	827	912	389	383	887	476
400	273	290	784	712	439	993	575
430	536	703	447	733	472	387	506
564	850	926	616	593	901	796	897
250	576	753	610	765	877	333	578
776	529	535	971	981	995	920	928
906	959	788	461	268	407	968	632
558	557	802	594	362	839	740	592
339	699	603	697	320	729	730	663
520	598	868	734	798	667	743	673

ASSESSMENT	**Formal Assessment:** Activity 2

WEEK 3: DAY 5

Notes to the teacher:

- This is a continuation of Week 2, Day 4

Resources:

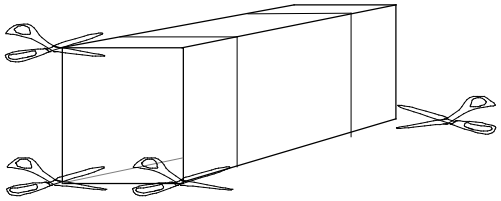
- Glue or sticky tape
- A dark colored chalk or koki pen
- Three large sheets of stiff paper
- A pair of scissors for each learner
- Four A4 sheets for each learner
- The boxes learners made in an earlier lesson
- A brick, and a chalk box (or other similar box) for demonstration purposes

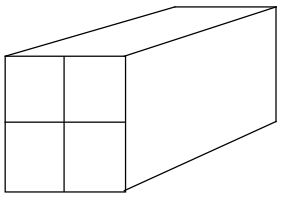
ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1:

Give each learner one of the boxes they made during the lesson for Week 2, Day 4. If they have not done this already, show them how to close the two small ends by folding the flaps over like when you wrap a parcel. They may even glue the flaps. Assist learners who work slowly.

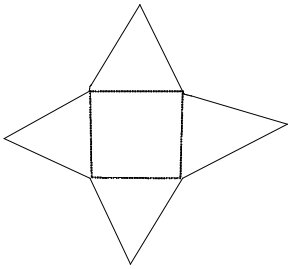




When learners have finished, show them the brick and the box you have brought to the class, and ask them to say if their closed boxes are like these objects or not. To help them to see the similarity, you may do the following:

Give each face of your brick or box a name, for example call the faces “A”, “B”, “C”, “D”, “E” and “F”, and write the names on the faces with a dark colored chalk or koki pen. Ask learners to do the same with the boxes they have made. They have to make sure that they label all the faces.

Once learners have labelled all the faces on their boxes, ask them to make a rough drawing of each face in their classwork books. They have to write the name/label of each face on its drawing.



Activity 2:

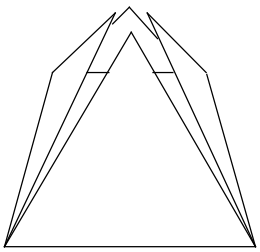
Make a drawing like this on the board, and ask learners to make a similar drawing on a sheet of paper, as big as the sheet of paper allows them:

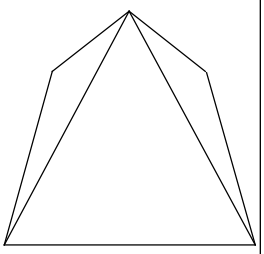
Try to make your drawing as neat as possible, with a square in the middle and four identical triangles around it, without using any instruments except a ruler.

Learners may need to make several attempts before they get reasonably good drawings.

Check that they do not make tiny drawings, but rather use the available space on the sheet of paper. Also make an example of the same drawing on your large sheet of stiff paper, so that you can demonstrate further actions to the learners.

Let learners now cut out their drawings on the solid lines, and fold up along the dotted lines so that the sharp ends meet. Also demonstrate this with your own drawing on the large sheet of stiff paper. You can stabilize the objects with sticky tape.



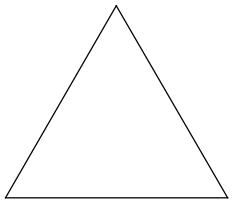


You may tell learners that such an object is called a *pyramid*, while the box they made earlier (or an ordinary brick) is called a *rectangular prism*.

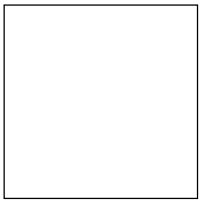
Label the faces of your big pyramid (as you did for your brick or box) and let learners do the same. Let them also draw the faces and label the drawings of the faces correspondingly.

Activity 3:

Make the following drawings on the board:







Tell learners that these flat shapes are called triangles, rectangles and squares respectively.

Write the following questions on the board:

1. How many faces does a rectangular prism have?
2. How many of them are exactly the same?
3. What shapes are the faces: squares, triangles or rectangles?

Ask the same questions for a pyramid and get the learners to answer them.

Learners have to do this individually as a written exercise and hand it in to you for assessment.

FIRST TERM: WEEK 4 OVERVIEW

Hours: 5				**Number of periods: 5**	
Learning Outcomes and Assessment Standards LO 1 AS 1, AS 4, AS 5, AS 6, AS 8, AS 9, AS 10, AS 12			**Milestones:** • Counting in a variety of intervals • Counting given structured collections of objects • Know or quickly determine addition and subtraction facts • Solve different types of problems that may involve addition and subtraction • Extend number patterns		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Practice number bonds. Problems involving money, that may involve addition and subtraction.	Problems given with pictures, that may involve addition and subtraction.	Problems given in words, that may involve addition and subtraction.	Formal assessment. Count in threes.	Count in a variety of intervals. Extend number patterns.
Resources	Annexure D (sets of number bond cards): one set for every 4 learners in the class. Each set of cards must be in a suitable container A second empty container for each set of cards. A watch on which you can accurately read a period of one minute. A copy of Annexure L for each learner. A scoring sheet (A4 or other sheet) for each group. An A4 sheet for each learner.	Annexure M. A class list. Flard cards.	Annexure M. The class list on which you noted learners' strategies during the previous lesson.	An assessment task like Annexure N.	Chalkboard.

WEEK 4: DAY 1

Notes to the teacher:

- This lesson is devoted to learning number bonds and to working on a problem which requires more than one operation.

Resources:

- Annexure D (Sets of number bond cards): one set for every 4 learners in the class. Each set of cards must be in a suitable container, for example a cut-down cereal box or a shoe box or a plastic bag.
- A second empty container for each set of cards.
- A watch on which you can accurately read a period of one minute.
- A copy of Annexure L for each learner.
- A scoring sheet (A4 or other sheet) for each group.
- An A4 sheet for each learner.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITIES

Activity 1: The number bond game

Arrange the class in groups of 3 or 4 learners. Each learner must have a classwork book and a pencil. Tell learners that they will to play a game. In each group they have to write their names on the scoring sheet, with several lines between the names so that there is space to write the points they will score. Hand out the container with number bond cards to each group. Also hand out the second empty container to each group. Explain to the class how the game will work:

- Learners will take turns of one minute to draw cards and complete the number sentences in their classwork books. For example if the card reads 30 + 40, the learner has to write 30 + 40 = 70 in his/her classwork book, then draw a next card and continue until the 60 second period is up.
- The learner has to give answers to all the cards drawn: skipping of cards is not allowed.
- You will announce the beginning and end of each one-minute periods to the class.
- When a turn is completed, the other members of the group have to check the learner's work. The learner gets one point for every correct answer, and loses one point for every wrong answer.
- Do not put used cards for which correct answers are produced back into the container with the other cards. Put them in the second container. Only cards for which wrong answers are given are put back in the original container.
- Learners have to play in alphabetical order according to their first names.
- Learners may use the trays and racks on Annexure L to help them find the answers.

Hand out a copy of Annexure L (two pages) to each learner. Announce that there will be one trial game before the real game starts. Each player will get at least one turn of one minute in the trial game. All cards are put back into the original container after the trial game.

Use your watch to tell learners when to start the first round of the trial game. When the sixty seconds is over, call STOP. Learners now need time to mark the answers and award the points, before you say START again to set the second round in motion.

Note and record at what time you start the actual game. The game continues until all the cards have been used. Some groups will finish before others. Record the time taken from when the game started, until the last group finishes, so that you can monitor progress in future.

Within each group, the learner with most points at the end wins the game. The first group of learners who finish all the cards win the team competition. Remember to take in the cards and the Annexure L sheets at the end.

PROBLEM SOLVING

Activity 2:

Inform learners that you will describe a situation to them and that they have to take notes because they will have to answer some questions afterwards. They have to do this and answer the question on the A4 sheets which you give them. Describe the situation below to youir learners, slowly and with repetitions, so that they have time to take notes:

Boitumelo goes to town with R289 in her purse. She first goes to the bank where she draws R500. Then she goes to a shop and buys a dress for R152. Then she goes to another shop where she buys groceries for R316.

Pause for a minute, so that learners can reflect on the information, before you state the following question:

Find out how much money she has left over at the end. Do all your work on the sheet.

Circulate between learners and urge them to write all the numbers in expanded notation before they try to do the calculations. Write this new question on the board while learners are working:

Do this in your classwork books:

Geraldine goes to town with R324 in her purse. She first goes to the bank where she draws R400. Then she goes to a shop and buys a dress for R158. Then she goes to another shop where she buys groceries for R228.

Find out how much money she has left over at the end. Do all your work on the sheet.

Circulate between the learners again. Take in the sheets of learners who have finished with the first question (remember to ask them to write their names on their answer sheets). Then point them to the second question on the board. At the end of the lesson, take in all learners work on the first question, even if they have not finished.

Spend time looking at their work for question 1 carefully. You need this information about their thinking so that you can support them further with respect to the development of their problem-solving and computational skills.

WEEK 4: DAY 2

Notes to the teacher:

- In the first half of the lesson learners will count and solve simple problems with respect to situations represented with pictures. In the second half of the lesson they will work further on the two problems of the previous day.

Resources:

- Annexure M
- A class list

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1:

Hand out copies of the three sheets of Annexure M.

Ask learners to find out, for each room, how many apples are needed to fill the racks up to 600 apples in total (in the room).

Circulate between the learners and observe how they deal with the situation. There are at least three quite different strategies that learners might follow:

A. Concretely, by counting: They may count the "open spaces" in the racks in the room.

B. By "filling up": They may count the apples on the racks in the room and then find out how much should be added to this number to get 600.

C. Abstractly, by subtracting: They may count the apples on the racks in the room and then subtract this number from 600, in some way or another. If there are learners who do this, you may find their methods of subtraction quite interesting.

Make notes in your class list which strategy each learner uses, so that you can compare it with the strategies they use in later lessons.
While learners are still working, rearrange them so that they are seated in small groups made up of learners who use all of the three strategies above. At some stage before learners have finished with all three pages, stop them and ask them to tell each other how they are doing the work. It will be very helpful for learners to become aware that the same task may be tackled in different ways.

Do not spend more than half of the lesson time on this activity, even if some learners do not finish all the rooms. Take in the three sheets (Annexure M) at the end.

PROBLEM SOLVING

Activity 2:

Let learners work in four different ways for the second half of the lesson, depending on how far they have progressed on the previous day:

If some learners did not finish solving the following problem on the previous day, write it on the board and let those learners continue to work on it (give them back their written work that they handed in at the end of the previous lesson):

Boitumelo goes to town with R289 in her purse. She first goes to the bank where she draws R500. Then she goes to a shop and buys a dress for R152. Then she goes to another shop where she buys groceries for R316.

Other learners may have finished the above problem, but did not start with the second problem. Arrange these learners in groups of not more than four and ask them to tell each other how they thought and calculated how much money Boitumelo has left. When they have exhausted the discussion, they may start working individually on the Geraldine problem.

Some learners may have done some substantial work on the second problem, but not finished it yet:
Geraldine goes to town with R324 in her purse. She first goes to the bank where she draws R400. Then she goes to a shop and buys a dress for R158. Then she goes to another shop where she buys groceries for R228.
Find out how much money she has left over at the end. Do all your work on the sheet.

Write the problem on the board again and let these learners continue to work on it individually.

For those learners who have finished the above problem, arrange them in groups of not more than four and ask them to tell each other how they thought and calculated how much money Geraldine had left.

WEEK 4: DAY 3

Notes to the teacher:

- In this lesson, learners will have opportunities to progress from problems presented with pictures, to similar problems presented in text only.

Resources:

- Annexure M.
- The class list on which you noted learners' strategies during the previous lesson.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1:

Hand out the first sheet (*Room A, Room B*) of Annexure M to each learner. Tell learners that the racks in room B have to be filled up so that there are 100 apples in each rack. These apples have to be taken from Room A. Allow learners to discuss this between themselves for one or two minutes, to check whether they understand the situation in the same way.

Tell learners that they have to find out how many apples will be left in Room A after the racks in Room B have been filled up. They have to do this individually. Circulate between learners and observe how they do it. Briefly note which strategies different learners use and relate it to the strategies (counting, filling up and subtraction) they have used during the previous lesson.

Put those learners who have finished together in groups of three or four. Put learners who have used quite different strategies in the same group. Ask them to tell each other how they did it.

When a group has finished talking, tell the learners to do the same for the second sheet (rooms C and D), and later the third sheet. After about 25 minutes, write the following problem on the board:

There are 396 apples in room G and 425 apples in the six racks of room H. All the racks in room H have to be filled up to 100 apples each.
These apples have to be taken from room G. How many apples will be left in room G?

PROBLEM SOLVING

Activity 2:

About halfway through the lesson, tell learners to stop working even if they have not finished with all three sheets. Ask them to now tackle the problem you have written on the board, individually. Talk through the problem with them so that limited reading ability does not hinder them from understanding the situation.

Circulate amongst the learners. Identify and support learners who may struggle to understand the situation and the question. You may point out that it is similar to the earlier questions.

Observe how learners do this question. Once more you will probably observe a variety of different strategies. Again find time to briefly note which strategies different learners use and how this may differ from the strategies they used during Activity 1.

WEEK 4: DAY 4

Notes to the teacher:
- The first part of this lesson is devoted to assessment.

Resources:
- An assessment task like Annexure N.
- The sheets *Table B* and *Table C* from annexure R

ACTIVITIES FOR THE DAY

Activity 1 (Assessment) (40 minutes)

Ensure that learners are seated so that they can do individual work and that they all have pencils. Tell them that they will work individually for the whole period because you want to find out how each of them think and what they can do.

Hand out the assessment task (Annexure N). Circulate between the learners and ensure that learners understand the questions. Do not allow limited reading ability to keep learners back.

Activity 2

Arrange learners in groups of no more than 4 learners per group. Hand out the banana counting sheets *Table B* and *Table C*.

Each group must now count *very softly* in threes, together: *three, six, nine, twelve, etc.* up to fifty. They may "follow" their counting on Table B if they want to.

Once they have reached 50 (actually 48), they should start again. It will go a bit better the second time. They should repeat this a few times.

Then learners should individually find out how many bananas there are on Table B.

WEEK 4: DAY 5

Notes to the teacher:

- This will be learners' first experience with number patterns (sequences) for the year.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1:

Write the following numbers on the board:

4 10 16 22 28

Ask learners to write these numbers in their classwork books, and to also write what they think the next ten numbers might be. Ask learners to explain in writing why they propose these numbers and not others.

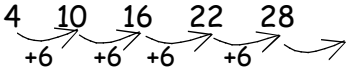
Circulate between the learners. Identify those that have finished writing their numbers and their explanations. Group them together (not more than four per group) to discuss their answers and explanations. Also ask them to each design more similar sequences (with different numbers) on their own.

When all learners have extended the initial sequence by ten more terms, and have written down an explanation, interrupt the deskwork and conduct a whole class discussion. Start by writing the extended sequence below the original sequence on the board, so that the board display looks like this (leave some space between the two rows as indicated):

4 10 16 22 28

4 10 16 22 28 34 40 46 52 58 64 70 76 82 86

Ask some learners to explain how they knew the numbers after 28 should be 34, 40, 46 etcetera. Some learners will explain that they have noticed that the number increase by 6 each time (or that 6 is added). Demonstrate on the blackboard how this observation can be recorded with arrows underneath the numbers:



4 10 16 22 28 34 40 46 52 58 64 70 76 82 86

Also demonstrate the following alternative ways of recording how a sequence works:

$4 \xrightarrow{+6} 10 \xrightarrow{+6} 16 \xrightarrow{+6} 22 \xrightarrow{+6} 28 \xrightarrow{+6} 34 \xrightarrow{+6} 40 \xrightarrow{+6} 46$

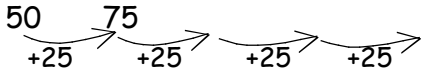
4 + 6 → 10 + 6 → 16 + 6 → 22 + 6 → 28 + 6 → 34 + 6 → 40 + 6 → 46 . . . . .

Learners may use any of these recording techniques when they work with sequences.

Activity 2:

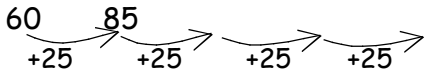
Write the following on the board and ask learners to continue the pattern as far as they wish in writing:

Pattern B



Write more tasks like this on the board, for learners to work on:

Pattern C



Pattern D: Start at 20 and add 5 each time

Pattern E: Start at 200 and add 15 each time

Pattern F: Start at 500 and add 40 each time

You may specify more patterns yourself.

You may also invite learners to specify patterns for themselves and then extend the patterns.

If there is time left, let learners count in 3's and 5's starting from any number between 100 and 200. You may also make copies of the next page and let them extend the number patterns as far as they wish, or as far as you specify. This task, or part of it, can also be given for homework, and can be used for assessment purposes..

Copy each number pattern, and extend it as far as you wish.

A	2	4	6	8	10
B	3	6	9	12	15
C	4	8	12	16	20
D	5	10	15	20	25
E	6	12	18	24	30
F	7	14	21	28	35
G	8	16	24	32	40
H	9	18	27	36	45
I	10	20	30	40	50
J	11	22	33	44	55
K	12	24	36	48	60
L	13	26	39	52	65
M	14	28	42	56	70
N	15	30	45	60	75
O	16	32	48	64	80
P	17	34	51	68	85
Q	18	36	54	72	90
R	19	38	57	76	95
S	62	64	66	68	70
T	93	96	99	102	105
U	124	128	132	136	140
V	155	160	165	170	175
W	186	192	198	204	210
X	217	224	231	238	245
Y	248	256	264	272	280
Z	279	288	297	306	315
AA	310	320	330	340	350
BB	341	352	363	374	385
CC	372	384	396	408	420
DD	403	416	429	442	455
EE	434	448	462	476	490
FF	465	480	495	510	525
GG	496	512	528	544	560
HH	527	544	561	578	595
II	558	576	594	612	630
JJ	589	608	627	646	665

FIRST TERM: WEEK 5 OVERVIEW

Hours: 5				**Number of periods: 5**	
Learning Outcomes and Assessment Standards LO 1 AS 3, AS 5 LO 4, AS 7			**Milestones:** • Uses the appropriate SI unit to estimate, measure, record and compare: Length metres • Solves problems involving equal sharing and measurement, involving fractions including halves, thirds, quarters, fifths, eighths and tenths and mixed numbers involving these fractions - decimal notation for tenths		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Oral and Mental Work	Estimate and compare lengths	Taking measurements, counting number of units	Taking measurements, counting number of units	Taking measurements, counting number of units	Taking measurements, counting number of units
Content Focus	Non-standard and standard units of measurement	Concept of fractions: eighths	Concept of fractions: tenths	Concept of fractions: thirds, quarters, etc up to ninths Equivalent fractions	Decimal notation for tenths and halves. The metre as a unit of measurement.
Resources	Measuring strips, tables	A pair of scissors for each learner. Measuring strips and objects to measure (Annexure Q)	A pair of scissors for each learner. Measuring strips and objects to measure (Annexure Q)	A pair of scissors for each learner. Measuring strips and objects to measure (Annexure Q)	Metre stick. Metre length of string for each learner.

WEEK 5: DAY 1

Notes to the teacher:

- Learners begin with a mental activity where they estimate measurements of lengths by direct comparison. They do an activity that some may have done in the Foundation Phase as well, where they use non-standard units to estimate and measure lengths using different body measures. This leads to a discussion on why we need to use standard measures instead for greater consistency and reliability.
- Estimation is an important skill to be integrated wherever possible with all measuring activities. Being able to estimate and measure lengths relies on developing mental models, applying these and then checking them against actual measurements.

Resources:

- Make measuring strips from paper of 10 cm; 15 cm; 20 cm; 30 cm; 40 cm and 60 cm. You can also use strips made of cardboard, plastic or wood found in standard maths kits.
- Tables for recording measurements, available objects to measure inside and outside the classroom**.**

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

- Hold up two measuring strips of different lengths at the same time. Ask learners to say which is longer or shorter. After each turn, paste the strips on the board with prestik.

- Ask a learner to help you order the strips from shortest to longest. Ask follow-on questions like:
  How many of strip A (10 cm) will equal the length of strip B (30 cm)?
  Which strip is half the length of C (30 cm), twice the length of C?

- Ask them to find objects around their desks or tables that are the approximate length of each of the strips. Give different learners the chance to match their lengths against each strip on the board.

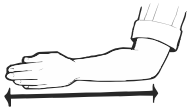
CONCEPT DEVELOPMENT (10 minutes)

- Draw a large rectangle on the board. Ask learners what features of the rectangle can be measured. They may mention the width, length, the distance around the rectangle, or even the amount of space inside the shape, its area. Focus for now on linear measurements *(the length, width and perimeter).*

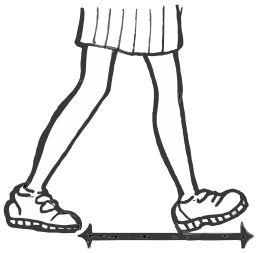
- Ask them to imagine that they were farmers living a long time ago before people measured in metres or centimetres or had measuring tools like rulers, trundle wheels or metre sticks, but used body measures instead. For example, they may have used their hands to measure the height of a horse, or cubit lengths *(the distance from the elbow to tip of middle finger)* to measure the length of a fence, or thumb widths to measure the spaces between plants. Ask learners to show some of these measures on their own bodies. For example:

a palm **a finger**









A CUBIT **A STRIDE**

Ask questions that help learners evaluate which of these measures they would use to estimate and measure the lengths or widths of different objects around them. For example:

Would you use hand-widths to measure the width of a classroom?

Could you use your pace to measure the length of an eraser?

GROUP INVESTIGATION (30 minutes)

- Learners now work in mixed ability groups of 4 or 5. Each group takes turns to measure the same list of objects in the table below. Choose other objects if these are not suitable for your context. Group members must decide for themselves which part of their body to use for each measurement and agree on a reasonable estimate of how many measures they would use before they measure. They then take turns to measure a different object and then discuss and compare the differences between their estimations and the number of units they used.

Object	**Units**	**We estimate**	**We count**
Length of pencil	*(thumb width)*		
Length of desk	*(hand span)*		
Width of classroom	*(foot length)*		
Length of the corridor	*(pace)*		

- As learners work, move around the different groups to observe and give support. What is important is that they measure from end to end in a straight path, leaving no gaps between one measure and another and no overlaps. Learners who finish quickly can measure more objects and add these to their lists and also be asked to help learners who are struggling.
- When the groups are finished, review the findings of different groups together. Talk about the likely differences in their measurements and why these come about. *(different lengths of hands, feet fingers etc).*They should also be able to explain how, when measuring the width of the classroom for example, the learner with a longer foot uses up fewer feet than the learner with a shorter foot and vice versa. Use this to discuss the need for using standard units.

CONSOLIDATION (10 minutes)

- Hold a whole class discussion where you guide learners to reflect on what they have learned so far. Learners should be able to compare and evaluate the method of using different body measures with using instruments like rulers or metre sticks. They can explain what happened when they found an object to be a little under or over the length of the body measure being used. Did they count on one length or take off a length? What did they call the extra bits? Is this an accurate enough measurement?
- Think about the way we name these lengths and communicate this information to others. Can we tell a salesperson for example, that we want a bed that is 10 handspans long? Why not? Talk about examples in life when it's very important to measure 100% accurately and when it's not. Guide the discussion to where learners can explain that standard instruments and standard units are necessary to help us to communicate information about length in uniform ways.

WEEK 5: DAY 2

Notes to the teacher:

- Activity 1 serves to revise the idea of a fraction in the context of fair sharing. In Activity 2, learners are introduced to fractions as units of measurement.

Resources:

- A copy Pencil sheets A and B of Annexure Q for each learner, and some spare copies.
- A pair of scissors for each learner.
- This drawing on the board:



ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY

Activity 1:

Ask learners to solve this problem:

Eight learners have to share two loaves of bread. How much bread should each learner get?

If learners have difficulties, suggest that they make a rough drawing of the two loaves of bread.

Once learners are happy with the idea that each learner will get one quarter of a loaf, ask them to solve the following problem:

Sixteen learners have to share two loaves of bread. How much bread should each learner get?

Allow some discussion after the majority of learners have solved the problem and ensure that all learners understand why the piece each learner will get may be called *one eighth* of a loaf – it is because the loaf is divided into eight equal pieces.

Do not use the common fraction notation $\frac{1}{4}$ or $\frac{1}{8}$ at all in this lesson or even in this term. It is important that learners develop a proper understanding of the meaning of fractions before they are introduced to the notation, otherwise they tend to interpret the notation as just meaning two separate numbers of the same kind which is very false. Write fractions in words at this stage, for example *1 eighth*. It is also critically important that learners say the fraction names, although the “th” is quite difficult for non-English speakers!

Finally ask learners what they would call each piece if a loaf of bread is shared fairly between five learners.

CONCEPT DEVELOPMENT

Activity 2:

Tell the class that they will make measurements again today, not in metres as the previous day, but by using the short measuring strips on the sheets that you hand out.

Hand out a copy of Pencil Sheet A and a pair of scissors to each learner. Ask them to cut out one of the stick-rulers, including the two darkly coloured endpieces that are not part of the stick itself. The "stick" will now be their unit of measurement, like the "metre" was on the previous day. Circulate and check that they cut the rulers out correctly. Some learners may cut out just the stick without the endpieces. Correct them. They may cut out the second printed stickruler then.

Once all learners have cut out their stick-rulers, ask them to try to measure the pencils on sheet A. They have to do this individually and write down their findings. Tell learners that they may not be able to measure all the pencils accurately.

It is very important that learners personally experience the problem of not being able to measure objects accurately, because this problem was the reason why people (the Egyptians in North Africa) originally invented fractions: as a tool for precise measurement.

Circulate between learners and ensure that they do not include the endpieces in their measurements. The drawing you have made on the board, with the pencil that is 1 STICK long, may be helpful to learners.

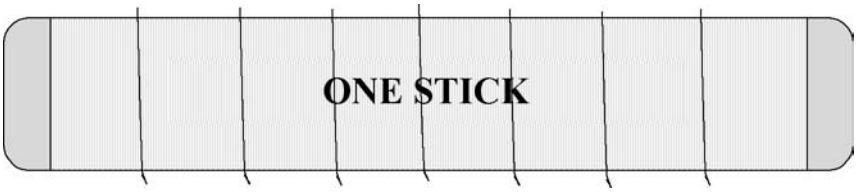
Learners' written reports may look something like this:

Pencil A is two STICKS long.
Pencil B is longer than 1 STICK.
Pencil C is about one and a half STICKS long.
Pencil D is about one and a half STICKS long.
Pencil E is a bit more than two STICKS long.
Pencil K is a small bit longer than one STICK.

Some learners may say Pencil B is one and a half STICKS long. You may ask them how long Pencil C is then and point out that it is shorter than Pencil B. However, when you interact with learners now, keep in mind that the actual lengths of pencils B, C, D and E cannot be satisfactorily determined now.

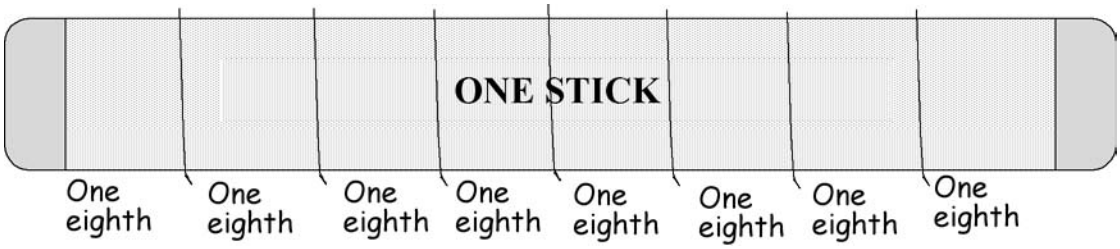
The purpose of Activity 2 is that learners should come to realise that one cannot measure all the pencils accurately. Once you are sure that all learners realise this, you may suggest that they cut out the second stick-ruler and fold it to form smaller pieces that are parts of a stick. Ask them to cut off the darker endpieces in this case. By folding the second stick-ruler in half and putting it next to the first stick-ruler, they should be able to make somewhat better measurements already. Ask learners to fold the second stick-ruler over in half again and again (you may need to demonstrate this) and ask them how many smaller pieces are now formed.

You may wish to make marks on the drawing on the board, to support their thinking:



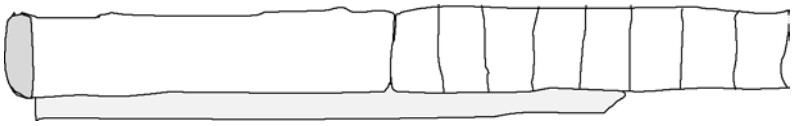
Ask learners to discuss in small groups what these smaller pieces may be called. It is extremely important that all learners have the opportunity to make sense of the idea to call the pieces "eighths", since this is at the heart of the fraction concept and some learners may previously

have missed out on making the connection between the number of equal parts and the name given to the parts. Circulate between the discussion groups and listen to what they say. When all or most learners in the class are using the term “eighths”, you may go to the board and write as shown below:



Do not use the common fraction notation $\frac{1}{4}$ or $\frac{1}{8}$ at all in this lesson or even in this term.

Ask learners to use the divided stick-ruler in combination with the original stick to try to measure the pencils better than before, starting with pencil B. They will need to put the two sticks next to each other, and you may make a rough drawing on the board to demonstrate this.



Require learners to write down their results for the different pencils, in words as demonstrated below (write it on the board):

Pencil B is STICKS long

Circulate between the learners. As soon as all of them have established the length of pencil B correctly, complete the sentence on the board:

Pencil B is one STICK and five eighths of a STICK long

It is quite important that, throughout these three lessons on fractions, you consistently check and demand that learners write their results for the different pencils out in full, correctly.

The lengths of the different rulers on sheet A are:

Pencil A: 2 STICKS

Pencil B: 1 STICK and 5 eighths of a STICK

Pencil C: 1 STICK and 4 eighths of a STICK (or one and a half STICK)

Pencil D: 1 STICK and 3 eighths of a STICK

Pencil E: 1 STICK and 7 eighths of a STICK

Pencil K: 1 STICK and 1 eighth of a STICK

If there is time left, you may hand out pencil sheet B and learners may cut out the long ruler with subdivisions on one STICK. Let them use this ruler to check the measurements for pencils B, D, E, F and K.
If there is still time left, they may also start to measure the pencils on sheet B.

Learners will not be able to measure pencil L accurately with the eighths ruler. This problem provides motivation for having more subdivided rulers, with other fraction parts of a STICK

WEEK 5: DAY 3

Notes to the teacher:
- Learners will do more measurements with fractions, and learn about tenths.

Resources:
- Pencil sheets B, C, D and E of annexure Q.
- A pair of scissors for each learner.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

If this was not done on the previous day, hand out pencil sheet B. Let learners cut out the long ruler with subdivisions one stick. Let them use this ruler to check the measurements for pencils B, D, E, F and K.

Next, learners should measure the pencils on sheet B, and write down the measurements as described in the previous lesson plan.

Learners will not be able to measure pencil L accurately with the eighths ruler. This problem provides motivation for having more subdivided rulers, with other fraction parts of a STICK.
Tell learners that they will get another ruler on sheet C, with which they can try to measure pencil L.

Hand out pencil sheet C and let learners cut out the rulers. They must first try to measure pencil L accurately with the new ruler, then proceed to the measure all the pencils on sheet C and write down the results properly as before.
Circulate between learners. Pencil X will be a problem.

Identify learners who have written down all the measurements correctly (except pencil X of course). Hand out sheet D to these learners and ask them to continue and try to measure all the pencils on sheet D and write the answers down. A little later, also give the learners copies of sheet E and tell them they may cut out and use these rulers too.
Some learners may not get as far as sheets D and E today.

The lengths of the pencils on sheet B are:

Pencil F: 3 eighths of a STICK
Pencil G: 3 eighths of a STICK
Pencil H: 5 eighths of a STICK
Pencil J: 7 eighths of a STICK
Pencil L: 7 tenths of a STICK

The lengths of the pencils on sheet C are:

Pencil M: 4 tenths of a STICK
Pencil P: 1 and 6 tenths of a STICK
Pencil R: 6 eighths of a STICK
Pencil S: 9 tenths of a STICK
Pencil T: 1 and 9 tenths of a STICK
Pencil V: 1 and 8 tenths of a STICK
Pencil W: 1 and 7 eighths of a STICK
Pencil X: 4 sixths of a STICK

WEEK 5: DAY 4

Notes to the teacher:

- The work on fractions is continued, by learners taking measurements with fraction-rulers. Some learners may have time to become aware of equivalent fractions.

Resources:

- As for the previous day.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Hand out sheet D to the learners who did not get it in the previous lesson and ask them to continue to measure all the pencils on sheet D and write the answers down. A little later, also give them copies of sheet E and tell them they may cut out and use these rulers too. Remind learners that they have to write out their results in full and write some demonstrations for pencils from sheets A and B on the board. Learners may write the names of the fraction parts on their different rulers, so that they do not have to count the number of segments each time they use a ruler.

Pencils KK and HH will be problematic: these pencils cannot be accurately measured with the fractional parts on the given rulers.

At the end of this lesson, learners should put their fractionrulers and pencil sheets in an envelope or folder, for later use.

Activity 2:

Identify learners who have finished and written correct answers for all the pencils on sheet D except KK and HH. Suggest to learners that they may change some of the rulers they have, to make new rulers that can be used to measure these two pencils.

For pencil HH, they may try to modify the ruler with eighths and for pencil KK, they may try to modify the ruler with tenths.

The lengths of the pencils on sheet D are:

Pencil S: 9 tenths of a STICK Pencil BB: 8 ninths of a STICK Pencil J: 7 eighths of a STICK Pencil Y: 6 sevenths of a STICK
Pencil Z: 5 sixths of a STICK Pencil AA: 8 tenths of a STICK Pencil R: 6 eighths of a STICK Pencil X: 4 sixths of a STICK
Pencil DD: 5 tenths of a STICK

Pencil EE: 1 and 4 ninths of a STICK Pencil FF: 1 and 2 sevenths of a STICK Pencil GG: 1 and 2 tenths of a STICK
Pencil NN: 1 and 1 seventh of a STICK Pencil JJ: 1 and 1 ninth of a STICK Pencil KK: 1 and 7 twentieths of a STICK
Pencil LL: 5 sevenths of a STICK Pencil MM: 7 ninths of a STICK Pencil HH: 1 and 5 sixteenths of a STICK

Activity 3:

Write the following on the board, but do not try to resolve the issue in class:

Pencil G is 3 sixths of a STICK long. Pencil G is 5 tenths of a STICK long.
Pencil G is 4 eighths of a STICK long. Check whether this is all true.
How can the same pencil have different lengths?

ASSESSMENT	**Formal Assessment:** Activity 1 (take in the classwork books)

WEEK 5: DAY 5

Notes to the teacher:

- On day 2 we introduce the metre as the first standard unit of length they need to know about and measure with. The activities focus on estimating and measuring lengths in metres and then grappling with ways to deal with and name the bits over or under a whole metre measurement. This will help learners to understand the need for smaller units of measure in between metres to measure smaller lengths more accurately.

Resources:

- Metre stick. If a metre stick is not available, you may make one from strips of carton: shoebox carton will work well.
- Cut lengths of string a metre long for each group to work with

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Inform learners that "one tenth" is often written as 0,1, and "3 tenths" as 0,3. Inform them that this is called the *decimal notation* for fractions.

Ask them to suggest how each of the following may be expressed in the decimal notation:

2 tenths, 5 tenths, 9 tenths.

Also ask learners whether 5 tenths and one half are the same, and let them discuss this.

Activity 2 (10 minutes)

Learners work in groups.

- Introduce a metre as the first standard unit learners are going to work with. Hold up your metre rule and show how from the first to the last mark on the rule, rather than from end to end, measures exactly one metre.
- Hold the stick both vertically and horizontally and ask learners to imagine in their minds objects that measure either a metre up and down (length) or a metre across (width).
- Ask learners to stand up and look around at the heights of different learners in the class and then in their groups and to think about which of them are about a metre tall, taller than a metre or less than a metre.
- Ask several learners from each category (a metre tall, taller than a metre or less than a metre) to come to the front of the classroom. Use your metre stick to measure their heights. Learners can then review how close their estimations were and in doing so, build a mental picture of how long a metre really is.

INVESTIGATION (35 minutes)

Learners work in their groups again to measure their heights using a metre length of string.

- Cut lengths of string a metre long for each group beforehand. They take turns to measure their heights against the walls or the door. One of the learners holds one end of the string above the head of the learner who is being measured, while another learner pulls it down straight in line and holds the string in position. They must think up their own ways to describe the bits over or under. For example, just over a metre, a little less than a metre, almost a metre etc. Some learners may use fraction names as well like one-and-a-half and one-and-a-quarter. Learners record the heights of their group members in a table:

Name	Metre lengths
Patsy	One and a bit
Vusi	Less than a metre

Draw a table on the board to collate the data from the different groups in this way

About a metre	More than a metre	Less than a metre
	Patsy	
		Vusi

- Group their data. Ask learners to help you find the most common measurement among the class members. This links with finding the mode or most common or popular measurement in a set of data, something they will learn more about in Data in Grade 5, but that is easy enough for them to do.
  Using their metre lengths of string, the groups must now find at least three objects or lengths to measure that are about 1 metre, half a metre and 2 metres long. Where they find the lengths to be over or under a whole metre, they again find their own ways to describe these, for example: 'a metre and a bit, or 'just under half a metre, or naming these parts as fractions, e.g. as 1 metre and 3 quarter metres. Draw a table like this on the board for each group to copy and record their findings.

Name of object	1 metre	Half a metre 0,5 metre	2 metres

Whole Class Review (5 minutes)

Give each group enough time to give feedback on at least one object they measured for each category in the table. Record their findings in the table. Talk about how these measurements were approximations and good estimations but that at times it is important to take accurate readings. This should lead to a discussion on the need for smaller units to measure the bits over or under a metre.

FIRST TERM: WEEK 6 OVERVIEW

Hours: 5				**Number of periods: 5**	
Learning Outcomes and Assessment Standards LO 1 AS 3, AS 5 LO 2 AS 1 LO 3 AS 1			**Milestones:** • Investigate and extend number patterns. • Mentally add and subtract single-digit numbers, multiples of 10 to at least 100, and multiples of 100 to at least 500, to and from three-digit numbers • Recognises, identifies and names two-dimensional shapes including: - Circles - Polygons (hexagons) • Know or quickly determine multiples of single-digit numbers to at least 100 (multiplication tables).		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Number patterns	Addition and subtraction: Multiples of 10 and 100. Number patterns.	Number patterns; Addition and subtraction	2D shapes: hexagons; circles	Multiplication tables
Resources	Chalkboard. Annexure K.	Number bond cards as used previously. A copy of Annexure L for each learner.	Number bond cards as used previously. A copy of Annexure L for each learner.	A pair of scissors for each learner. At least one stapler, but preferably two or three. Sticky tape or masking tape. Three clean A4 sheets per learner. A large empty cereal box. A large carton tube for you to draw circles on the board.	Sheets with grouped objects (Annexure R). Chalkboard, worksheets.

Note:
The lesson on shapes (Week 6, Day 3) can be done on any day. If there is a shortage of scissors in the school, different classes can have this lesson on different days of the week.
Note that each learner will need a large empty cereal box for this lesson.

WEEK 6: DAY 1

Notes to the teacher:

- Learners will do more work on sequences, including sequences which do not have a constant difference between the terms. A major purpose of this lesson is to develop learners' abilities to communicate about numbers and mathematical relationships, and to express their thoughts in words.

Resources:

- Copies of Annexure K.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Ask learners to look up what they wrote in their classwork books for the lesson of Week 4 Day 5, and to talk about what they remember from that lesson in small groups for 3-4 minutes.

Write the following on the board and ask learners to copy and continue the patterns for at least six more numbers in each case.

Pattern A:	5	6	8	9	13						
Pattern B:	1	2	4	8	16						
Pattern C:	2	3	5	9	17						
Pattern D:	5	6	8	12	20						
Pattern E:	5	6	8	9	13	18	22	25	27	28	29

Write the following instruction on the board:

When you have finished, write a story in which you describe in what ways these patterns are the same, and in what ways they are different. For each pattern, describe how someone can work out what the next number is.

Circulate between learners. Identify learners that have finished extending the number patterns and point them to the instruction on the board. Explain it to them if they have reading difficulties.

As time moves on, also identify learners who have finished writing their stories. Arrange them in groups of three or four learners and ask them to compare their stories and then to agree on how each pattern can be described in words in one sentence. They have to write these sentences down. Each learner in the group should write these sentences down.

Keep circulating, and monitor what learners are doing. Identify groups that have agreed on the sentences to describe each pattern. Mix and match them with other groups who have finished and ask the new groups to decide on how each pattern can be described with a single sentence. Ask these groups to write their final sentences on a loose sheet with their names on it and to hand it in to you.

Write the following new sequences on the board:

Write the next twenty numbers in each pattern:

Pattern G:	15	26	39	54	71		
Pattern H:	105	130	165	190	225	250	285
Pattern I:	2	5	11	20	32	47	
Pattern J:	5	12	26	47	75		
Pattern K:	1000	982	964	946	928		

When groups hand in their final sentences to you, point them to the new task on the board.

Coordinate the work on the new task exactly as you coordinated the work on the first task.
If there is time left, let learners do the questions in annexure K again. They should try to produce the answers as quickly as possible, and should write down each result in the form of a number sentence, for example 30 + 40 = 70.

On Week 1 Day 1 you will have asked learners to each bring a carton (for example an empty cereal carton) to school. Check how many cartons have come in. You need a large cereal carton for each learner for the first lesson on shape on Week 6 Day 3. If there are not enough cartons, remind learners to bring something on Day 2.

WEEK 6: DAY 2

Notes to the teacher:

- In this lesson learners will have the opportunity to consolidate their knowledge of addition and subtraction facts for multiples of ten and hundred.
- In the second half of the lesson, learners will engage with some number patterns (sequences) that behave in strange ways. This will also require them to count in various group sizes, including 7. In fact, the number patterns here just provide an interesting context for practicing addition and subtraction with small numbers.

Resources:

- The sets of number bond cards as used previously.
- A copy of Annexure L for each learner, in case they need it for the number bond game.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY

Activity 1:

Play the number bond game, as described in the lesson plan for Week 4, Day 1. This should occupy roughly the first half of the lesson. Compare the performance (speed) of the class with their performance on the previous occasions when they played this game.

CONCEPT DEVELOPMENT

Activity 2:

Inform the learners that a friend of yours has designed a sequence. The first three numbers in the sequence are 12, 19 and 26. Inform the learners that later you will tell them what the next twenty numbers in your friend's sequence are. Ask them to first write the three given numbers in their classwork books and to also write what they think the **next ten** numbers could be.

Circulate and observe what learners do. It is very likely that most, if not all of them, will notice the constant difference of 7 and produce the following:

12 19 26 33 40 47 54 61 68 75 82 89 96

Allow learners to come to agreement on what the numbers could be. Then write their numbers on the board. Tell learners you will now show them the first fifteen numbers in the sequence that your friend has designed and write this on the board, directly below their numbers:

12 19 26 33 40 47 54 61 68 75 78 71 64

Ask learners to try to find out how your friend's pattern works and to write the next ten numbers in his pattern. Once they have ideas, they may share and discuss this with classmates. After about 5 minutes, ask each learner to predict the next ten numbers in your friend's pattern. Once all learners have written this down, you may write the following on the board, extending from the first part that you have written previously:

12 19 26 33 40 47 54 61 68 75 78 71 64 57 50 43 36 29 22 15 12 19

Ask whether anybody now knows the secret of your friend's number pattern. Allow some discussion. If no learner comes up with the solution, you may tell them: You friend only uses the numbers between 10 and 80 and the pattern goes up and down in steps of 7, "bouncing back" against 80 at the top and 10 at the bottom.

Ask learners to write down the first 25 numbers in your friend's pattern, if the first number is 15 instead of 12, but the step size is 7 again and the boundaries are 10 and 80 again. While they work on this, write the task below on the board. Then circulate between the learners, to ensure that they did the above task correctly, before you point them to the task on the board.

The correct answer for your friend's sequence, starting at 15 is: 15 22 29 36 43 50 57 64 71 78 75 68 61 54 47 40 33 26 19 12 15 22 29 36 43 (Note that the sequence repeats itself after bouncing off the lower boundary 10.)

This is the task you have to write on the board:

Up and down patterns.

Write the first 25 numbers of each of the following up and down patterns, using a step size of 8 in all cases.

Pattern A: The boundaries are 250 and 370. The first number is 255.
Pattern B: The boundaries are 350 and 462. The first number is 353.
Pattern C: The boundaries are 450 and 522. The first number is 456.
Pattern D: The boundaries are 550 and 634. The first number is 559.
Pattern E: The boundaries are 650 and 776. The first number is 657.
Pattern F: The boundaries are 649 and 775. The first number is 654.
Pattern G: The boundaries are 749 and 833. The first number is 752.
Pattern H: The boundaries are 848 and 932. The first number is 851.
Pattern I: The boundaries are 550 and 670. The first number is 558.
Pattern J: The boundaries are 653 and 773. The first number is 660.

Circulate between learners. Identify those who have finished and let them work in groups of three or four. Ask them to compare the last number of their answers for each of the patterns. If they differ on the last number, somebody has made a mistake. They have to sort out the mistakes. When they all agree on the answers, they should exchange ideas about anything interesting that they have observed while extending the patterns. They should also call you to inform you if they have observed anything that is really interesting. If some groups observe that some of the patterns start to repeat after bouncing, challenge them to find out why this happens in some cases but not in others.

Learners who do not finish the patterns in class should do so for homework.

WEEK 6: DAY 3

Notes to the teacher:

- In the first part of the lesson, learners will continue to work on oscillating sequences.
- In the second part of the lesson, they will practice addition and subtraction bonds by playing the game they know by now.

Resources:

- The sets of number bond cards as used previously.
- A copy of Annexure L for each learner, in case they need it for the number bond game.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1:

You need patterns A to J from yesterday on the board again. Write the last number (the 25th) in each sequence next to the specification. Ask learners to look at their answers and check whether they have the same last numbers as those you have written. If not, they should compare with a classmate to find out where they have gone wrong.

All learners now have to write the first 25 numbers in the patterns A to J, this time for a step size of 6, not eight as on the previous day.

At some stage ask learners to check whether some of the patterns start to repeat themselves at some point while others do not. Ask them to mark the patterns that repeated when the step size was eight and to check whether the same patterns repeat when the step size is six.

If time allows, learners may also make the patterns for step sizes of 5 and 9.

After about 25 minutes, write the following homework task on the board:

Make one up-and-down pattern that repeats itself and one up-and-down pattern that does not repeat itself. Your patterns must be different from any of the patterns you did in class.

Explain the homework to the learners, and then do Activity 2.

ORAL AND MENTAL ACTIVITY

Activity 2:

Let learners play the number bond game, exactly as they did in the previous lesson.

For learners who finish quickly and are now idle, write the following numbers on the board:

4 10 15 19 22

Ask learners to write what they think the next ten numbers could be. Ask learners also to explain in writing why they think the next ten numbers should be those they indicate.

Circulate between the learners. Identify those that have finished writing their numbers and their explanations. Group them together (not more than four per group) to discuss their answers and explanations.

WEEK 6: DAY 4

Notes to the teacher:

- In this lesson learners will make a carton tube and use it to draw circles and other round shapes. They will also make a geometric pattern with overlapping circles and use this pattern to draw hexagons and make a honeycomb pattern.

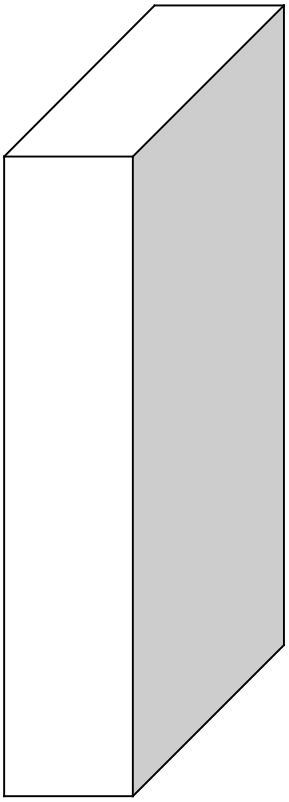
Resources:

- One big empty cereal box for each learner.
- A pair of scissors for each learner.
- At least one stapler, but preferably two or three.
- Sticky tape or masking tape if available.
- Three clean A4 sheets for each learner.
- Each learner must have a good pencil.
- A larger carton tube (as described below) for you to draw circles on the board.

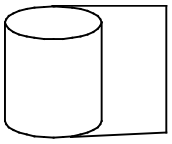
ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

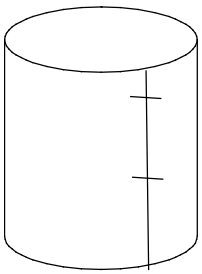
While handing out a pair of scissors and an empty cereal box to each learner, inform the class that they will make a very beautiful drawing by the end of the lesson. The drawing will look a bit like a honeycomb and you may show them the pictures of honeycombs given at the end of this lesson plan.



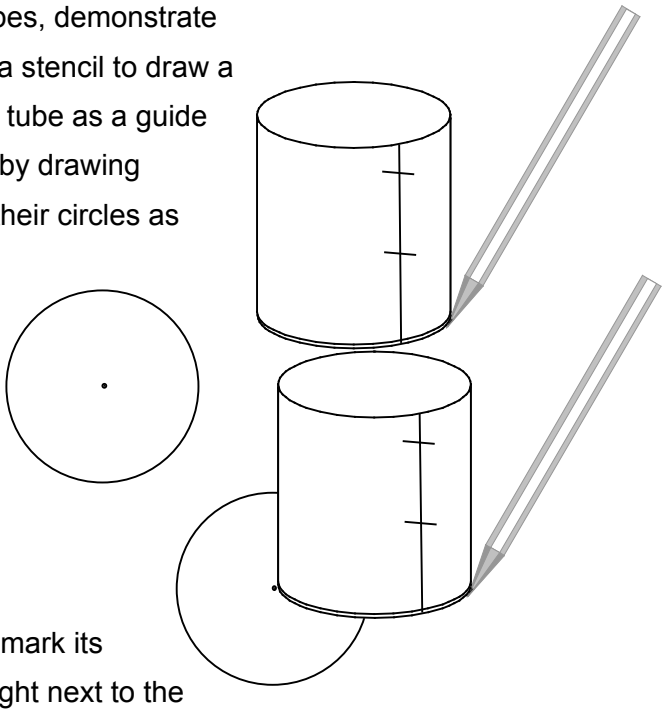
- Learners have to cut out one of the long narrow faces of the cereal box, so that they get a rectangular strip of carton. They have to cut neatly, close to the edge and make the cut as straight as they can. Things may proceed more smoothly in class if you do a demonstration first. Learners should then roll the strip into a tube. The tube should be about 5 cm wide (four grade 4 fingers). The surplus carton should be cut off. Once a learner has a nice tube, he/she should bring it to you so that you can staple it, to make the tube permanent.



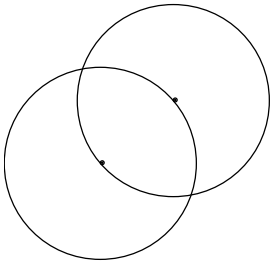
- Put two staples into each tube, in positions as shown on the right. As learners have their tubes stapled, tell them to go and use the tubes to draw nice round shapes on a sheet of paper. If you have more than one stapler, ask some learners with “smart hands” to help with the stapling.



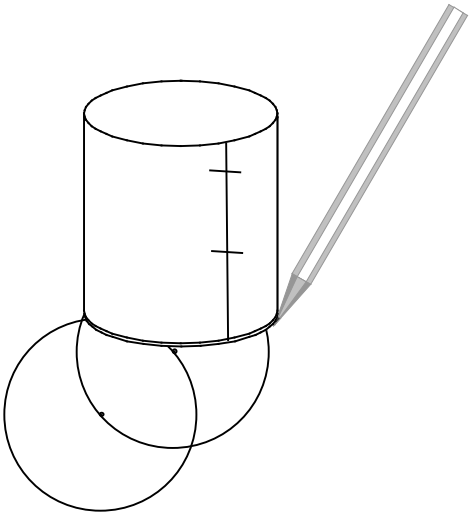
- When all the learners have their stapled tubes, demonstrate on the board how one can use the tube as a stencil to draw a nice circle, by using the bottom edge of the tube as a guide for the pencil tip. Allow learners to practice by drawing several circles, urging them to try to make their circles as neat and round as possible.

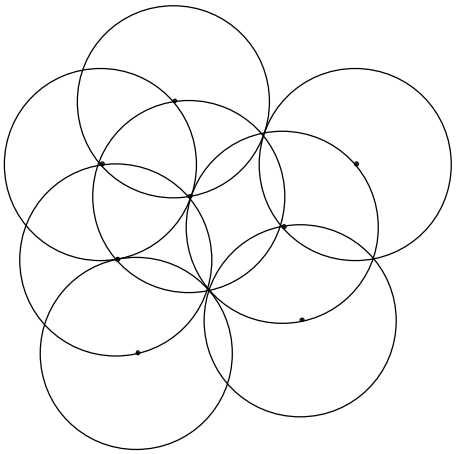


- Ask learners to mark the point right in the middle of one of their circles, and mark it on a circle you have drawn on the board with your large tube.
  Ask them to mark the midpoints of all their circles.
- Ask learners to now work on a clean page, draw a circle in the middle of the page and mark its midpoint. Then ask them to put their tube right next to the midpoint and draw another circle, as shown on the right. Demonstrate this on the board, and give learners time to do it themselves. The midpoint of the second circle should also be marked.

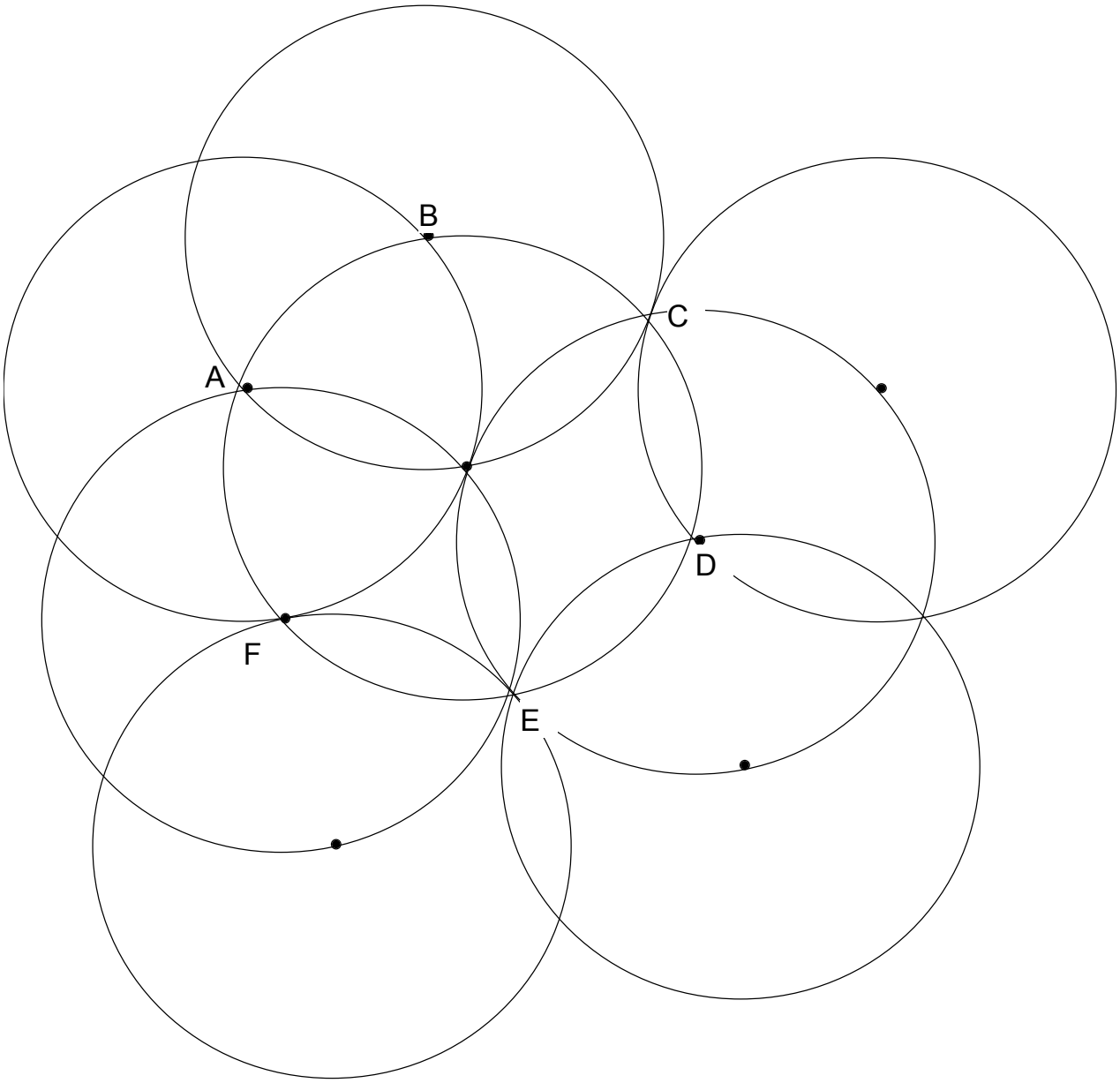


- Ask learners to now put their tube next to midpoint of the second
- circle, and to one of the points where the circles cross each other,
- as shown below, and draw another circle from there. Demonstrate this
- on the board. Continue like this, to make a pattern as
- shown below. **For homework**, learners have to fill a page with the pattern, so that it looks like the the third page from this one, which you may show to them.





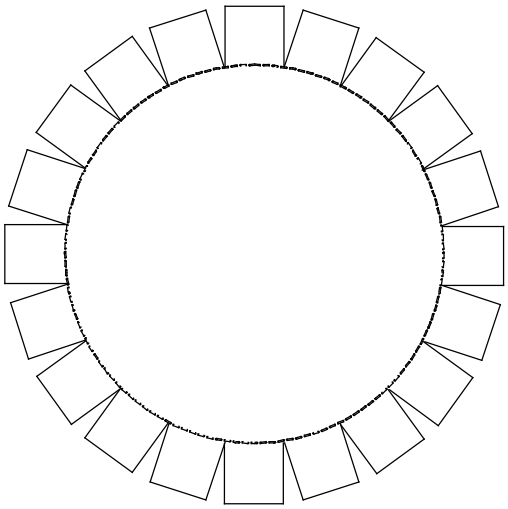
Ask learners to mark certain points where circles cut each other with letters, as shown here, by doing this on the board.



Ask learners to use their rulers to draw a line from A to B, B to C, C to D, D to E, E to F and F to A. Demonstrate on the board if necessary.

Tell learners that the figure that they have now formed is called a hexagon or “six-gon” and the word “hexagon” means it has six corners. Ask them to now also draw a triangle (“three-gon”) and rectangle (“four-gon”), which are faces of the prism and pyramid they have previously made.

If there is time left, learners may make caps for their tubes, so that they can make a cylinder. A cap for a tube can easily be made from paper, by drawing a circle with the tube and adding flaps to it, for example as indicated below. The drawing and cutout need not be precise to make a good cap.



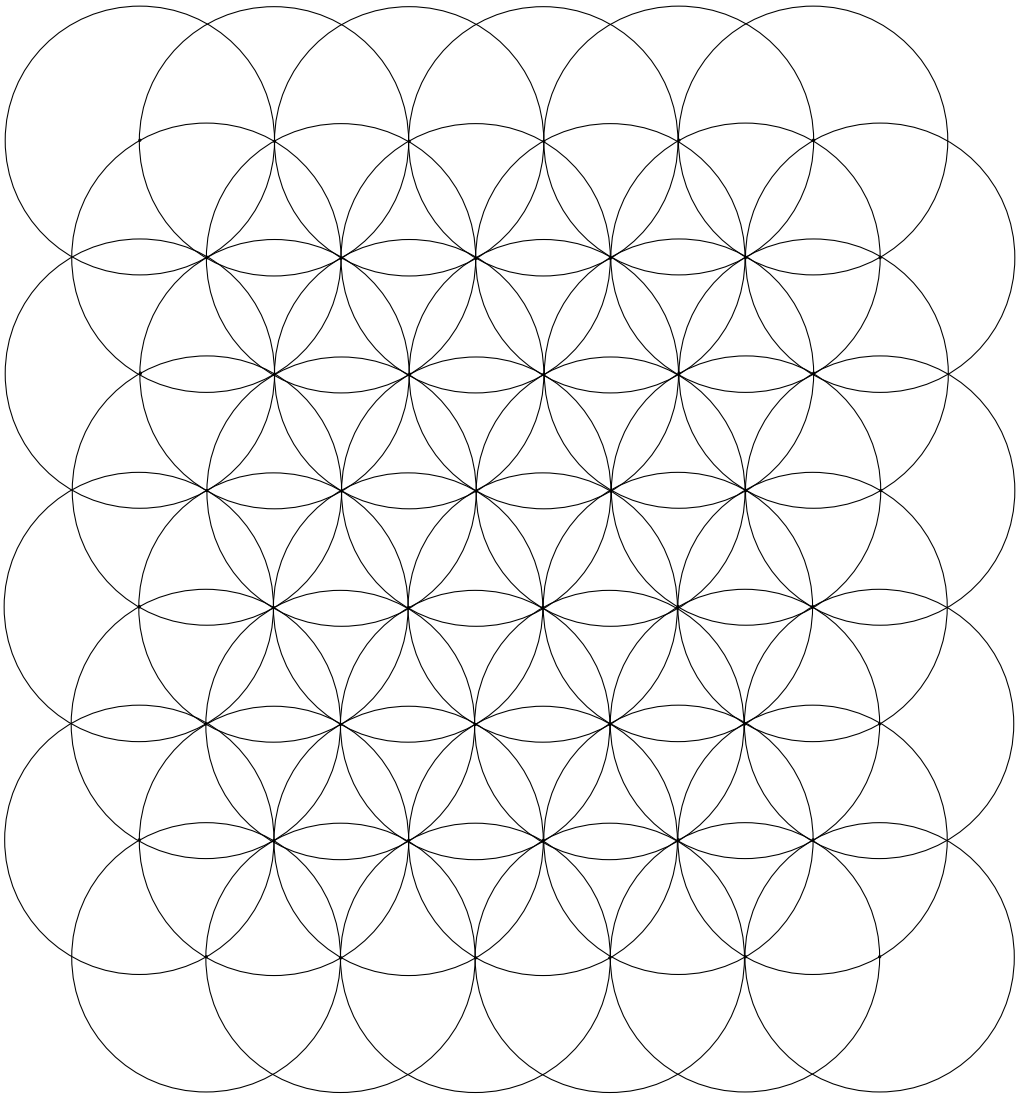
Once learners have made two caps and placed them on their tubes to make cylinders, you may ask learners to compare the cylinders with the rectangular prisms and pyramids they have made in a previous lesson.

Ask the following questions:

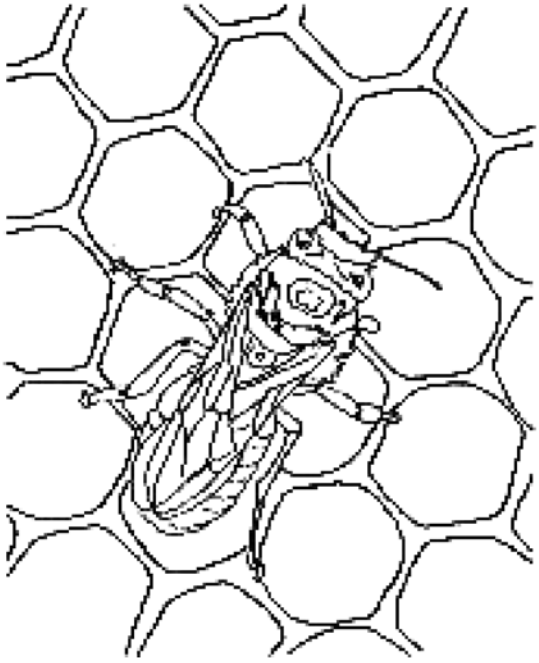
How many faces does a cylinder have? What are the shapes of these faces?

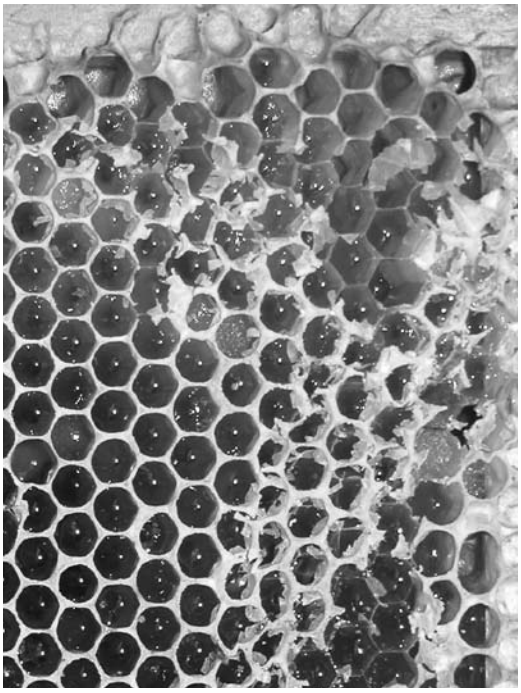
This may result in considerable discussion as one of the faces of the cylinder is not flat but curved!

Learner's tubes and caps should be stored with the other objects they have made in previous lessons. However, they will have to take their tubes with them today, to do their homework (making sheets with intersecting circles). Tell learners that they have to bring their tubes back to school tomorrow.



Pictures of honeycombs





WEEK 6: DAY 5

Notes to the teacher:
- In Activity 1, learners will learn multiplication facts.
- In Activity 2, learners will make up and down patterns again, like in the lesson for Week 6, days 2 and 3.

Resources:
- A copy of Annexure R (eight sheets with bunches of bananas) for each learner
- A copy of Annexure S (multiplication worksheet 1) for each learner
- The sets of number bond cards as used previously.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Take in the homework from the previous day (the sheet with intersecting circles).

Activity 1

Hand out copies of annexure R to each learner.

Ask learners to determine how many bananas there are on each of the sheets.

When they have finished, they should compare their answers.

Hand out copies of multiplication worksheet (Annexure S to each learner.

Read the questions on the sheet with learners.

Learners should tackle the questions individually.

Use the last 15 minutes of the lesson for Activity 2. Write the instruction on the board before this, while learners are still working on the problems.

Activity 2

Let learners write the first 20 numbers of each of the following up-and-down number patterns on a loose sheet. They should do as much as they can in the available time. Take this in for assessment purposes at the end of the lesson. Remember to tell them to write their names on the sheets.

Pattern A: The boundaries are 225 and 370. The first number is 228. The step size is 10.

Pattern B: The boundaries are 371 and 485. The first number is 374. The step size is 20.

Pattern C: The boundaries are 487 and 999. The first number is 492. The step size is 50.

Pattern D: The boundaries are 2 and 1000. The first number is 988. The step size is 100.

Pattern E: The boundaries are 2 and 1000. The first number is 230. The step size is 200.

Pattern F: The boundaries are 230 and 350. The first number is 240. The step size is 100.

Pattern G: The boundaries are 250 and 400. The first number is 287. The step size is 100.

ASSESSMENT	**Formal Assessment:** Activity 2

FIRST TERM: WEEK 7 OVERVIEW

Hours: 5				**Number of periods: 5**	
Learning Outcomes and Assessment Standards LO 1 AS 3, AS 5, AS 6 LO 3, AS 1 LO 5, AS 2, AS 2, AS 4, AS 7			**Milestones:** • Solve problems that involve addition and subtraction, involving money. • Collects data (alone and/or as a member of a group or team) in the classroom and school environment to answer questions posed by the teacher and the class • Recognises, identifies and names three-dimensional objects including: - Cubes and rectangular prisms;		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Addition and subtraction, working with money	Addition and subtraction, working with money	Data collection, representation and analysis.	Data collection, representation and analysis.	Data collection, representation and analysis.
Resources	Fake bank notes (Resource O). Scissors. Cut-out box (Resource P)	Fake bank notes (Resource O).	Chalkboard.	Chalkboard.	Chalkboard.

WEEK 7: DAY 1

Notes to the teacher:

- The money notes will provide learners with another opportunity to develop understanding of how numbers are built up (place value) and what multidigit numbers mean.

Resources:

- Resource O (fake money notes): a copy for each learner and some spare copies.
- A pair of scissors for each learner.
- A copy of Resource P for each learner, to make a flat box container for the money notes, and some spare copies. Resource P will work better if it is printed on stiff paper.
- Glue, for pasting the containers to make them better.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Hand out copies of the four sheets with fake money notes, and a pair of scissors, to each learner. Each learner has to write his/her initials or first or second name on each of the notes before cutting, so that they can keep hold of their own money later on. Learners have to cut out the notes. While learners are busy, also hand out the copies of resource P. Learners who finish before others with cutting the notes, may help to make containers (using resource P) for the others, so that Activity 1 can get done as quickly as possible. Each learner must end up with his/her set of notes and a container.

Activity 2

Learners should work in pairs, or in groups of three. One learner states a three-digit amount, for example *five hundred and eighty-seven rand.* The other learner (or the other two learners) have to make up this amount of money from their notes, in four different ways, for example:

R500 + R80 + R7
R200 + R300 + R50 + R30 + R4 + R3
R100 + R400 + R20 + R60 + R1 + R6
R100 + R100 + R100 + R100 + R100 + R40 +R10 +R10 + R10 + R10 + R2 + R5

The learners should check together whether the different representations show the same amount, and that it is the amount stated by the first learner.

Each learner should then write a report of the work in his/her classwork book, indicating the numbers only (not the money to which it refers), for example as follows for the above case:

500 + 80 + 7 = 200 + 300 + 50 + 30 + 4 + 3
= 100 + 400 + 20 + 60 + 1 + 6
= 100 + 100 + 100 + 100 + 100 + 40 +10 +10 + 10 + 10 + 2 + 5

Another learner then gets the opportunity to nominate an amount.

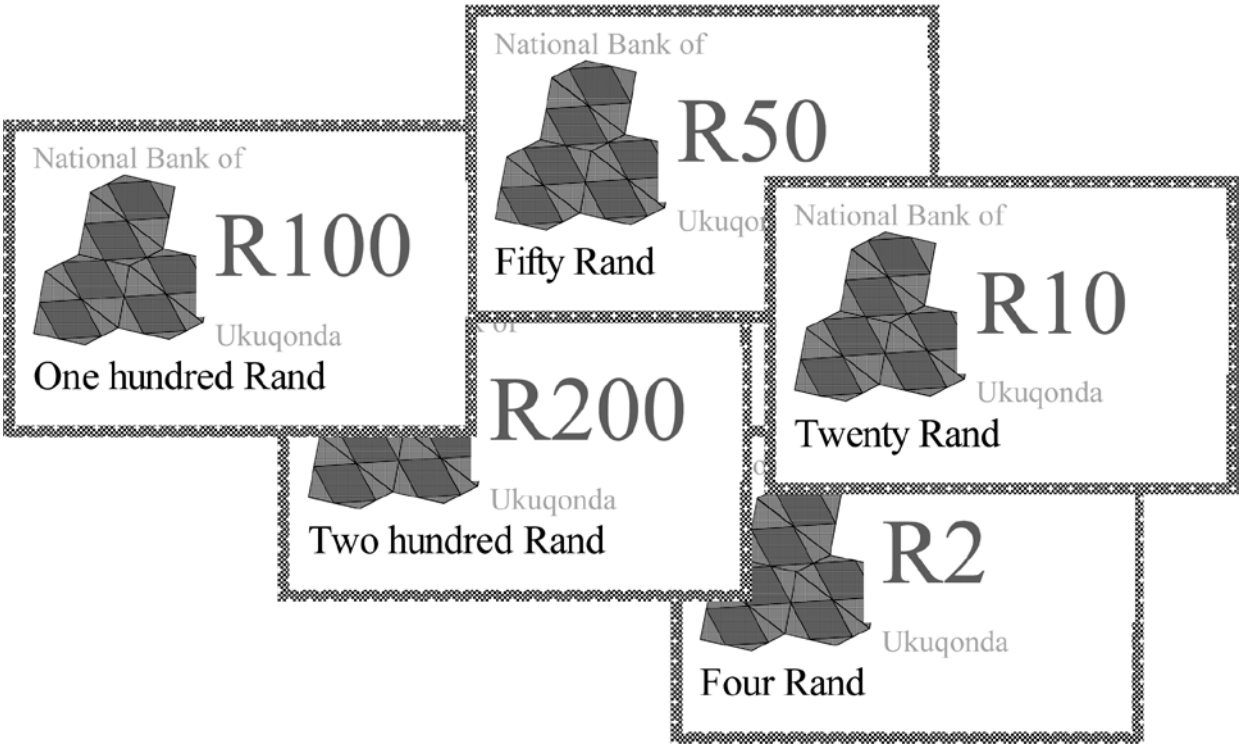
Circulate between the learners and check as many reports as you can. Where there are mistakes, point this out to learners by saying *"This is not true, you must correct it!"* They should then interrupt what they are busy with, to first correct the work with mistakes. They should call you when they have corrected, so that you can check again.

Activity 3

There may not be time for this activity in this lesson. However, you can use this activity on any other day, when time is available, and ypou may use it more than once.

The learner has to choose any amount between R500 and R800, for example R638. The learner has to imagine that this is the cost of something he or she bought at a shop. The learner also has to imagine that he/she pays with a R1000 note.

Then the learner has to give change with the fake money notes, by packing out the change. In the case of a purchase of R638 the change may look like this:



The learner should then express the total amount of change with a single number.

The learner should write down his/her thoughts to figure out what notes to use for change. To help them to do this, you may first let them explain to each other how they thought, so that they are forced to clarify their own thinking to themselves.

Finally, the learner should write a report in the form of a number sentence, for example:

R1000 – R638 = R362.

WEEK 7: DAY 2

Notes to the teacher:
- Learners will work at problems.

Resources:
- The fake money notes (Resource O) for each learner.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1

Learners have to work individually, and they may use their fake money to help them.

Tell them that you have bought new clothes for R846, but that you can pay only R378. Your husband (wife, mother, whichever relative you are comfortable to mention) has agreed to pay the rest. Each learner now has to work out how much your relative must contribute. Learners should make notes of the amounts you have mentioned, rather than you writing it on the board. Tell learners that they may use their fake money notes to help them, if they wish.

Leave the learners for at least five minutes, to ensure that they understand that they are on their own now and should tackle the problem on their own initiative. Then start circulating between, and observe what they do. If there are learners that seem not to get started, you may suggest to them that they display the total cost of the clothes with fake money notes. You may also remind them that they can display the cost in different ways with the notes. This may help them.

Some learners may try to represent (or "pack out and repack") the R846 in such a way that they can "see" the R378 as part of it, for example by thinking as indicated below (learners may however represent this thinking quite differently than here).

R800 + R40 + R6

R400 + **R300** + **R70** + R30 + R30 + **R8** + R2 + R6

R400 + R30 + R30 + R2 + R6 must still be paid, that is R468

Other learners may adopt a "filling up" strategy, by investigating what they must add to R378 to get R846. They may do this by working with the fake notes to support their thinking, or by working directly with the numbers, for example like this:

R378 + **R22** = R400 R400 + **R446** = R846 R446 + R22 = R468

Some learners may record this thinking as R378 + **R22** = R400 + **R446** = R846.

While the above *thinking* is mathematically 100% correct, this way of *writing* is misleading and ambiguous and should be avoided. It is not true that R378 + R22 (i.e. R400) is equal to R400 + R446 (R846). You may help learners who think and write like this enormously by suggesting that they use an arrow instead of an equal sign to represent their thinking:

R378 + **R22** → R400 + **R446** → R846

A third strategy ("take away") that learners may follow is to start with the total cost (R846), and to find out how much remains if the R378 is taken away from it. Again learners may or may not use the fake money notes to support their thinking. This strategy may be implemented in different ways, two of which are demonstrated below:

Take the R378 away piece by piece from the R846:

R846 – R6 → R840 – R2 → R838 – R30 → R808 – R8 → R800 – R30 →
R770 – R2 → R768 – R300 → R468

Break both the R846 and R378 down and take parts away from parts:

R846 = R800 + R40 + R6

R378 = R300 + R70 + R8

To make it possible to take parts away from parts, it helps to rebuild the R846 as follows:

R846 = R700+R130+R16, then

R700 – R300 = R400

R130 – R70 = R60

R16 – R8 = R8, and the answer is R400 + R60 + R8 = R468.

All the above methods are mathematically quite correct. The "filling up" method is the quickest and easiest. The "break both numbers down and take parts away from parts" provides the mathematical basis of the conventional column method.

Identify learners that have finished, and assign them to groups of four or three learners to tell each other about their methods. As far as possible, put learners who used different strategies in the same group.

Write the following task on the board, so that groups of learners who have finished discussing their methods for the first problem, may tackle the next problem (individually). Suggest to these groups that they go to the board to read and discuss the new situation, before they return to their desks to work individually. **It is very important that learners tackle problems individually, otherwise some learners never learn.**

The principal of a school knows that there are 912 learners in the school. One Sunday there was a terrible storm. On the Monday morning at 10 o'clock, only 567 learners have arrived at the school.

How many learners did not come to school that morning?

Identify learners that have finished with the second problem as the lesson period moves on, and again assign them to groups of four or three learners to tell each other about their methods, **and also about any changes in their strategies**. As far as possible, put learners who used different strategies in the same group.

When there is about 20 minutes of the lesson period left, demonstrate the "pack out and repack" and "filling up" strategies for the first problem on the board, with some reference to learners who have used these methods. If several learners have used other methods and there is still time left, you may also demonstrate the other methods.

WEEK 7: DAY 3

Notes to the teacher:

- Over the next three days, learners will be working in groups to decide the kinds of foods they would buy from a school tuckshop. They will decide on the data they require, prepare questions and then actually go and speak to fellow learners to collect the data. They will then display the results using tallies and draw conclusions from their results. This lesson serves as revision of using tallies for counting, as well as interpreting data collected using tallies.
- They will work in groups today to pose the questions, decide a set of questions as a class and then collect data. You will need to get permission to disrupt other classes in the school in order to get their information.
- Each group of learners will ask the opinion of a different grade of learners within the school. Each group will also be broken into smaller groups so that two or three learners will go to each class in the grade.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Explain to learners that they are going to plan a menu for their school tuckshop. If the school does not have a tuckshop, tell learners that they must either imagine that their school is going to open one and they have to plan the menu, after talking to fellow learners; or if they have a food vendor near their school, they must find out from learners what they would like her to sell if they could choose a menu.

Divide the class into groups: there must be 1 group to represent each grade in the school). Together the group will decide on the items (restrict it to 4 at the most) that they would like to buy at their tuckshop. Give learners time to complete this task and then ask each group to tell you their 4 items. Write the names of these items on the board and the 4 or 5 most popular items will become your main list. Learners will now draw the table will keep a record of their results on this table. Tell each group which grade they are going to question. Divide each group into smaller groups so that only 2 or 3 learners will do the questioning. At the time you have arranged with the other teachers in the school, learners will go and find out how many learners in their assigned class would like to buy the items on the list.

Learners must keep a separate record of the choice made by boys and girls in the class. They can record the numbers using individual tallies in their own jotters. They will work with these results during the next lesson. A list may look like the one on the next page: (Note: this is a sample only and each class of learners will need to make their own decision on items.)

Item	Number of orders
Chicken soup Boys	
Chicken soup Girls	
Grilled chicken Boys	
Grilled chicken Girls	
Hamburgers Boys	
Hamburgers Girls	
Bran muffins Boys	
Bran muffins Girls	

As learners ask the other learners if they would buy the items on their list, they record the positive responses using tallies. Check their books when they come back to your class, to make sure that they have actually completed the task set.

WEEK 7: DAY 4

Notes to the teacher:

- Today learners will work in their groups to consolidate the information from their books onto a large chart.
- Each group will answer a set of questions related to their tallies and grade questioned.
- You will need to prepare questions to ask the learners, related to the data collected. This will help them interpret the data on their group chart in preparation for the final whole class discussion and drawing final conclusions.
- Ensure that the charts are large and clearly filled in, as the whole class will refer to these in the next lesson.

Resources:

- Jotters with the results of the questioning from the previous day and to record answers to questions from this lesson.
- Large sheet of paper to display final tallies for the group.
- Set of questions either written on the board or a copy for each group.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Hand out the large sheets of paper to each group for them to put all their data together to see the choice made by the whole grade. Tell learners that the charts must be neat, clear and able to be seen by the whole class. Learners must copy their original table onto the large sheet of paper (making it as big as possible). The small groups of learners then report back to the rest of their group and tell them the numbers of each item chosen by each class in the grade. They must then transfer the information from their jotters onto the large chart, using tallies.

Once learners have transferred all the data from their sheets onto the large chart, they must work as a group to discuss and answer the questions you have set. Hand out the worksheets or write the questions on the board. Read these aloud with the learners following as you read, so that the learners understand what is expected of them. While learners are completing this task, you need to walk between the groups and talk to them about the questions they are answering. Ensure that they understand the questions. The questions must challenge learners to think about the results, calculate total numbers and compare results. For example (this is a sample only – you will need to add more questions of your own):

- Begin with learners adding the numbers of each section/item of the chart, i.e. boys, girls
- Then learners add the total number of learners that would buy each item

Now ask questions that challenge learners to compare the data and draw conclusions from it, e.g.

- Will more or less boys than girls buy chicken pieces and by how many?
- Do boys prefer muffins to chicken pieces? Why do you think this is?
- Why do more girls want to eat muffins than hamburgers?
- Who would buy more from the tuckshop overall? Boys or girls?
- Do you think the type of food on the list makes a difference?
- Which item would you replace and why? What would you sell in its place?

Learners will use this information in the class discussion in the next lesson.

WEEK 7: DAY 5

Notes to the teacher:

- Today learners will collate their data.
- Learners calculate the total number of boys, girls and both, throughout the school, that would buy each of the items.
- Learners answer questions that lead them to conclude which items will be the most and least popular with boys, girls and both together throughout the school.
- Learners discuss why they think certain items would sell better to boys rather than girls and vice versa, why some items are generally more popular than others and with whom, etc.
- Learners will compare the items chosen by the different grades in the school.

Resources:

- Set of questions that will lead learners to drawing conclusions from the data collected.
- Charts drawn up by each group from previous day.
- Jotters used for answering questions in previous lesson.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Let one learner from each group come up to the board and display their large chart from the previous lesson. Point to each chart and direct learners attention to each chart and the grade it represents. As you point to each chart, ask learners to tell you the most popular and least popular items for that grade (do not ask the group that drew up the chart).

Learners will work in their groups and calculate the total number of boys, girls and then the total number of learners (in the whole school) that would buy each item. Remind them that they now have to work from all the charts. Learners will work in groups of four and by answering set questions, they will be able to draw conclusions from the charts. Remind them that when they answer the questions, they need to count ALL the boys in the school that would buy hamburgers etc.

- Will more or less boys than girls buy chicken pieces and by how many? Look at your answer from the lesson before. How does it differ now that you are counting the votes of the whole school? Why do you think this happened?
- Do boys prefer muffins to chicken pieces? Why do you think this is?
- Why do more girls want to eat muffins rather than hamburgers?
- Who would buy more from the tuckshop overall? Boys or girls? Compare your results from the lesson before. Is it still more/less boys? Why do you think this is so?
- Do you think the type of food on the list makes a difference when the whole school has chosen? Why do you think so?
- Which item would you replace and why? What would you sell in its place?
- Look at the number of hamburgers that were chosen by Grade 2 learners compared with Grade 7 learners? Which grade chose more hamburgers? Why do you think this is so?
- Look at all the girls' totals. Which grade would buy more chicken pieces? Why do you think it is so?

When learners have completed the task, join two or three small groups together. Let them discuss their answers, taking note of the items that they need to replace and the items they choose to replace these with.

FIRST TERM: WEEK 8 OVERVIEW

Hours: 5					**Number of days: 5**
Learning Outcomes and Assessment Standards LO 4 AS 5			**Milestones:** • Estimate, measure, record, compare and order 2-dimensional shapes and 3-dimensional objects using SI units with appropriate precision for length (millimetres, centimetres and kilometres) • Solve problems involving selecting, calculating and converting between appropriate SI units listed above.		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Finding objects to measure in mm Measuring lines in mm Converting between mm and cm measurements	Consolidation of measuring lines in mm Converting between mm cm Rounding off to the nearest cm and the nearest m Solving related problems where rounding off is used Compare with real totals	Expressing half-metres and half-centimetres in decimal notation. Counting backwards and forward in 0,5 m and 0,5 cm measurements Solving word problems	Introducing kilometers Converting between km and metres Expressing fractions of a km in metres and ½ km as 0,5 km Solving related word problems	Assessment Activity Measuring outside distances in strides measured in cm lengths, converted to m/cm using a calculator Checking and comparing same distances with a trundle wheel
Resources	Metre stick, rulers, matchboxes small objects to fit into match boxes, worksheet with lines to measure or similar examples from textbooks.	Metre stick, rulers and worksheets.	Copies of worksheets, practice examples.	Copies of worksheets; exercises from textbooks; examples of maps giving distances in km.	Tape measures, recording sheets, trundle wheels.

WEEK 8: DAY 1

Notes to the teacher

- Learners are again (as in Week 5) confronted with the problem of measuring a length, when the unit of measurement does not fit precisely, as shown on the sketch below. They are then introduced to fractional parts of a metre, as a way to solve this problem. Learners are introduced to tenths, hundredths and thousandths of a metre, in other words decimetres, centimeters and millimeters.

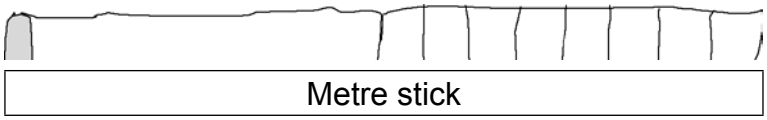
Resources:

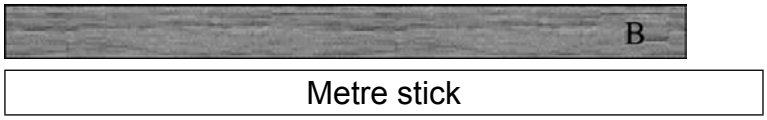
- An ordinary ruler for each learner.
- Several carton metre sticks for yourself, some not subdivided, others subdivided into decimetres (see diagrams below).
- A copy of Annexure V for each learner, and scissors.
- A drawing of three objects (e.g. planks or brooms or tables), 1 metre and 0,9 metre and 0,83 metre (83 cm) long respectively, on the board. You may also have three actual objects to measure.
- Copies of the longer ruler and the stickruler on Annexure V for yourself, to use on the board.

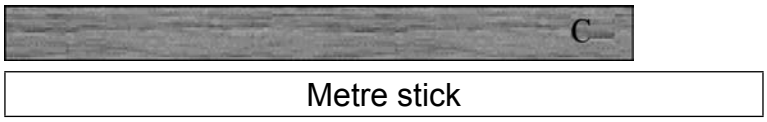
ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1







Demonstrate on the board that some objects can easily be measured accurately with a metre stick, but others not. For the second and third objects above, ask learners to describe what the problem is. Also ask them to suggest how the problem may be solved. They may or may not come up with the idea of subdividing the metre stick into smaller parts.

Now show learners that if the metre stick is subdidvided into ten equal parts, the second object can be accurately measured, but not the third one.



Inform learners that tenths of a metre are called decimeters. The Latin prefix *deci-* means tenth. The length of the object B can be describe as 9 decimetres or 9 tenths of a metre or 0,9 metre.

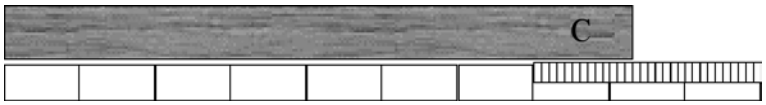
Confront the learners with the fact that it is is till a problem to measure object C accurately. Ask them if they can think of a plan, and to discuss this with each other.

While learners talk, hand out copies of Annexure V and scissors.

Activity 2

Let learners cut out the long ruler that lies diagonally on the sheet (Annexure V), as well as the short stickruler.

Demonstrate on the board that a STICK is the same as a decimeter. Also demonstrate how object C can be accurately measured, by using your copy of the long ruler on Annexure C in conjunction with the metre stick divided into tenths.



Confront learners with this question:

One STICK is the same as one decimeter and that is one tenth of a metre.

What fraction part of a metre is each of the 30 subdivisions on the ruler they have cut out?

Give learners some time to reflect on this and discuss it in small groups.

Then inform them that the 30 parts on the ruler are called centimeters. Each of them is one hundredth of a metre, and the Latin for “hundredth’ is *centi*. So “centimeter” and “one hundredth of a metre” are the same.

Activity 3

Learners measure the pencils A to E on Annexure V. To measure D and E accurately, they will need the smaller subdivisions. Do not tell them immediately that these are millimteres, they should first figure out that these are tenths of centimeters, and indeed thousandths of a metre.

WEEK 8: DAY 2

Notes to the teacher:

Learners use what they know about rounding off whole numbers to rounding off measurements of length given in centimeters and metres. They use rounding off as a strategy for estimating totals and then compare the estimate to the accurate measurement. Learners complete a written activity on measurement which forms part of Assessment Task 2 for Term 1.

Resources:

- Metre stick
- Rulers and worksheets
- Copies of Annexure 4 (or a similary assessment activity)

ACTIVITIES FOR THE DAY

MENTAL ACTIVITY (5 minutes)

- Say or write numbers on the board that learners must round up or down to the nearest 10:
  34; 145; 23; 17; 892; 69
- Next give examples where they round off to the nearest 100:
  45; 134; 78; 190; 225; 45; 235
- And then to the nearest 1 000:
  450; 567; 789; 211; 901; 499

Review homework (5 minutes)

Let learners swap books with a partner to check and correct one another's homework.

CONSOLIDATION (10 minutes)

Draw some short lines on the board in different orientations. Make some of the lines equal lengths. Ask learners to estimate and order the lines from shortest to longest, say if any lines are the same length, and estimate the lengths in mm. Ask some learners to help you measure the lines with your metre stick. Write the measurements in mm, and ask them how we convert them to cm/mm lengths.

CONCEPT DEVELOPMENT: (20 minutes)

- Talk about situations when it is important to be 100% accurate when measuring and when an estimated or rounded off measurement might be more useful. Give examples like:
  - *estimating* the distance from the classroom to the field;
  - *measuring* the distance around the classroom walls to buy wood for skirting boards;
  - cutting a length of string a metre long to use as a *measuring* tool;
  - *estimating* your leg length to see if a pair of trousers at the store will fit you or not.

  Let learners add other situations to these.
- Using your metre stick, show learners a measurement of e.g. 67 cm. Revise the practice of rounding off cm measurement to the nearest whole cm using the 0,5 cm mark as a guide. Do some practice examples together like 45 mm; 43 mm; 279 mm; 181 mm to the nearest cm. Stress that they must only consider the value of the last digit.

- Next give examples where learners must add and round off cm amounts to estimate a total and then add to find the real total and compare the two.
  Introduce the sign we use for rounding off: 59 cm ≈ 60 cm.
  Example:
  34 cm + 56 cm + 89 cm + 92 cm = ____ Rounded off total: 30 + 60 + 90 + 90 ≈ 270
  Actual answer: 271
- Include examples of word problems. For example:
  A saleslady sells six pieces of a ribbon in a morning. She does a quick estimate of how much ribbon she sells by rounding off the amounts before adding them. Show how she does this. The amounts are 33, 25, 51, 82, 98 cm.
  Rounded off total: 30 + 30 + 50 + 80 + 100 ≈ 290 cm
  Actual answer: 289 cm
- Next introduce rounding off cm lengths to the nearest metre. From rounding off numbers to 100, learners should work out that we round measurements above 50 cm, to the nearest 1 m, and numbers below 50 cm down to the lower measurement. Use two examples to demonstrate: 1 m 67 ≈ 2 m and 1 m 31 ≈ 1 m.
- Then introduce realistic contexts where rounding may be used. For example:
  A carpenter orders these lengths of wood: 1 m 21 cm; 3 m 56 cm; 4 m 67 cm; 4 m 28 cm.
  Use rounding off to metres to estimate the total length before calculating the total.
  Rounded off total: 1 m + 4 m + 5 m + 4 m ≈ 14 m
  Actual answer: 13 m 72 cm

WRITTEN ACTIVITY (20 minutes)

Follow up by giving learners a written activity which you can use for assessment (annexure 4 gives an example of the type of written work to be done, or you can use similar examples from your textbooks). The focus should be on converting measurements and using rounding off as an estimating tool.

WEEK 8: DAY 3

Notes to the teacher:

This lesson is a revision and consolidation of the very important work that was done on the previous day.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Use your metre stick in this activity. Ask learners questions like:

- *How many 10 cm **parts** is the metre stick is divided into? (10)*
- *What **fraction** is the metre stick divided into? (tenths).*
- *How many cm in one tenth of a metre? (10 cm)*
- *How many cm in 5 tenths of a metre? (50 cm)*

Draw and measure a line of 50 cm on the board. Talk about three different ways that we can write the measurement – as 50 cm, half a metre or as 0,5 m. Now draw two more lines that measure 1,5 m and 2,5 m. Ask learners to say three different ways we can write the same measurement. Give further practice with measurements that include half a metre which they say in three different ways.

Make up a worksheet like this or find similar practice examples from learners' textbooks to follow up with written practice:

Number of centimetres	Metres and fractions of a metre	Decimal notation
50	Half a metre	0,5
150		
450		
350		

Ask similar questions to build learners' understanding that:

1 mm is one tenth of a cm;

5 mm is five tenths of a cm or half of a cm and that we can write this in decimal form as 0,5 cm.

For example:

- *How many mm in 1 cm? (10)*
- *How many tenths of of a cm in 1 cm? (10)*
- *What fraction of a cm is 1 mm? (one tenth)*

- Let learners complete a similar table, but this time writing mm measurements as fractions of a cm.

Number of mm	Metres and fractions of a metre	Decimal fraction
5 mm	Half a cm	0.5 cm
15 mm	One and a half cm	1, 5 cm
65 mm		

PROBLEM SOLVING

- Give learners a mixture of word problem types where they have to use different operations with measurements that include 0,5 m amounts. Decide on how many problems they can get through in the time available. Here are some examples:
  a) Rulani is 1,5 m tall. His baby sister is 50 cm tall. What is their combined height?
  b) There are two trees in the school garden. The first one is 3,5 m. The second tree is 0,5 m shorter. How tall is the second tree?
  c) A building is going up in town. It is going to be 14,5 metres high. So far it is 7,5 m. How many more metres to go?
  d) A roll of wire is 45 m long. 17,5 metres of the wire are sold. How much wire is left on the roll?
  e) In a straight line, from the school gate to the hall is 20,5 metres. From the hall to our classroom is a further 13,5 m; from our classroom to the toilet is a further 12 m. What is the distance from the school gate to the toilets?
  f) A farmer plants 15 cabbages in a row, 0,5 m apart. How long is the row?

Take in learners' work to mark. Record comments in your observation schedules on how individual learners manage the task. Focus on how they deal with measurement concepts **and** how they apply their number skills to solve the problems. For example, do they use calculation methods that make sense for the given problem? Can they show their working out in clear, communicable ways to produce correct solutions?

WEEK 8: DAY 4

Notes to the teacher:

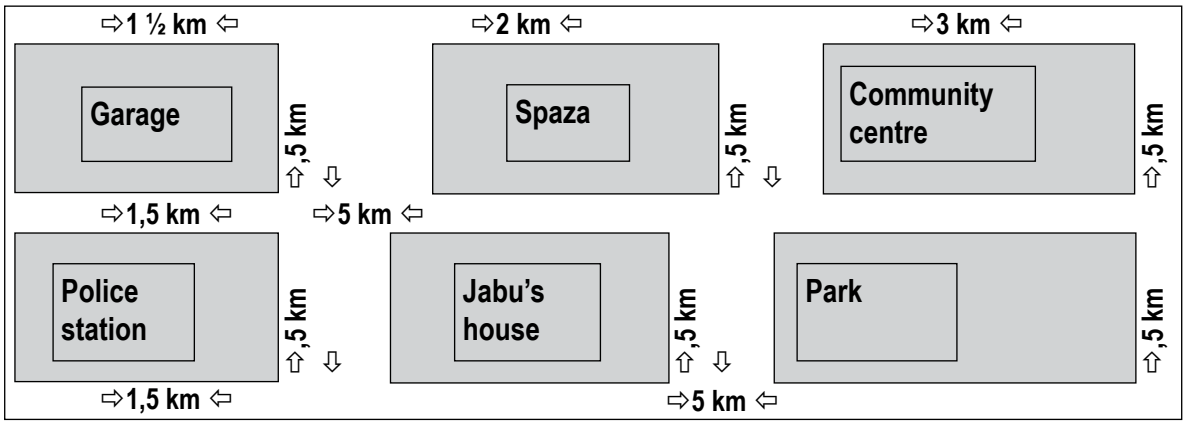
By now the learners have estimated, measured and converted measurements given in centimetres and millimetres. We now introduce them to kilometres, which they are likely to have read about and heard of, but do not necessarily know how long a kilometre is and how many metres there are in one kilometre. They apply what they learned about converting fractions of a metre to cm to converting fractions of a km to m and to express ½ km as 0,5 km. They then solve word problems choosing different calculation strategies to add and subtract in km and m.

Resources: Copies of worksheets and examples of maps showing kilometres in distances.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

- Ask learners to say how we measure distances between towns or cities. They will probably say in kilometres, rather than in metres. Write the word kilometre on the board, with the symbol km next to it. Ask if they know how long a kilometre is. Give them a clue by telling them that the 'kilo' part of the word means 1 000. Once they've worked this out, write 1 km = 1 000 m. Now ask them to try and imagine distances from home or from school that are about 1 km long. Make time for learners to share their ideas.
- Use an example of a simple map like this street map, with distances written in. You can find a similar example in most textbooks.



- Name two landmarks on the map to describe the beginning and end of a journey. For example, from the Garage to the Park or from the Community Centre to the Police Station. Learners must describe the routes they take and calculate the distances covered.
- Look for a section from a map of South Africa that has km distances written. Ask learners to work out distances between towns and cities to find two different routes to get from A to B and then calculate and compare the distances in km.
- In Week 4, learners worked out how many cm there were in different fractions of a metre. They now know that 1 000 m is the same as 1 km. Let them work with a partner or in small groups to work out how many metres in different km amounts, expressed as fractions. For example: half, quarter, three-quarters, one tenth, three eighths oif a km.

- Now ask them to think back to how they wrote half m as 0,5 m or half cm as 0,5 mm and say how they would write one tenth km or 100 m in the same way. (0,5 km)
- Give them some written practice where they use decimal fractions to write and convert 5 km amounts and convert between km and m. Find more examples in your textbooks.

1. *Example: 0,5 m = 500 m*

a) 1,5 km = _____ m
b) 3,5 km = _____ m
c) 1 500 m = _____ km
d) 2 500 m = _____ km
e) $4\frac{1}{2}$ km = _____ m
f) 6,5 km = _____ m

2. *Example: 1 km 300 m = 1300 m*

a) 3 km 470 m = _____ m
b) 4 300 m = 4 km 300 m
c) 9 km 170 m = _____ m
d) 6 027 m = _____ km _____ m
e) 4 km 121 m = _____ m
f) 2 401 m = _____ km _____ m

PROBLEM SOLVING (20 minutes)

- Do an example together of a word problem that involves adding/subtracting in km and m which can be solved using different methods. Learners discuss possible solutions and you record their ideas on the board. You may end up with two or three different methods all giving the correct answer. Discuss whether one method is better than another method.

Problem: Pinkie and her sister walk a distance of 3,5 km from home to school. So far they have walked 1 km 260 m. How much further do they have to walk?

- Let learners now use these ways as well as choose other ways they may know to solve these problems (or find similar examples in their textbooks).

1. These are the distances covered by two runners in one week:
   1 km 340 m; 3 km 450 m; 4,5 km; 3 km 109 m; 6 km 730m.
   a. How many km do they run altogether?
   b. Their target for the next week is to run 25 km. How much further do they need to run?
2. Pule goes on a hike with his class for 14 km 240 m. They take a rest after 6,5 km. How many more kilometres do they have to walk?
3. A taxi records the distances he covers for 4 out of 5 trips he makes in one morning:
   1 km 450 m; 3 km 30 m; 2,5 km and 7 km 125 m.
   After 5 trips he notices that he has done 21,5 km. What is the distance of the sixth trip?

- Discuss solutions for at least two of the problems. Let the learners you've noticed using different approaches explain their solutions to the rest of the class. Learners who did not finish all three examples can complete the work at home.

WEEK 8: DAY 5

Notes to the teacher:

In Week 4, learners used body measures to estimate different measurements including their strides, but without measuring these in cm. In today's outside activity, they use *measured strides* to approximate distances between two points. They then convert these to m and cm amounts using a calculator and lastly learn how to use trundle wheels to measure longer distances to check the closeness of their approximations.

Resources:

- Tape measures
- Recording sheets
- Trundle wheels *(If there are more trundle wheels in the school, borrow these from other teachers for this activity)*

ACTIVITIES FOR THE DAY

Revision Activity (20 minutes)

1. Rewrite the following in order from shortest to longest:
   a. 6 m 6 km 6 mm 6 cm
   b. 10,5 cm 10 mm 10,5 km 10,5 m
   c. 1 200 m 1,5 km 2 600 m 2,5 km 2 010 m
2. Fill in the missing measurements:
   a. 1 km 200 m = _____ m
   b. 3 m 40 cm = _____ cm
   c. 4 320 mm = _____ cm
   d. 6 075 mm = _____ m _____ cm
   e. 4 and a quarter m = _____ cm
   f. 6 and a half km = _____ m
   g. 129 mm = _____ cm
   h. 3 and three quarters km = _____ m
3. On a stretch of road 5 km in length, there is a sign every 0,5 km. How many signs are there?
4. How many lengths of wood each measuring $\frac{1}{4}$ m can be cut from a plank that is 4 metres long?
5. a. Find the total distance:
   3,5 km + 250 m + 340 m + 3,3 km + 1 012 m = _____ km
   b. Here are some lengths of string. How many **more** cm lengths of string are needed to make 12 m?

   34 cm + 1,5 m + $2\frac{1}{4}$ m + 3,5 m + 2 400 m + 60 mm
6. Round off each measurement:
   a. 45 cm ≈ ____ m
   b. 34 cm ≈ _____ cm
   c. 142 mm ≈ _____ cm
   d. 1 345 m ≈ _____ km
   e. 1 and a quarter km ≈ _____ km

Tip: This can be used as part of Assessment Task 2.

Concept development (40 minutes)

- Take learners outside the classroom to demonstrate how to use a trundle wheel to measure longer distances in metres, as well as to measure distances that do not run in a nice straight path. First 'walk' a distance of two or three metres using your trundle wheel. Explain how, with each click of the wheel, one metre is measured. Let two learners mark your beginning point and end point and then use a tape measure to verify the distance you walked.
- Divide the class into small groups. Each group elects one learner whose stride measurements they use to estimate a distance outside that they choose. For example, from the class to the hall, to the school gate, the distance around the playing field, between trees etc. They will then use the trundle wheel to check the measurements.
- Explain to the learners that they are going to measure the strides of the learners they choose from their group to pace out the distance, but this time in cm. They will then count how many strides he/she takes, multiply this number by the measurement in cm of his/her stride to get an approximate measurement of the distance. Use an example to illustrate this clearly:

  Group A chooses to measure the distance between two trees. They estimate the distance to be 10 m. They choose to use John's stride measurement. They measure it as 39,5 cm and then round this off to 40 cm. John then uses his stride to measure the distance between two trees. The rest of the group count that he takes 18 strides.

  To find the approximate distance, the group uses their calculator to find that 18 x 40 = 720 cm. They convert this to 7 m 20 cm. They use the trundle wheel to check the measurement which they find to be just over 8 m, so they round it to 8 m.
- Give each group a copy of a recording table like this and a tape measure to work with. *(The measurements above are used as an example).*

Distance	**Estimated Distance**	**Length of stride**	**Number of strides**	**Measurement in strides**		**Trundle wheel measurement**
1. From tree A to B	10 m	40 cm	18	**cm** 720	**m/cm** 7 m 20 cm	**m** 8 m
2.						
3.						

- Organise the groups so that they each have a turn measuring with the trundle wheel. While one group is busy with the trundle wheel, other groups can carry on estimating more distances that they can check later when the trundle wheel is available. Learners in the group should have turns pacing out the distances, and measure the new stride measurement each time.
- As they work, move around from group to group. Remind them that it is important that the stride measurements should have no gaps between them or overlaps. Encourage all group members to play a role. After each group has had at least two turns estimating and measuring, bring the class together in a circle to discuss and review the different groups' measurements. Make the trundle wheel available for groups to use during break times or before school so that they can check those distances they were not able to measure during the lesson.

Assessment

- There are a number of written activities this week which can form part of Assessment Task 2 for Term 1.
- In addition, there are many other opportunities for you to assess learners as they work though the practical activities, most of which are done in groups. You can, for example, assess how they work cooperatively as part of a team, if they are able to keep up with the rest of the group, whether learners in the group share responsibilities and whether all contribute to a particular investigation.
- We also suggest that you take in learners' books after Day 3 to mark and check their written work and review how individual learners are coping with the different tasks. Based on this, you might want to decide whether to re-group the learners for the rest of the week into same-ability groups. This will allow you to give those learners who need it more focussed support and remediation and you can also give more able learners tasks that can challenge them further.

FIRST TERM: WEEK 9 OVERVIEW

Hours: 5				**Number of periods: 5**	
Learning Outcomes and Assessment Standards LO 1 AS 3, AS 5, AS 6, AS 8, AS 12			**Milestones:** • Counting in a variety of intervals • Know or quickly determine multiples of single-digit numbers to at least 100 (multiplication tables • Know or quickly determine multiples of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 up to at least 1 000 • Solve problems that involve repeated addition • Solve problems that involve grouping and sharing.		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Counting in different units (threes, fours etc.). Repeated addition (multiplication) problems	Counting in groups, mental addition and repeated addition. Repeated addition (multiplication) problems.	Repeated addition (multiplication) problems.	Grouping and sharing problems.	Grouping and sharing problems.
Resources	Worksheets with questions (Annexure S).	Problems set by teacher.	Problems set by teacher.	Problems set by teacher.	Problems set by teacher.

WEEK 9: DAY 1

Notes to the teacher:

- This lesson is about the concept of multiplication as repeated addition, and the development of multiplication skills.

Resources:

- Annexure S (copies for each learner).
- Copies of Annexure R, in case some learners need it to make sense of the activities for the day.

ACTIVITIES FOR THE DAY

ORAL

Activity 1

Arrange learners in groups of no more than four learners per group.

The learners in each group should count together, *very softly*, in threes up to 100, and each learner should write the numbers down.

In each group, they should repeat this by counting in fours, fives, sixes, sevens, eights, nines and tens, up to 100 each time, and each learner should write the sequence down individually.

CONCEPT DEVELOPMENT

Activity 2

Learners should now work individually. They should do multiplication worksheet 2 from Annexure S, or similar questions.

Suggest to learners that they may use the counting patterns they have formed in Activity 1, or count again, to help them to find the answers.

Activity 3

Arrange learners in groups of no more than four learners per group again.

The learners in each group should count together, *very softly*, in tens up to 100, and each learner should write the numbers down.

In each group, they should also count in twenties up to 200, in thirties up to 300, in fourties up to 500 etc up to counting in nineties up to 900, and each learner should write each sequence down individually.

CONSOLIDATION

Activity 4

Learners should work individually again. They should do multiplication worksheet 3 from Annexure S, or similar questions.

WEEK 9: DAY 2

Notes to the teacher:
- Learners work on multiplication problems

Resources:
- Copies of Annexure R, in case some learners need it to make sense of the activities for the day.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1

Ask learners where they think the goods sold by retail shops come from. Discuss the delivery of stocks to retail shops. Different providers will deliver different kinds of goods to the shop.

Describe this problem to learners, and ask learners to take notes while you describe it.

Circulate between learners while you talk, and check that they take notes.

Repeat where necessary.

Situation 1

Early one morning, a fruit supplier delivers 20 bunches of 4 bananas each to shop.
Later in the day the supplier delivers 8 bunches more, again with 4 bananas in each bunch.

When you are satisfied that all learners have taken notes so that they have all the information about the situation, ask learners to find out how many bananas were delivered, in total, to the shop on that day. They should do this individually.

Situation 2

Early one morning, a fruit supplier delivers 30 bunches of 8 bananas each to shop.
Later in the day the supplier delivers 7 bunches more, again with 8 bananas in each bunch.
How many bananas are delivered to the shop in total?

Also write situation 2 on the board now, so that learners who work quickly do not get bored.

Circulate and observe how learners do Situation 1. It is just fine if they do it in several steps, for example as shown below, and if they use the counting patterns they have produced on the previous day at present.

20 bunches of 4 bananas each is 80 bananas
8 bunches of 4 bananas each is 32 bananas
80 + 32 = 112 bananas

Note that learners are not at all supposed to do column multiplication at this stage.

Multiplication in columns is only to be introduced in Grade 6.

Give another similar problems during the course of the lesson, for example:

Situation 3

Early one morning, a fruit supplier delivers 70 bunches of 6 bananas each to shop.
Later in the day the supplier delivers 4 bunches more, again with 6 bananas in each bunch.
How many bananas are delivered to the shop in total?

In the above problems, learners were strongly led to do multiplication in two steps, for example to calculate 74×6 by calculating 70×6 and 4×6, and then adding the two results.

Give the following problem. Hopefully, learners will now decide for themselves to split the problem into two parts.

Situation 4

Early one morning, a fruit supplier delivers 57 bunches of 6 bananas each to shop.
How many bananas is this in total?

At some stage during the lesson, write a solution on the board, expressed verbally like this:

20 bunches of 4 bananas each is 80 bananas
8 bunches of 4 bananas each is 32 bananas
80 + 32 = 112 bananas

Show learners that this work can be more briefly written up by using the multiplication sign:

20 × 4 = 80 and 8 × 4 = 32. 80 + 32 = 112.

At a later stage, preferably only in the next lesson, you may suggest that they write more formally:

28 × 4 = 20 × 4 + 8 × 4 = 80 + 32 = 112.

WEEK 9: DAY 3

Notes to the teacher:

- Learners do more multiplication problems

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Give a variety of multiplication problems in context, like those in the previous lesson.

Monitor the learners, and help slower learners to make sense of the situations and to use counting in groups (like in the lesson for Week 9 Day 1) where necessary in cases where they cannot recall multiplication facts.

You may also give some problems that require several operations, for example:

Situation 1
Early one morning, a fruit supplier delivers 34 bunches of 6 bananas each to shop.
Later in the day the supplier delivers 17 bunches more, again with 6 bananas in each bunch.
How many bananas are delivered to the shop in total?

Situation 2
Early one morning, a fruit supplier delivers 43 bunches of 4 bananas each to shop.
Later in the morning the supplier delivers 27 bunches more, with 5 bananas in each bunch.
In the afternoon, the supplier delivers another 18 bunches, with 9 bananas in each bunch.
How many bananas are delivered to the shop in total?

WEEK 9: DAY 4

Notes to the teacher:

- In this lesson learners will work on problems involving grouping and sharing. While you may realize that these problems can be solved by doing division, learners will not realize it. Do not tell them that the problems can be solved by doing division. They will be able to solve the problems, by using addition and repeated addition. They can learn later in the year that problems like these can be solved by doing division.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Have a discussion with the class about different ways in which people can travel. People may for example walk, use a bicycle, go by car or taxi, or by bus or train or they may fly or travel with a ship. Make the discussion more specific about different ways in which the learners in their school may travel to another school some distance away.

Ask the following question, write it on the board, and ask learners to work on it individually:

Situation 1

874 learners have to travel to another school. The bus service has many buses. They are willing to let 45 learners travel in one bus. How many buses should be hired, so that all the learners can go?

Leave learners alone for a while to work on the problem individually, but do check that they engage individually and not in pairs or small groups.

In the meantime, also write situations 1 and 2 on the board. Learners may work on these situations after they have resolved Situation 1 satisfactorily.

Circulate between learners and identify learners who may not quite understand the situations and questions. Ask them to tell you how they understand the questions. In this way they may actually develop a better understanding. **Do not try to help learners find out what to do**, **because that may cause them to stop thinking!** Limit your interaction with learners to help them to understand the contexts in which the questions are situated.

Observe and try to understand the methods that learners use.

Situation 2

874 learners have to travel to another school. The bus service has 15 large buses, that are all exactly the same. The principal decides that the learners should be evenly spread over the 15 buses. How many learners should travel in each bus?

Situation 3

874 learners have to travel to another school. Only taxis are available. One taxi can take only 17 learners. How many taxis are needed, if all the learners have to travel at the same time?

WEEK 9: DAY 5

Notes to the teacher:

- In Activity 1, Learners will work on two problems. While you may realize that these problems can be solved by doing division, learners will not realize it. Do not tell them that the problems can be solved by doing division. They will be able to solve the problems, by using addition and repeated addition. They can learn later in the year that problems like these can be solved by doing division.
- In Activity 2, learners will make up and down patterns again, like in the lesson for Week 6, days 2 and 3.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1

Write the following two problems on the board. Talk the situations through with the learners, with a view to ensure that they all understand the contexts and the questions. Tell them they may work in any way they like, but they have to work individually.

Each learner may also decide which question to start with. Disengage from the learners after you have set the questions, so that they realize they need to work on their own.

1. A question about chairs:

   Chairs cost R87 each at a shop.

   How many chairs can you buy with R500?

2. A question about apples:

   500 apples have to be shared between 87 people.

   How many apples should each person get?

Some learners may do these questions very quickly. Write the following additional questions on the board right away, so that these learners will have work to do:

3. Chickens cost R36 each at a shop. How many chickens can you buy with R850?
4. R850 must be fairly shared between 36 people. How much money should each person get?
5. Big chickens cost R47 each at a shop. How many chickens can you buy with R920?
6. R920 must be fairly shared between 47 people. How much money should each person get?

Circulate between learners and identify learners who may not quite understand the questions. Ask them to tell you how they understand the questions. In this way they may actually develop a better understanding. **Do not try to help learners find out what to do**, **because that may cause them to stop thinking!** Limit your interaction with learners to help them to understand the contexts in which the questions are situated.

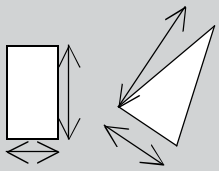
Observe and try to understand the methods that learners use.

FIRST TERM: WEEK 10 OVERVIEW

Hours: 5				**Number of periods: 5**	
Learning Outcomes and Assessment Standards LO 1 AS 5 LO 2, AS 1; LO 3, AS 1			**Milestones** • Recognises, identifies and names two-dimensional shapes including: - Circles, Polygons - triangles, quadrilaterals (squares, rectangles, rhombus, trapezium, kites), pentagons, hexagons, heptagons, octagons - in terms of the number of sides up to 8-sided figures. • Draws, sorts and compares physical two-dimensional shapes (listed above) according to geometrical properties including Number of sides, straight and curved sides. • Recognises and describes natural and cultural two-dimensional shapes, and patterns in terms of geometric properties. • Investigate and extend number patterns of learners own creation		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Oral and mental work	Match shape name cards to 2-D shapes; compare squares and rectangles, circles and ovals.	Learners build different 2-D straw shapes in their minds according to descriptions given.	Learners identify shapes by the described properties.	Learners add and subtract mentally.	Learners add and subtract mentally.
Content Focus	Group outdoor activities: Making 2-D shapes with arms and legs, tracing shapes in the sand and using lengths of elastic; Feely bag shapes.	Visualising, drawing and constructing 2-D shapes on geoboards; comparing and naming polygons by their properties; assessment worksheet	Introduce and investigate quadrilaterals; squares and rectangles, the rhombus, trapezium and kite; sort pictures of 2-D shapes; draw and label quadrilaterals.	.Introduce concept s of magic square, rows, columns and diagonal rows, which are elements of patterns in diagrammatic form.	.Introduce concept of first term, second term etc. with respect to patterns. Learners make their own number patterns and pose problems regarding patterns.
Resources	Shape name cards; outdoor area; lengths of elastic; bags with 2-D plastic or cardboard shapes	Triangle made with straws and prestik; Geoboards and elastic bands, dotted grid paper, assessment worksheet.	Worksheet with different 2-D shapes; group worksheets with rhombus, trapezium and kite.	.	.

WEEK 10: DAY 1

Notes to the teacher:



The activities for this week's lesson focus on 2-D shapes. We call flat shapes and drawings of shapes like these ones, two-dimensional or 2-D because we see them in only two dimensions, length (height) and breadth (width).

Building learners' geometric skills and knowledge comes with lots of opportunities to manipulate, explore and talk and share, write and draw about what they have learned. Good shape and space activities involve a lot of preparation. You need to collect manipulative materials and design and copy worksheets that have pictures of the shapes you are focussing on. Read through the activities well beforehand so you can plan carefully for all the materials and supplementary resources you will need for each activity.

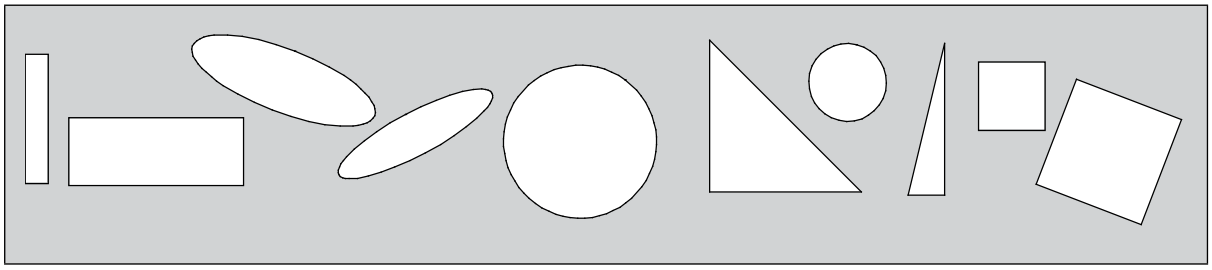
Resources:

- Flash cards with drawings of 2-D shapes and matching name cards
- Lengths of elastic about 3 m long, joined at either end
- Plastic shapes or cardboard cut-out shapes prepared beforehand
- Cloth bags for hiding shapes - have enough available for learners to work in groups

ACTIVITIES FOR THE DAY

ORAL ACTIVITY (15 minutes)

- Use A4 sized paper or cardboard to make flash cards and matching name cards of shapes like the ones below. Draw the shapes and write each shape name on a card. Include at least two examples of each shape to show different sizes and orientations.



- Hold up one shape card at a time, and ask learners to name it. As they do, put each shape on the board with prestik with its correct name card underneath. Group shapes of the same kind together. Ask questions that encourage learners to explain both their similarities and differences. They can compare the number of sides, say if they are curved or straight, say which shapes have corners and how many. If shapes have straight sides, learners can also estimate their lengths to see if they are equal or not. Ask them to describe how squares differ from rectangles and ovals from circles.

CONCEPT DEVELOPMENt (30 minutes)

- Take learners outside for these activities. Find an area where there is enough space for them to spread themselves out. They can work in small groups of mixed ability. Time the activities so that each group has a chance to do at least two of the suggested activities in the 30 minutes allocated for this activity.

Group 1: Body shapes

- This group makes shapes using their arms or legs. For example three learners can join hands to form a triangle or four learners may lie at 90^0 angles to each other to form a rectangle or square. To make squares they will need to work out which learners have more or less the same arm or leg lengths to make all four sides. For rectangles, learners on opposite sides must be the same.
- They should talk about the different shapes they make, name them, describe their properties and compare their sizes and orientations.

Group 2: Walking shapes

- Find a sandy area for this group to work. Name a shape that you want them to copy. Talk about its properties. Ask one learner to 'walk the shape'. As s/he walks, another learner follows behind and draws the path s/he makes with a stick on the ground. Learners can then play on their own. One learner has a turn to choose a shape and describe it, while the other learners work in pairs to 'walk the shape' and trace it out in the sand. They must try to do this as accurately as possible.

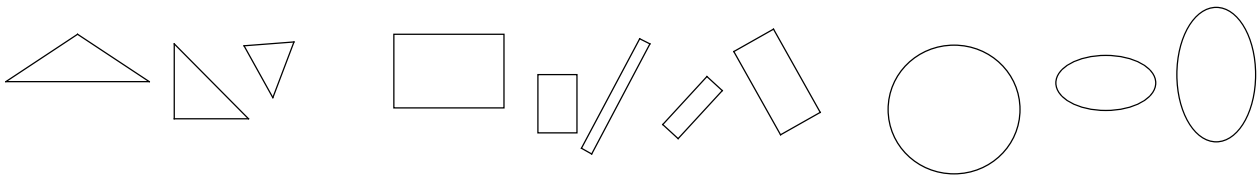
Group 3: Elastic shapes

- Demonstrate with three learners how they can use the elastic bands to form a triangle. Have two of them hold the elastic at the two ends, while the third learner pulls the elastic between them to make the third point (apex) of the shape. Challenge them to work out how many different triangles they can make. Four learners can work together to make different kinds of quadrilaterals, five learners to make pentagons, six to make hexagons …
- As learners work on the different tasks, move around from group to group. Ask questions that help them to develop the language they need to describe and compare the shapes they make as well as name them accurately. Find out which shape names they already know.

Feely Bag shapes

- Learners come back to class and re-form into their groups. Give each group a bag of cardboard shapes or use plastic shapes that come with standard maths kits. The bags must be opaque *(not see-through).* Include an assortment of shapes of the same kind but with different dimensions. For example:

Triangles **Rectangles** **Circles and ovals**



Learners take turns to put their hand inside the bag to choose a shape without looking. They must feel around the edges and the surface of the shape to work out what the shape is. They then take the shape out of the bag to check if they were right. Another version of the game is for learners to feel for a shape and describe its properties and the rest of the group must decide what shape it is.

WEEK 10: DAY 2

Notes to the teacher:
In this lesson, learners draw and construct 2-D shapes on geoboards or grid paper. This helps to consolidate an understanding of the properties of different polygons and how one differs from another in terms of the number of sides and corners (angles). It also helps them to develop the concept that the properties of a shape remain the same even if its position and orientations change - a triangle facing up, down or to the left is still a triangle. The geoboard or dotted grid is also a good way to build area concepts. As learners work out what the largest rectangle, triangle etc that they can make is, they have to think of size or the amount of space their shapes take up and compare them.

Resources:
- A triangle made out of straws and prestik
- Geoboards and elastic bands
- Dotted grid paper and pencils
- Assessment worksheet or similar example from textbook
- Observation sheet

ACTIVITIES FOR THE DAY

MENTAL WORK: Visualising shapes (15 minutes)

- Show learners a triangle that you've made from three straws and prestik. Now ask them to visualise in their minds other straw shapes that you describe to them. For example, ask them to 'build' in their minds with imagined straws and prestik, the smallest possible square, the next biggest square; the smallest possible rectangle, the next biggest rectangle, a triangle with one side longer than the other two. Once they get a picture of the shape, they draw a rough sketch of it to show how many straws they made to 'build' it. Give a few learners the chance to come to the board and draw the shapes they visualised.

CONCEPT DEVELOPMENT (25 minutes)

- Learners now work in small groups or pairs to draw different shapes on dotted grid paper by using elastic bands and geo-boards, depending on the resources you have available.
- At first they work freely making shapes of their own choice. Move around the class to observe and give guidance. Help learners see relationships and make comparisons, for example between the number of sides and number of corners a particular shape has. If they make different kinds of triangles, ask them to say how they're the same and different. For example, you can ask:

  "Which sides have the same length? Which are shorter or longer?

INVESTIGATION (15 minutes)

Give learners instructions to follow to make or draw shapes that you describe to them. They can work on geoboards or on grid paper. For example:

Make a triangle with its point (apex) facing to the top of the paper. Now make the same triangle with its point facing to the left, to the right or downwards.

Make big rectangles. Add bands (or draw lines if they are working on grid paper), to divide the rectangle into two or four equal parts. What shapes have you got now?

Make the biggest square, rectangle or triangle to fit on your board or on your grid paper.

Make a rectangle whose length is half its width.

Make a square that is 12 spaces across. Make 4 squares inside the big square.

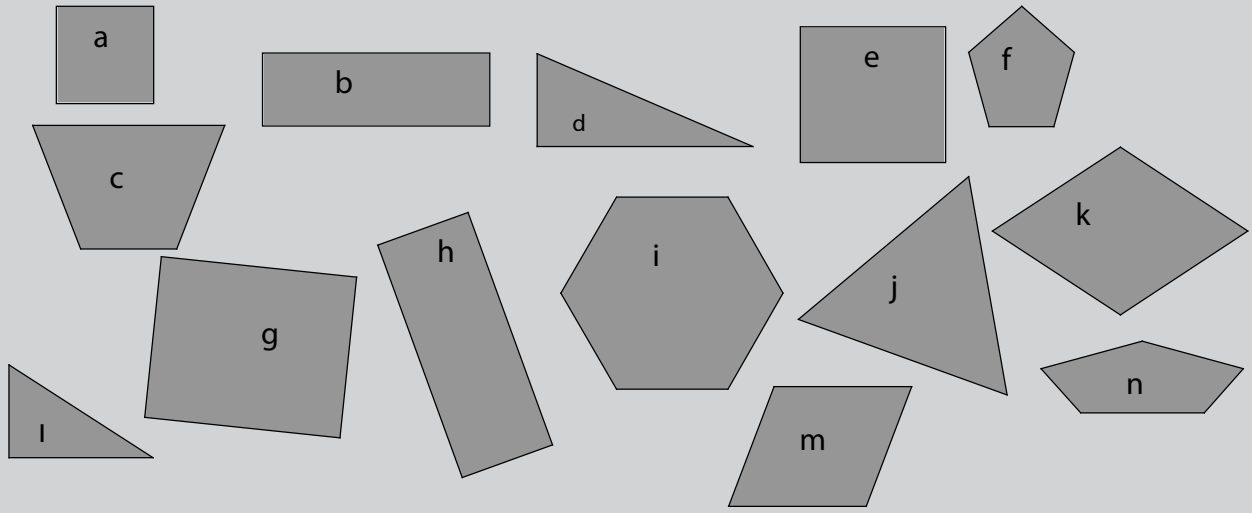
Draw or make four different kinds of 4-sided figures (quadrilaterals). Talk about how the shapes are the same and how they are different. Which shapes do they know the names of?

Written work (15 minutes)

- Prepare a worksheet like the one below to review if learners can count the sides and corners of these shapes correctly and which shape names they already know.

Assessment Worksheet 5.1

Assessment Worksheet 5.1



Fill in the information for each of the other shapes, on a table as given on the next page.

	Name	Number of sides	Number of corners
a	**Square**	**4**	**4**
b			
c			
d			
e			
f			
g			
h			
i			
j			
k			
l			
m			
n			

WEEK 10: DAY 3

Notes to the teacher:

In this activity learners find out more about the sub-class of polygons we call quadrilaterals. They begin with squares and rectangles, which they already know well, and then expand the investigation to include rhombuses (diamonds), trapeziums and kites. They complete an Assessment Worksheet where they sort pictures of 2-D shapes into quadrilaterals and non-quadrilaterals. The activity focuses their attention on the general properties of quadrilaterals and then on the specific properties of each example.

Resources:

- Worksheet with different kinds of 2-D shapes: quadrilaterals and non–quadrilaterals, open and closed; group worksheets with pictures of a rhombus, a trapezium and a kite.

ACTIVITIES FOR THE DAY

MENTAL ACTIVITY: What shape is it? (10 minutes)

Describe one or two familiar shapes to learners, without giving their names.



I'm thinking of a shape that has 4 sides. It has 2 long sides and 2 short sides. What shape am I thinking of?

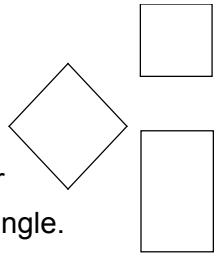
They must say what shape you are describing. Once they answer correctly, draw the shape on the board.

Include the following examples: circles, ovals, triangles and squares.

A **quadrilateral** is a shape with 4 straight sides.

CONCEPT DEVELOPMENT (20 minutes)

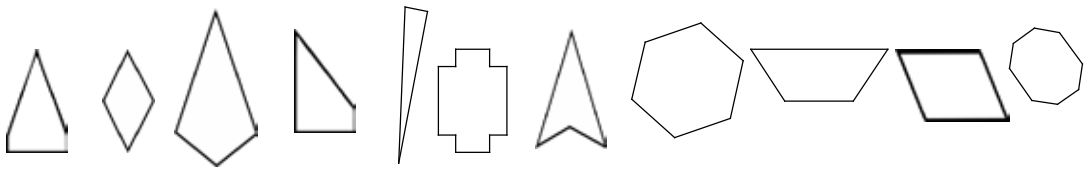
- Write the name QUADRILATERAL in big letters on the board. Ask learners if they know which shapes we call quadrilaterals. Tell them that *quad* stands for four to give them a clue. After some discussion, give them the definition. Explain that the two parts of the name come from Greek; '*quad'*, for four and '*lateral'* for sides.
- Draw a rectangle and a square on the board to show learners examples of familiar quadrilaterals. Ask learners to think of others they know of. Some may say diamond for the rhombus shape. Draw a rhombus next to the other two shapes. Ask them to say how it compares with the square and the rectangle.



For your information

A **rhombus** is a quadrilateral with all four sides of equal length. A square is a special kind of rhombus, but not all rhombuses are squares since squares always have 90° corners.

- Prepare a worksheet with drawings like these, or find a similar activity or drawings in your textbooks that you can use. Some of the shapes should be quadrilaterals and others not.

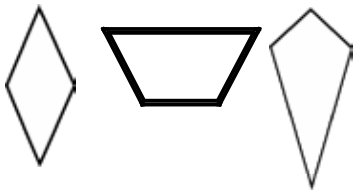


A B C D E F G H I J K

Learners work in pairs or small groups. They discuss and compare the shapes, count their sides and corners and then sort them into two groups; quadrilaterals and non–quadrilaterals. Spend time assisting learners that generally struggle to keep up. After enough time, review the task together with the whole class. Go around and give each group a turn to say where a shape belongs until all the shapes are sorted.

Quadrilateral	Not a quadrilateral
	A
B	

INVESTIGATION (25 minutes)



- Make a worksheet with these three quadrilaterals for each group of learners to use. Copy the same shapes on the board as large as you can. Try to be accurate!
- Ask learners to say if these shapes are also quadrilaterals and how they know. Once they've agreed that they are, let them work in their groups to look more closely at the three examples and describe them in as much detail as possible. Move between groups and support learners as they discuss, but don't give out new names yet. Rather ask guiding questions that help learners to come up with their own definitions:
  "Do their angle or corner sizes look the same? Which sides are the same lengths? Which are different? How are these shapes the same yet different from one another?"
  Learners might say things like:

The rhombus is the only one which has all four sides the same length.



The 2nd shape is shorter at the bottom,

In the last shape, the bottom two lines go out and the top ones bring the shape in again.

- Give each group a chance to say what they found out about each shape. Introduce the two new shape names and label each shape next to your drawings on the board. **RHOMBUS TRAPEZIUM KITE.** Learners can copy these names in their books.

Explaining the Homework task (5 minutes)

Collect the worksheets from each group. Explain to learners that for homework they must work from memory and draw two examples of each of the five quadrilaterals they learned about. *(Square, rectangle, rhombus, trapezium and kite).*

WEEK 10: DAY 4

Notes to the teacher:

- Learners will work with a partner and see if they can see a pattern or find out how the magic square works.
- They will complete magic squares in pairs and alone.
- You may wish to turn this into a game by letting learners time each other to see who can find the solution in the shortest time.
- You may also extend the lesson by giving learners a number range within which to work and they then design their own magic squares

Resources:

- Pencils
- Jotters and class work book

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Draw the following square with numbers on the board and ask learners to work with a partner and see if they can see anything interesting about it.

4	9	2
3	5	7
8	1	6

Ask learners to put up their hands and give you their suggestions. Some learners may notice one or more of the following properties:

- the numbers in each row add up to 15
- the numbers in each column add up to 15
- the numbers in each diagonal add up to 15

If no learners observe any of these properties, you may ask them to add up the numbers in each row, add up the numbers I n each column, and add up the numbers in each diagonal. You will have to show them what you mean by “row”, “column’ and “diagonal”.

You may tell learners that such a collection of numbers, where no number is used twice, is called a “magic square”.

Draw another magic square on the board, but this time leave out some numbers:

	6	36
	30	
	54	

Explain to learners that they must first find the “magic” number (this is the total of the numbers in either one of the rows, columns or even diagonals) and then use the number to solve the magic square. The solution to this magic square is given on the next page. The magic number here is 90. Learners copy the magic square into their jotters, and complete it individually.

48	6	36
18	30	*42*
24	54	*12*

Let learners tell you the solution to the magic square and then tell you the number sentences that they used to calculate the answers..

Learners now complete the magic squares given below. When learners have completed the magic square they record the 8 number sentences they can find in the magic square, and also the total of the numbers in each row.

You can add some excitement to the task by letting learners time the length of time it takes them to solve the magic square.

11	41	
	24	15
28		37

148		136
	130	
124		

58		56
53		
54		

Activity 2

Let learners play the number bond game that you have used previously.

WEEK 10: DAY 5

Notes to the teacher:

- In this lesson learners will have opportunity to make number patterns, and to analyse each other's number patterns. The idea of subtraction as the "inverse" of addition (and the other way round) will come up while learners do the activities. The activities provide learners with opportunities to practice basic addition and subtraction skills.

Resources:

- A chart with the set of instructions as given below, or the set of instructions written on the board before the lesson begins.
- A clean sheet for each learner, to write on.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Learners will make more of their own number patterns. They should each have a pencil and paper ready, and a loose sheet of paper. They have to write the names at the top of their sheets, and work individually. Give the following set of instructions orally to the whole class, and point to them on the chart or board as you go along:

Step 1: Choose any number between 500 and 600 and write it down. This will be the first number in your first pattern.

Step 2: Choose any number between 3 and 12 but do not write it down. This will be your secret constant change number.

Step 3: Add your secret constant change number to your first number and write the result down.

At this point you should give a demonstration to the learners on the blackboard.

Tell them that you have chosen 34 as a first number and 10 as a change number.

Then write this on the board:

first number	second number	third number	fourth number	fifth number	sixth number	seventh number
534	544					

Circulate between the learners and check whether they do the same with their own numbers. While you do this, ask them to read step 4 on the chart/board and to do it. You may also say it orally:

Step 4: Add your change number to your second number and write the result down.

Also execute this step yourself and write it on the board, so that the board display now looks like this:

first number	second number	third number	fourth number	fifth number	sixth number	seventh number
534	544	554				

Step 5: Add your change number to your third number and write the result down.

Step 6: Continue like this.

Say to learners that they now have to continue in this way, adding the change number each time. Also demonstrate this on the board for your number pattern:

first number	second number	third number	fourth number	fifth number	sixth number	seventh number
534	544	554	564	574	584	594

Learners have to continue up to the tenth number.

Monitor learners whom you know may be prone to make mistakes, check for mistakes and let them make corrections where necessary.

When learners have finished writing their sequences, arrange them into groups of 4 or 5 learners. Within the groups, each learner has to pass his/her sheet with a number pattern to the learner on his/her right. Learners then have to find out what the secret change number was, and write this down, with the name of the learner who made the pattern. Then each learner has to pass the sheet to the learner on his/her right again, so that all members of the group get opportunity to identify all the other members' secret change numbers. When learners get their own sheets back, the members of the group should compare the constant change numbers they have identified for the different number patterns.

Each learner should then make a new pattern, with a new starting number between 600 and 800, and a secret change number between 10 and 20, and write down the first ten numbers of this pattern, for example in their classwork books, **but not on the loose sheets of paper with their first pattern**. Then they should write the fourth, fifth, sixth and seventh numbers of their patterns on the loose sheets, for example like this:

My fourth number is 634
My fifth number is 650
My sixth number is 666
My seventh number is 682

You may need to demonstrate this on the board, so that learners understand what they have to do. **But do not show them how to solve your example: the primary purpose of this activity is to provide learners with an opportunity to themselves find a way of solving problems like this.** When they have finished, they should send their sheets around again, and the other members of the group should now identify the secret change number as well as the first number of each pattern, the pass the sheet on. When learners get their own sheets back, the members of the group should compare the constant change numbers and starting numbers they have identified for the different number patterns.

Each group should do a third round of writing and analyzing number patterns. For the third round, each group should decide in what interval (for example between 600 and 800) their starting numbers should be, and also in what interval their secret change numbers should be. This time, the change numbers should be subtracted, not added. You may need to demonstrate this on the board with an example. Like in the previous round, learners should write only the fourth, fifth, sixth and seventh numbers of their pattern on the loose sheets they send around.

If there is time left, learners should do a fourth round of this activity. For the fourth round, each group should again decide on the intervals for the starting and change numbers. Each learner should decide for herself/himself whether to add or subtract the secret change number.

One may refer to the above as a “number pattern game”. Many variations are possible. For example, you may specify that learners should write only the third, sixth, ninth and twelfth numbers in their sequence down, on the sheet that is sent around. This increases the level of challenge involved in decoding the pattern:

My third number is 634
My sixth number is 667
My ninth number is 700
My twelfth number is 733
What is my first number and my constant change number?

Annexures

Annexure A (Trays and Racks)

Annexure B (Flard cards)

Annexure C (Envelope template)

Annexure D (Number bond cards)

Annexure E (Apple counting sheets A to D)

Annexure F (Apple counting sheets E to I)

Annexure G (Prism tube template)

Annexure H (Apple counting sheets J to M)

Annexure J (Number writing worksheet)

Annexure K (Picture multiples of 10)

Annexure L (Multiples of ten and hundred)

Annexure M (Apple rooms)

Annexure N (Assessment task)

Annexure O (Fake money notes)

Annexure P(Template flat box)

Annexure Q (Fraction rulers)

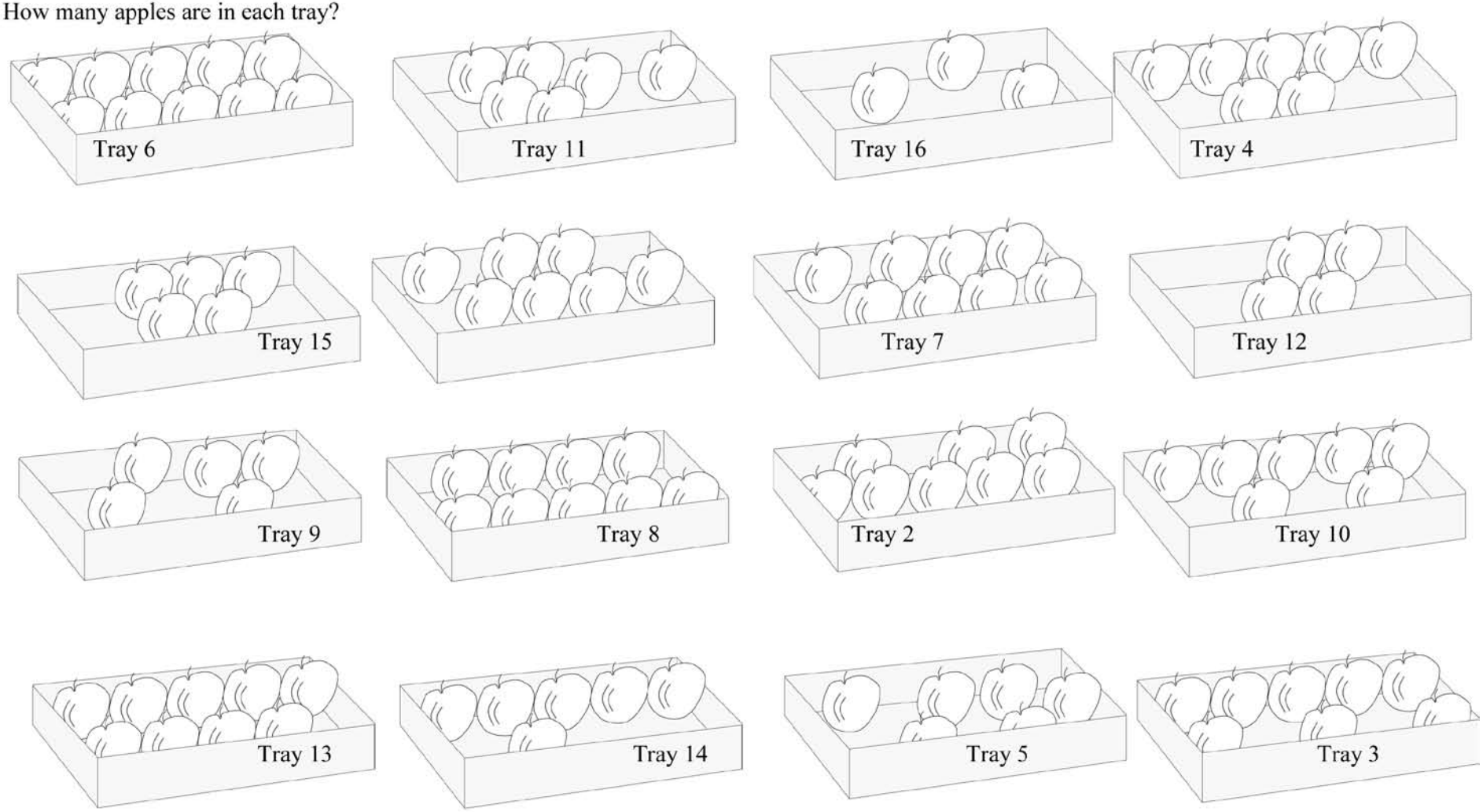
Annexure R (Banana bunches)

Annexure S (Multiplication worksheets)

Annexure V (Ruler)

Trays A

How many apples are in each tray?



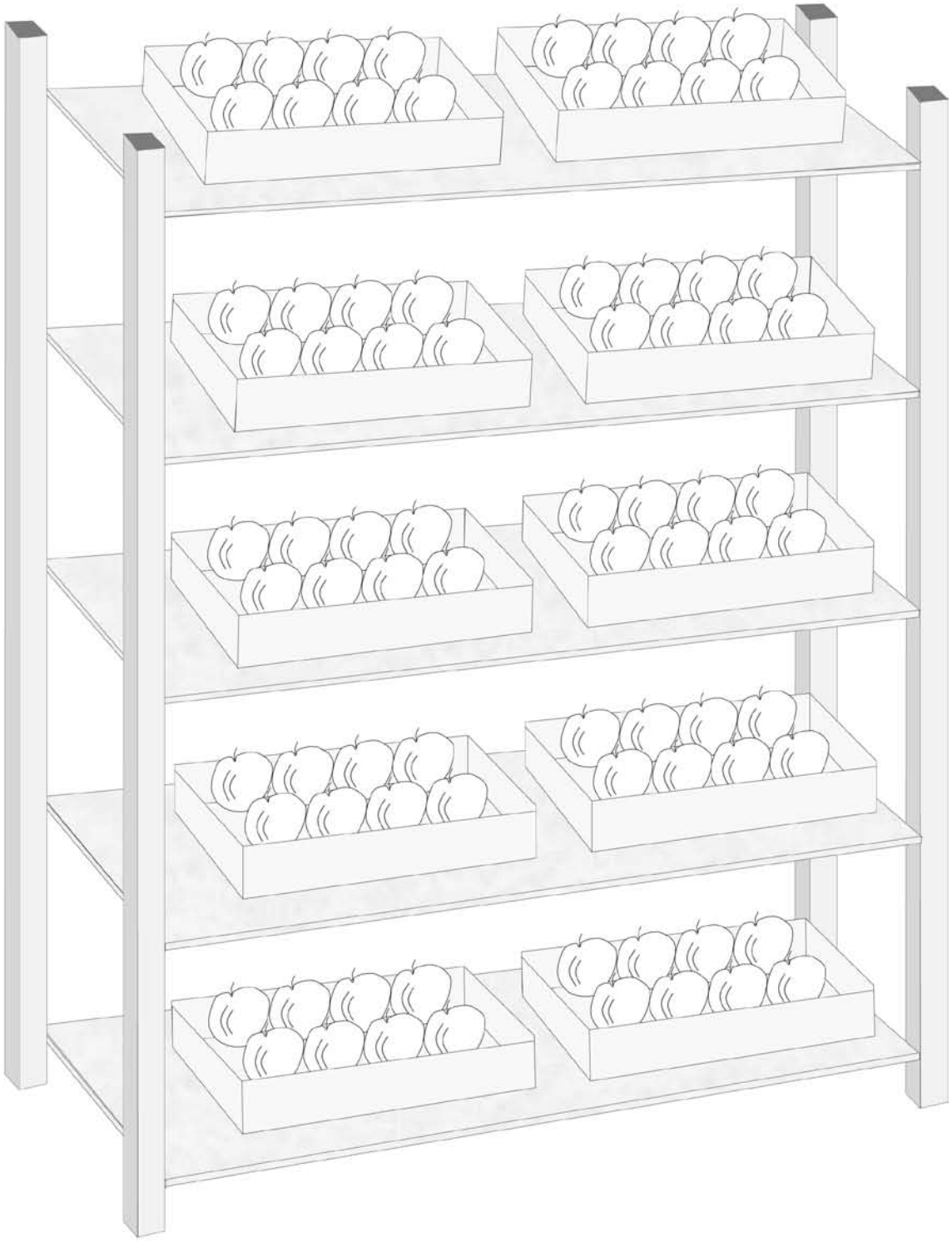
How many apples are there on this sheet, all together?

Trays B

Annexure A (Trays and Racks)

Rack A

How many apples are in each tray?



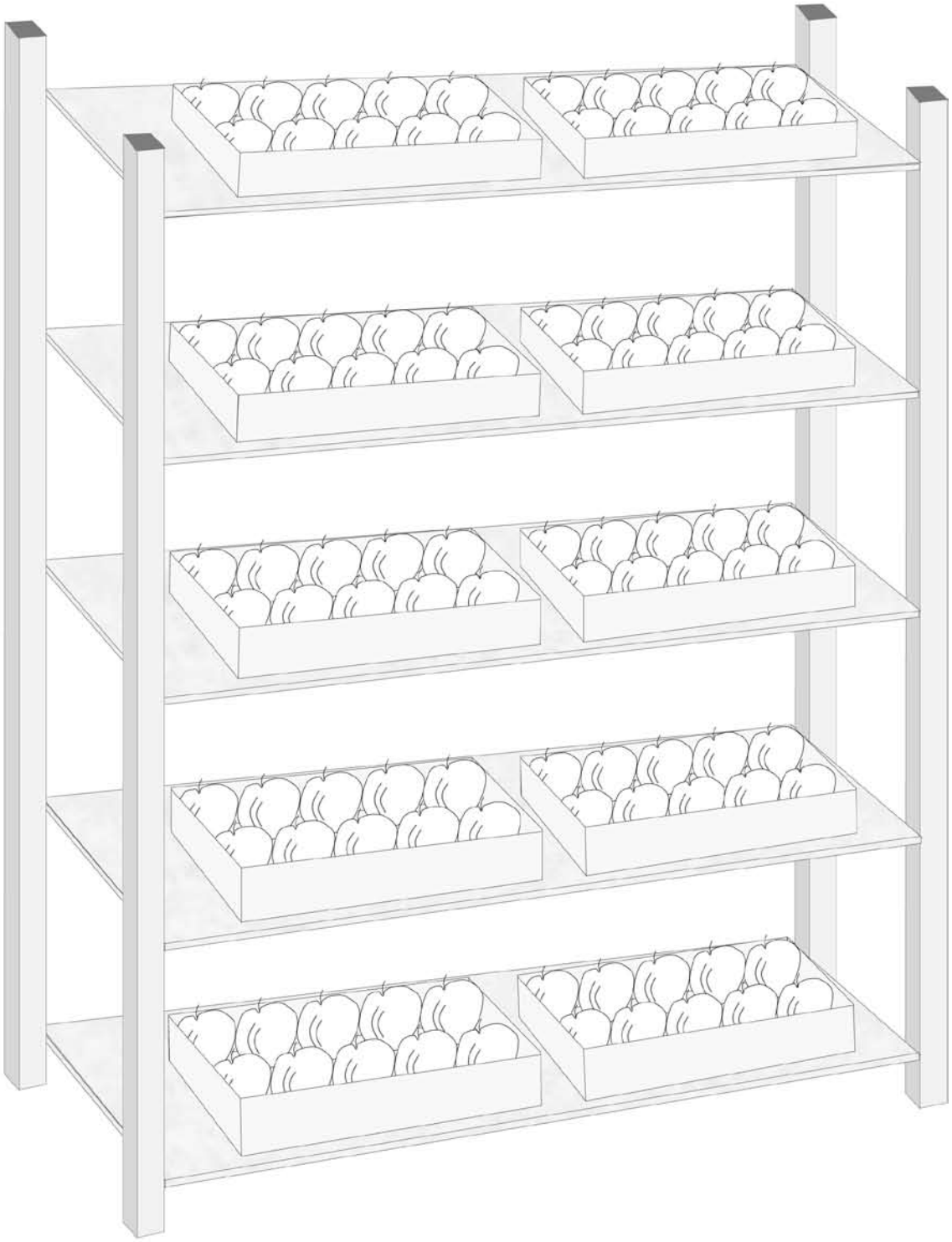
How many trays are there in the rack?

How many apples are there in the rack?

Annexure A (Trays and Racks)

Rack B

How many apples are in each tray?



How many trays are there in the rack?

How many apples are there in the rack?

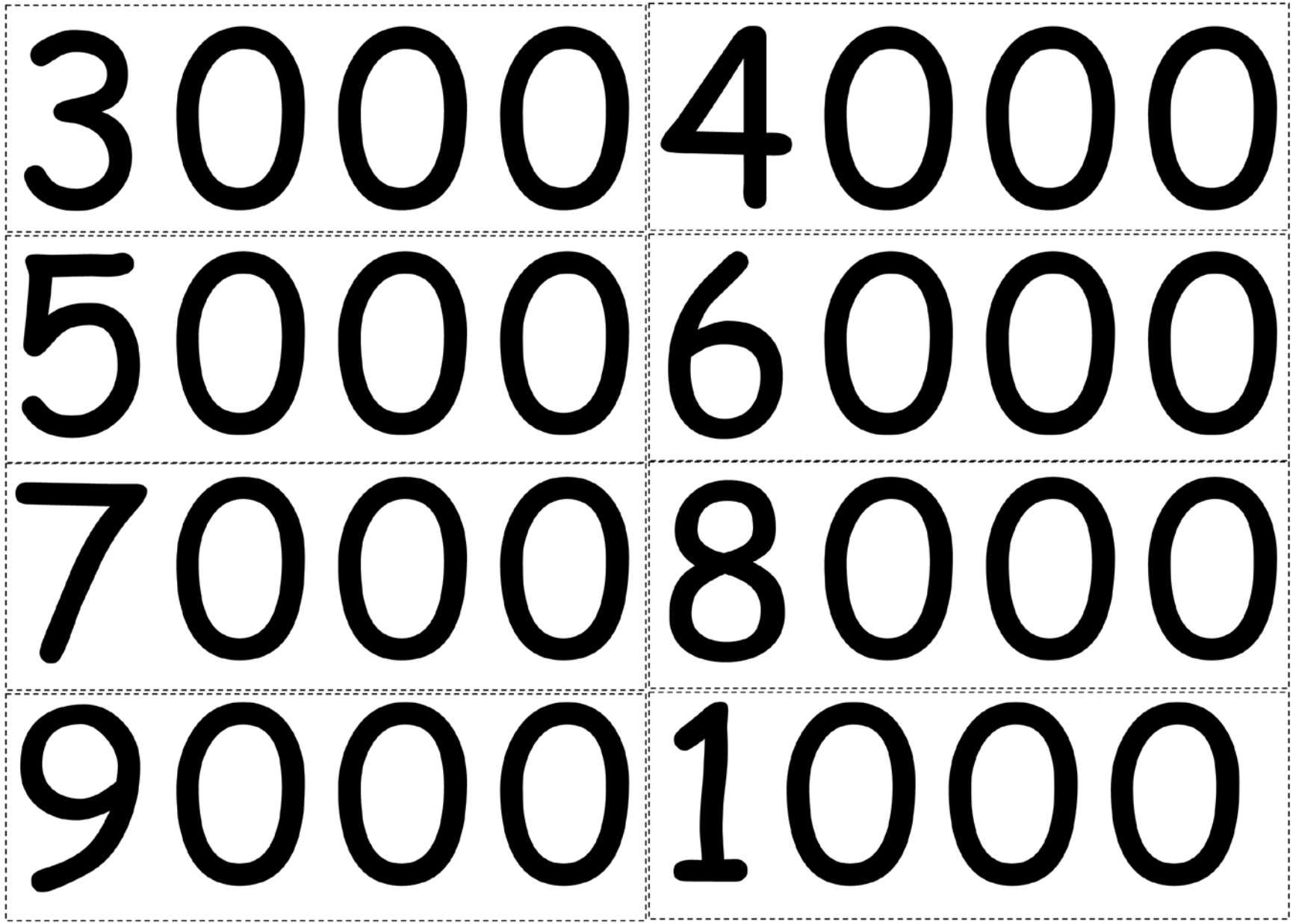
Annexure A (Trays and Racks)

3 000	1 000	9	
9 000	9 090	8 090	5
8 000	7 090	6 060	4 050
7 000	5 050	4 050	5

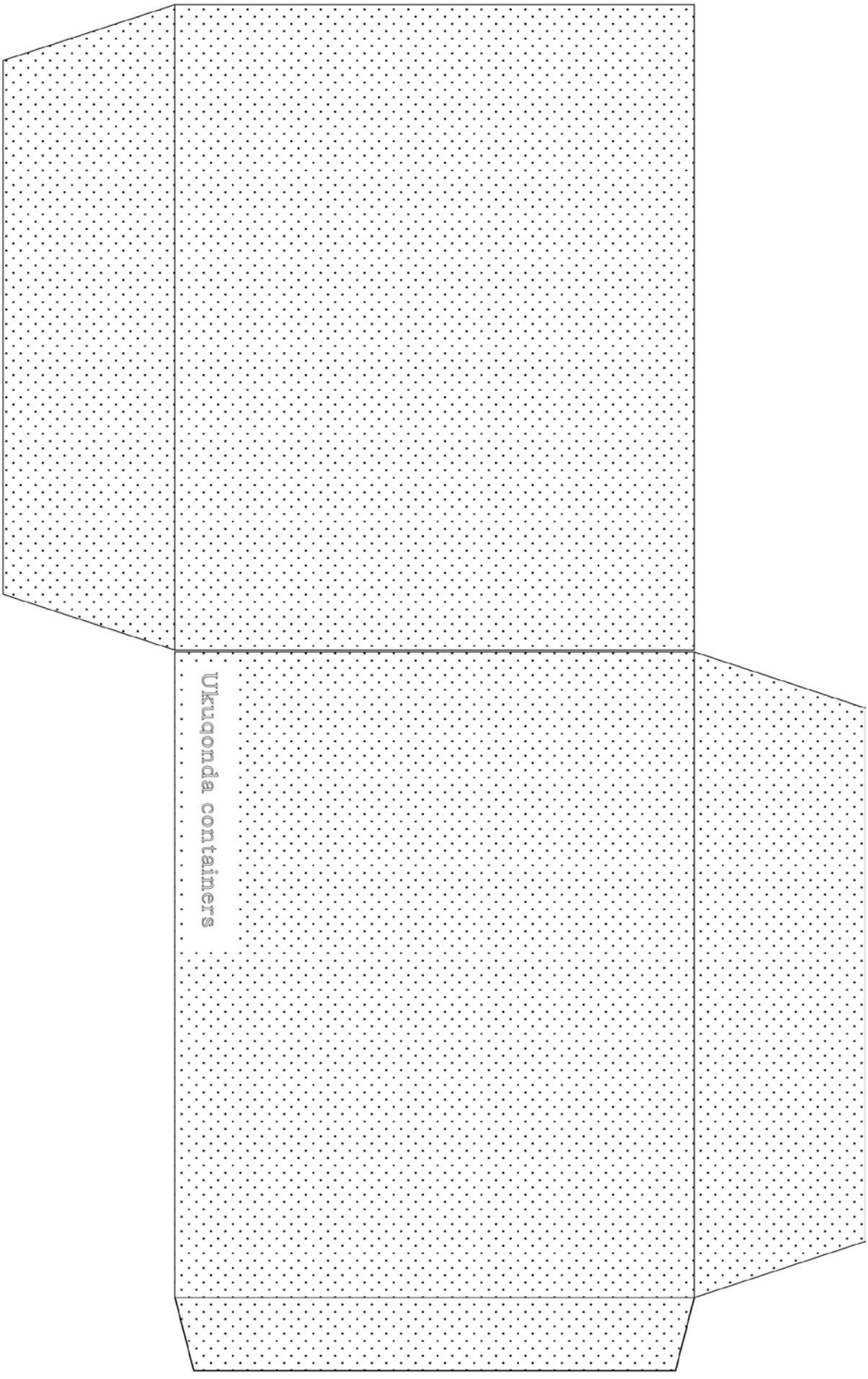
Annexure B (flard cards)

6004	5001	4006	2008
6024	5031	4007	2007
6034	5021	4026	2018

Annexure B (flard cards)



Annexure B (flard cards)



Annexure C 1 (Envelope)

100+200	10+20
100+300	10+30
100+400	10+40
100+500	10+50
100+600	10+60
100+700	10+70
100+800	10+80
100+900	10+90

Annexure D (Number bond cards)

200+200	20+20
200+300	20+30
200+400	20+40
200+500	20+50
200+600	20+60
200+700	20+70
200+800	20+80
20+90	30+80

Annexure D (Number bond cards)

300+200	30+20
300+300	30+30
300+400	30+40
300+500	30+50
300+600	30+60
300+700	30+70
30+90	40+90
100+100	10+90

Annexure D (Number bond cards)

400+200	40+20
400+300	40+30
400+400	40+40
400+500	40+50
400+600	40+60
40+70	40+80
50+60	50+70
50+80	50+90

Annexure D (Number bond cards)

500+200	50+20
500+300	50+30
500+400	50+40
500+500	50+50
600+200	60+20
600+300	60+30
600+400	60+40
60+50	60+60

Annexure D (Number bond cards)

60+70	60+80
60+90	80+90
700+200	70+20
700+300	70+30
70+40	70+50
70+60	70+70
70+80	70+90
800+200	80+20

Annexure D (Number bond cards)

80+30	80+40
80+50	80+60
80+70	80+80
200+200	20+20
300+300	30+30
400+400	40+40
500+500	50+50
60+60	70+70

Annexure D (Number bond cards)

900+200	90+20
90+30	90+40
90+50	90+60
90+70	90+80
90+90	800+300
80+80	90+90
950+50	150+150
250+250	250+750

Annexure D (Number bond cards)

900–200	90–20
900–300	90–30
900–400	90–40
900–500	90–50
900–600	90–60
900–700	90–70
900–800	90–80
900–100	90–10

Annexure D (Number bond cards)

800–200	80–20
800–300	80–30
800–400	80–40
800–500	80–50
800–600	80–60
800–700	80–70
800–800	80–80
800–100	80–10

Annexure D (Number bond cards)

700–200	70–20
700–300	70–30
700–400	70–40
700–500	70–50
700–600	70–60
700–700	70–70
700–100	70–10
200–100	20–10

Annexure D (Number bond cards)

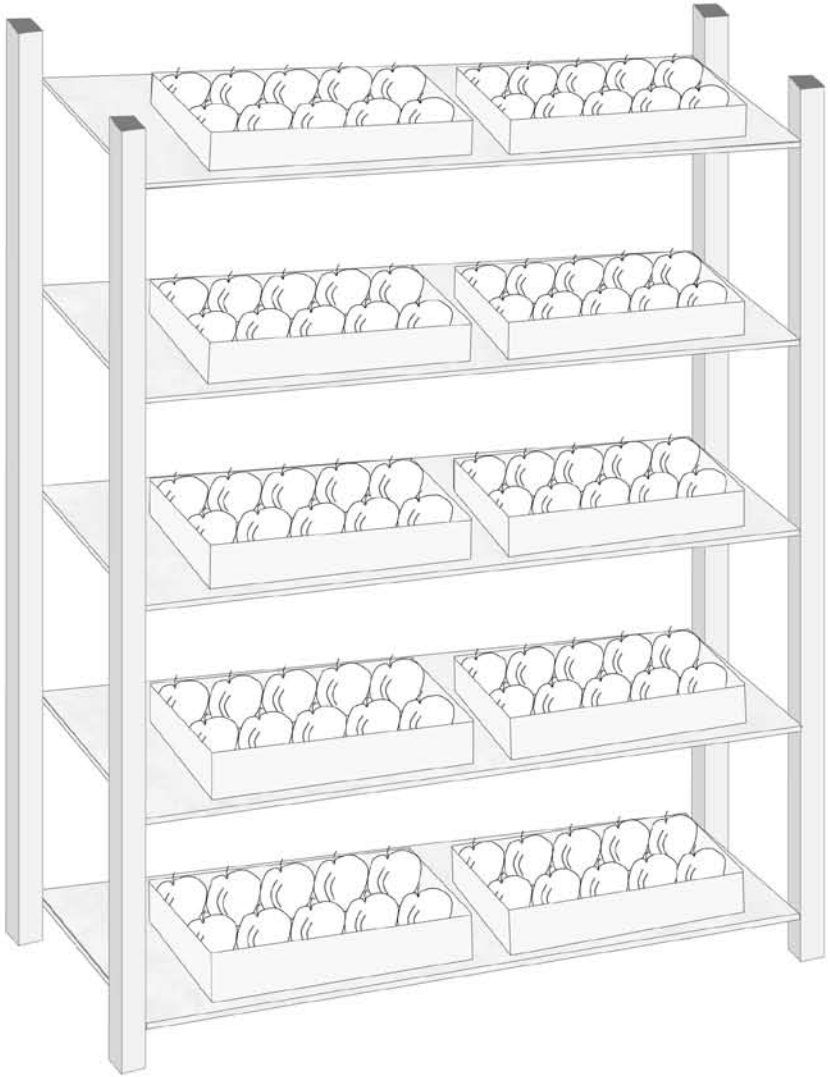
600–200	60–20
600–300	60–30
600–400	60–40
600–500	60–50
600–600	60–60
600–100	60–10
300–200	30–20
300–300	30–30

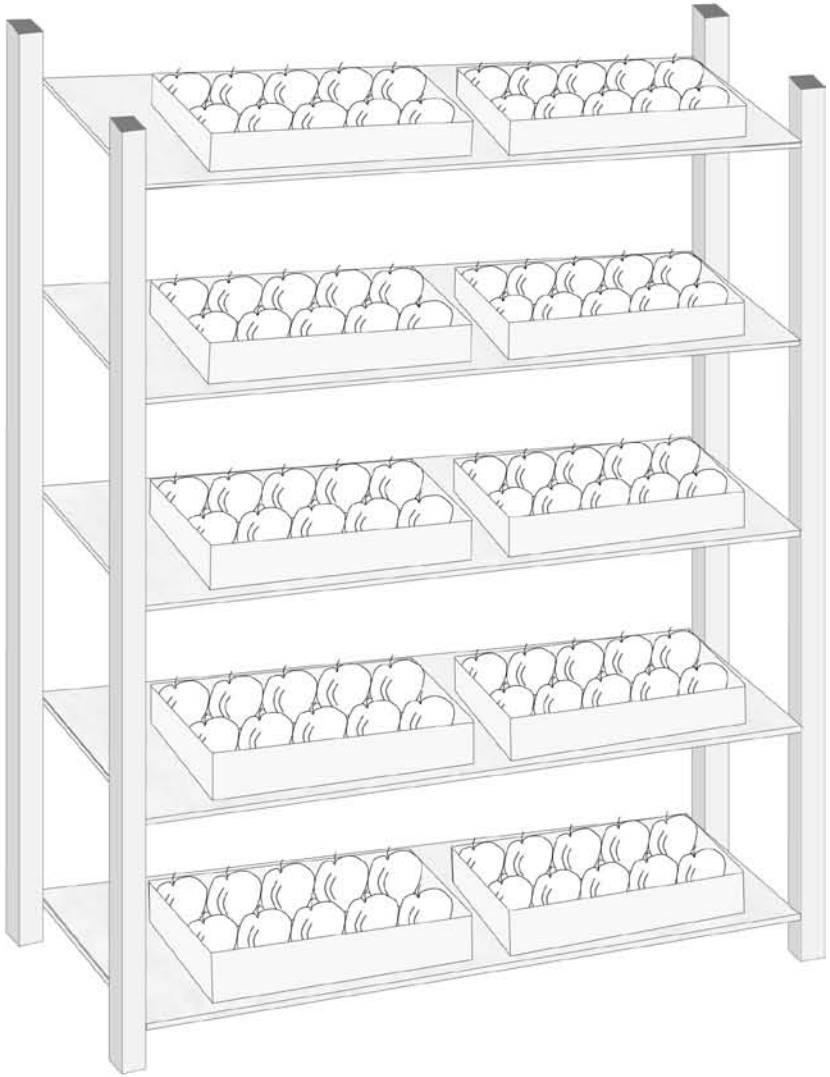
Annexure D (Number bond cards)

500–200	50–20
500–300	50–30
500–400	50–40
500–100	50–10
400–200	40–20
400–300	40–30
400–100	40–10
200–200	20–20

Annexure D (Number bond cards)

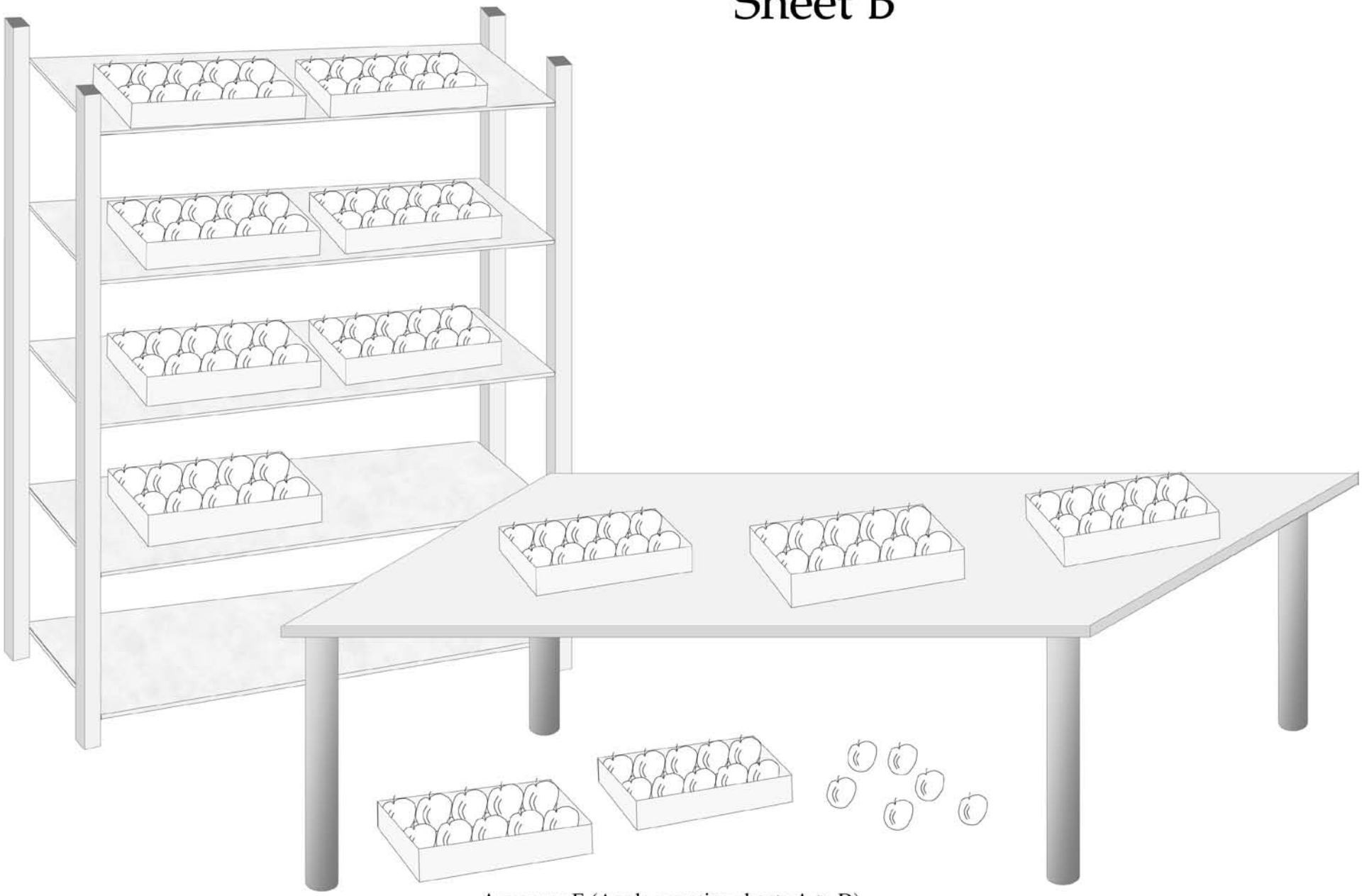
Sheet A





Annexure E (Apple counting sheets A to D)

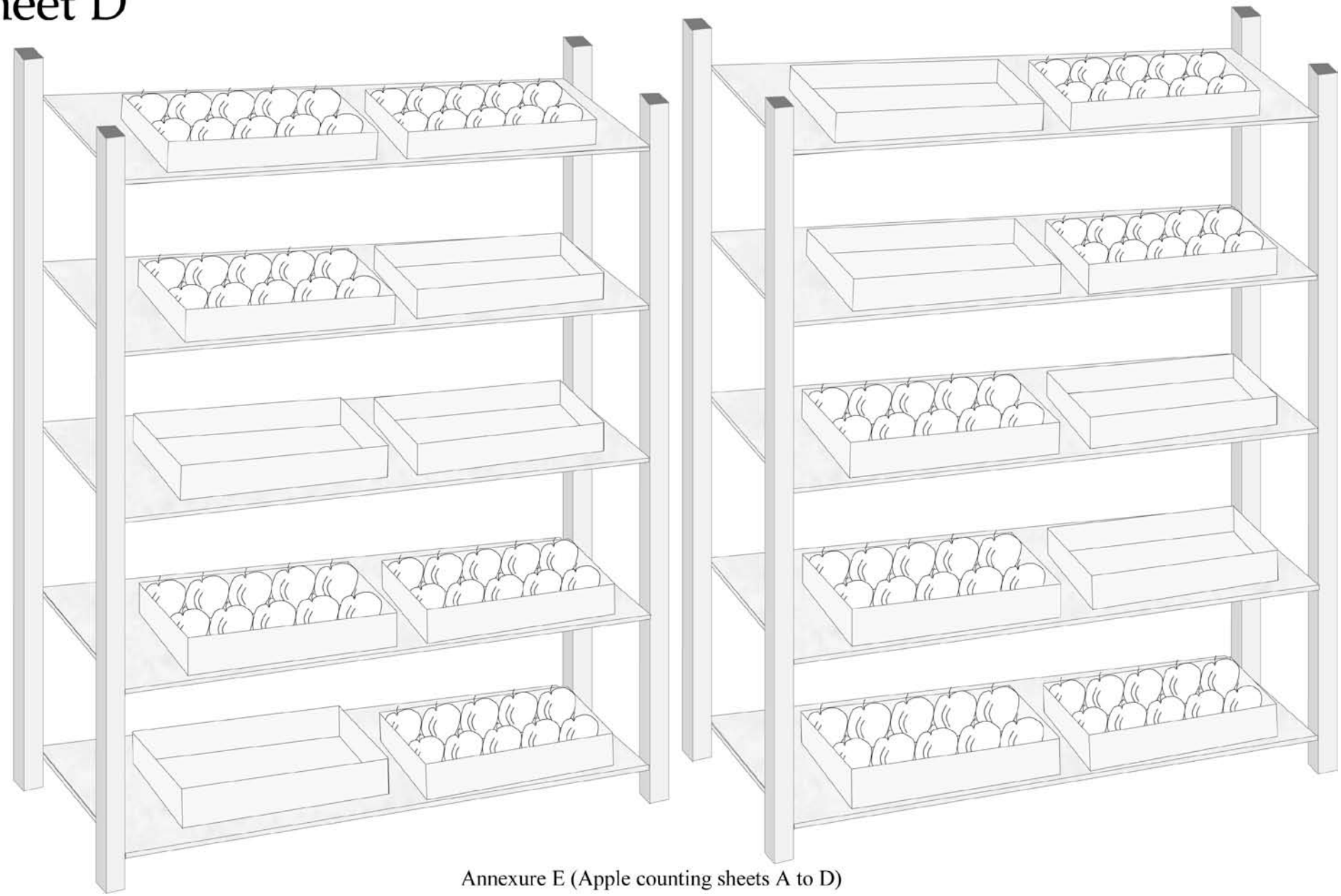
Sheet B



Annexure E (Apple counting sheets A to D)

Annexure E (Apple counting sheets A to D)

Sheet D



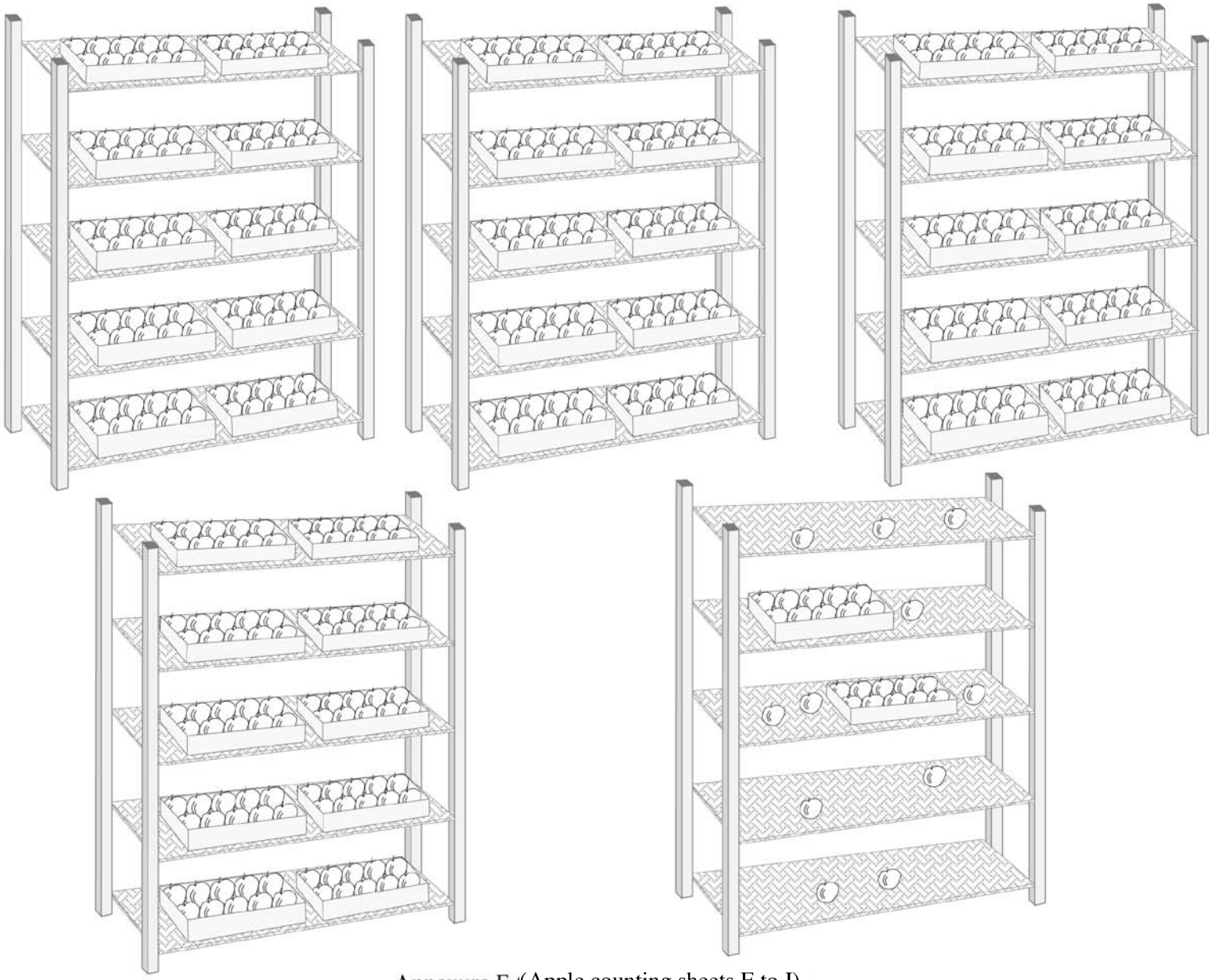
Annexure E (Apple counting sheets A to D)

Sheet E



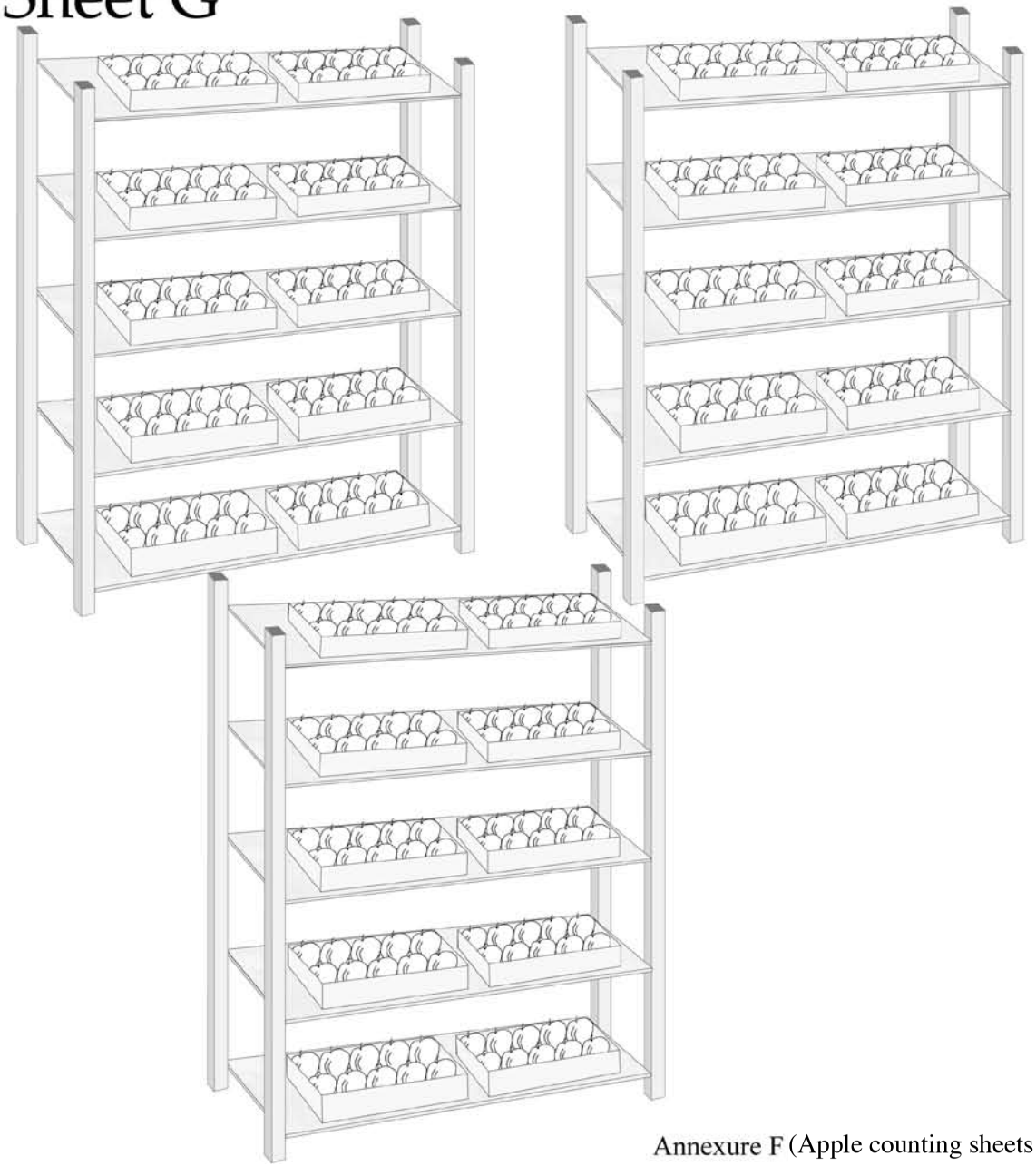
Annexure F (Apple counting sheets E to I)

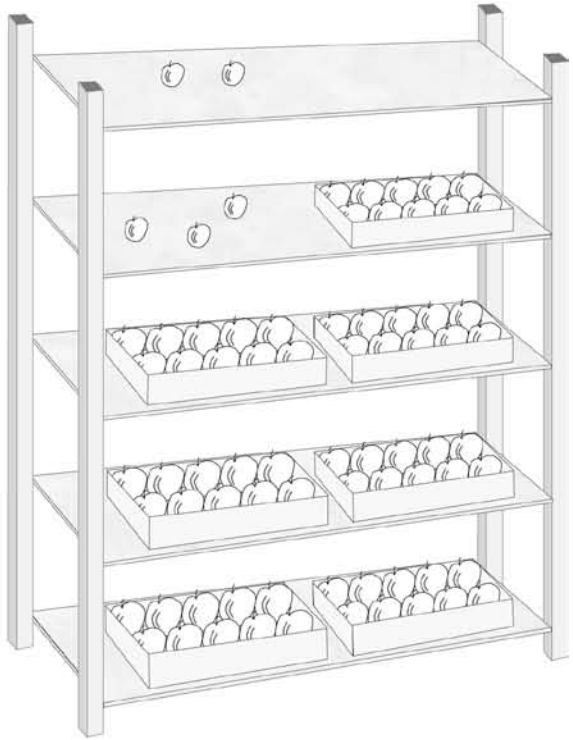
Sheet F



Annexure F ((Apple counting sheets E to I)

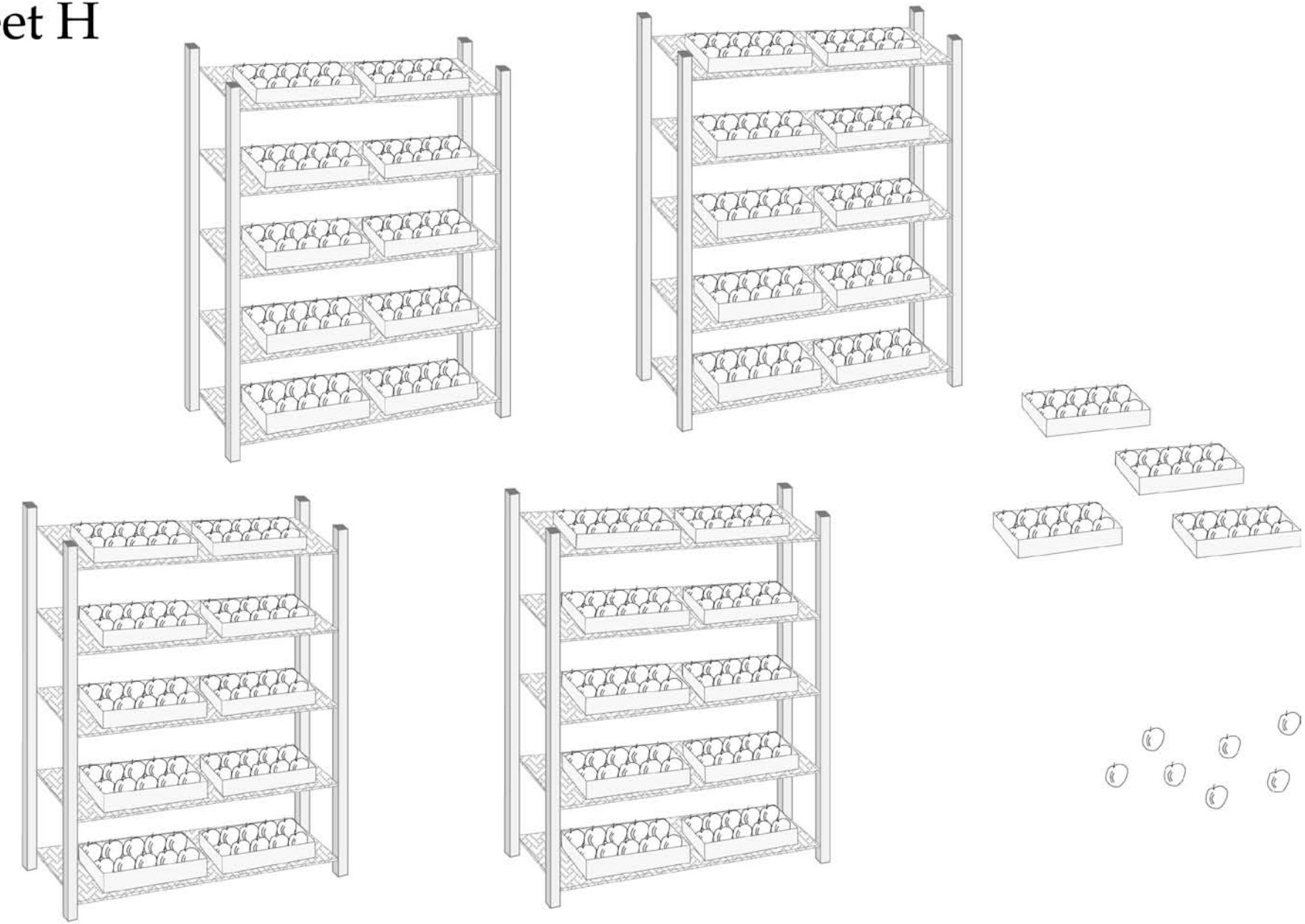
Sheet G





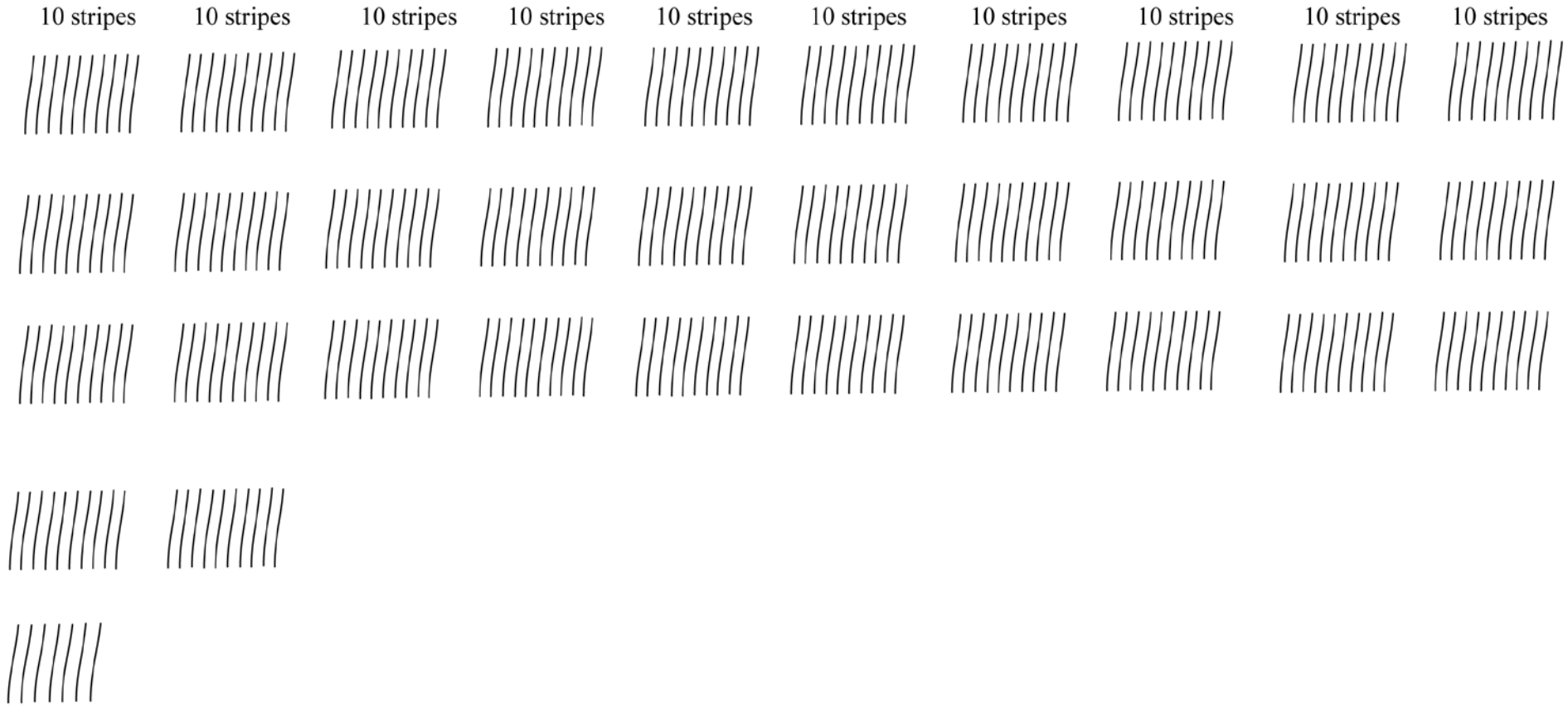
Annexure F (Apple counting sheets E to I)

Sheet H

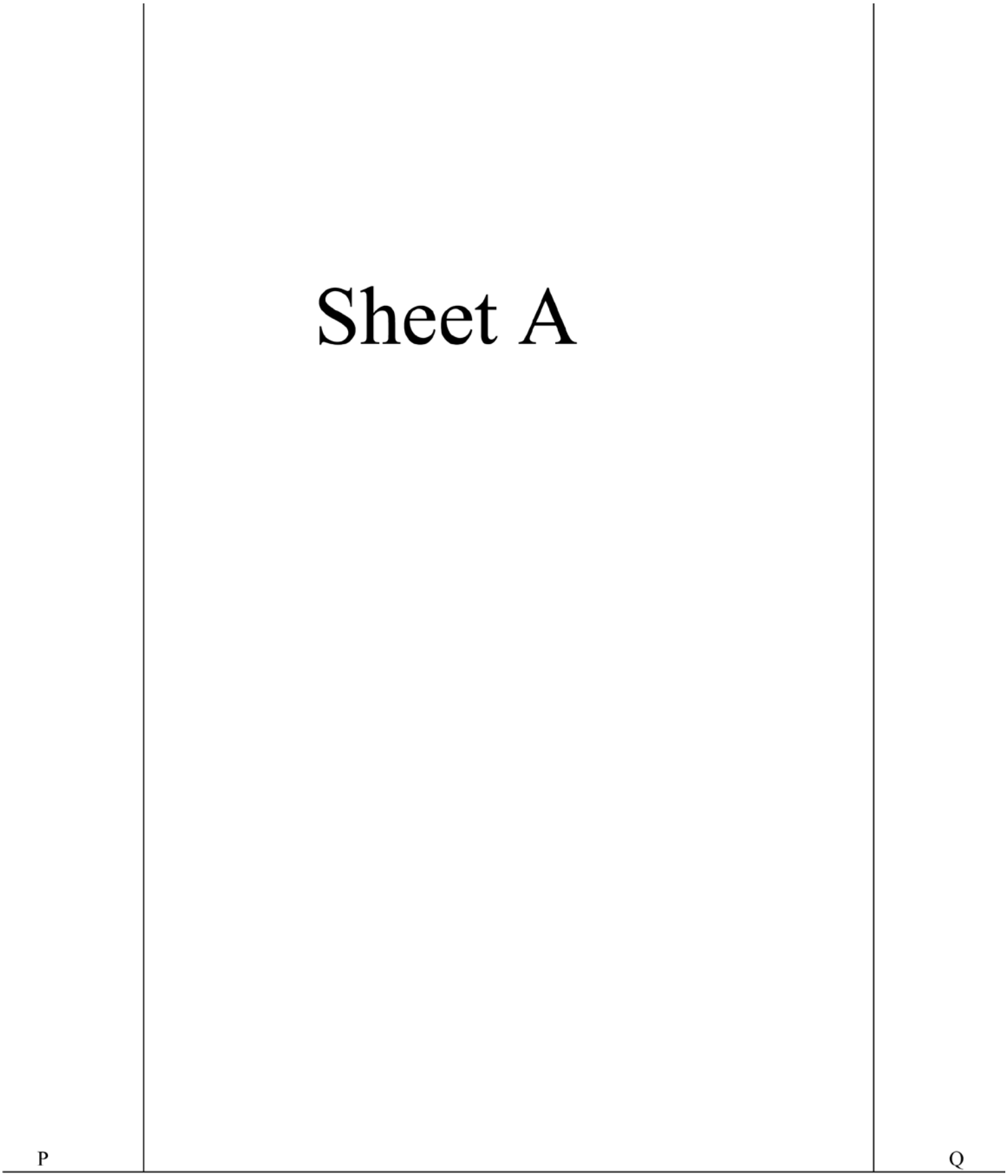


Annexure F (Apple counting sheets E to I)

Sheet I



Annexure F (Apple counting sheets E to I)



Annexure G (Prism tube template)

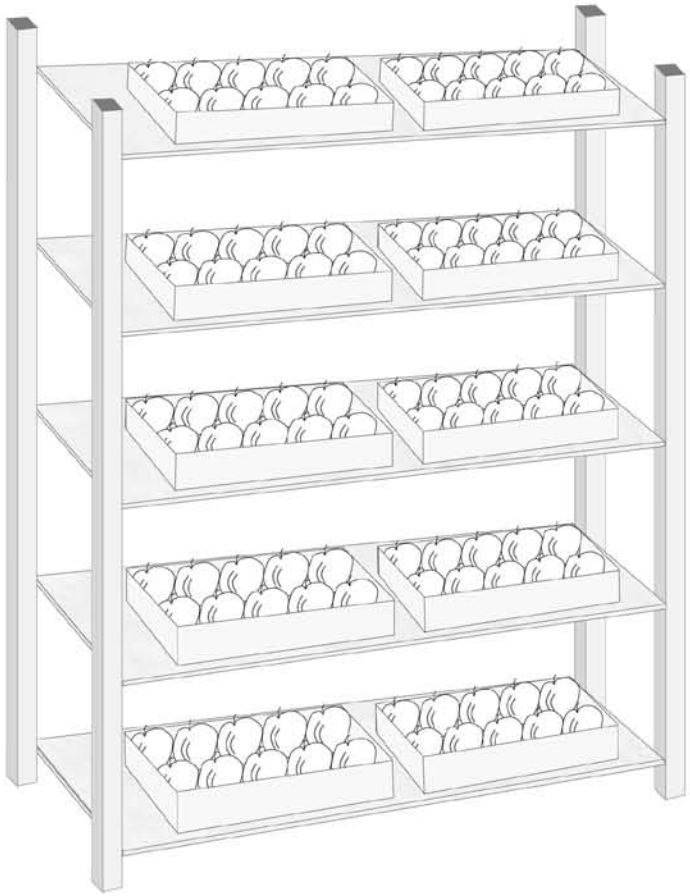
Sheet B

P

Annexure G (Prism tube template)

Q

Sheet J



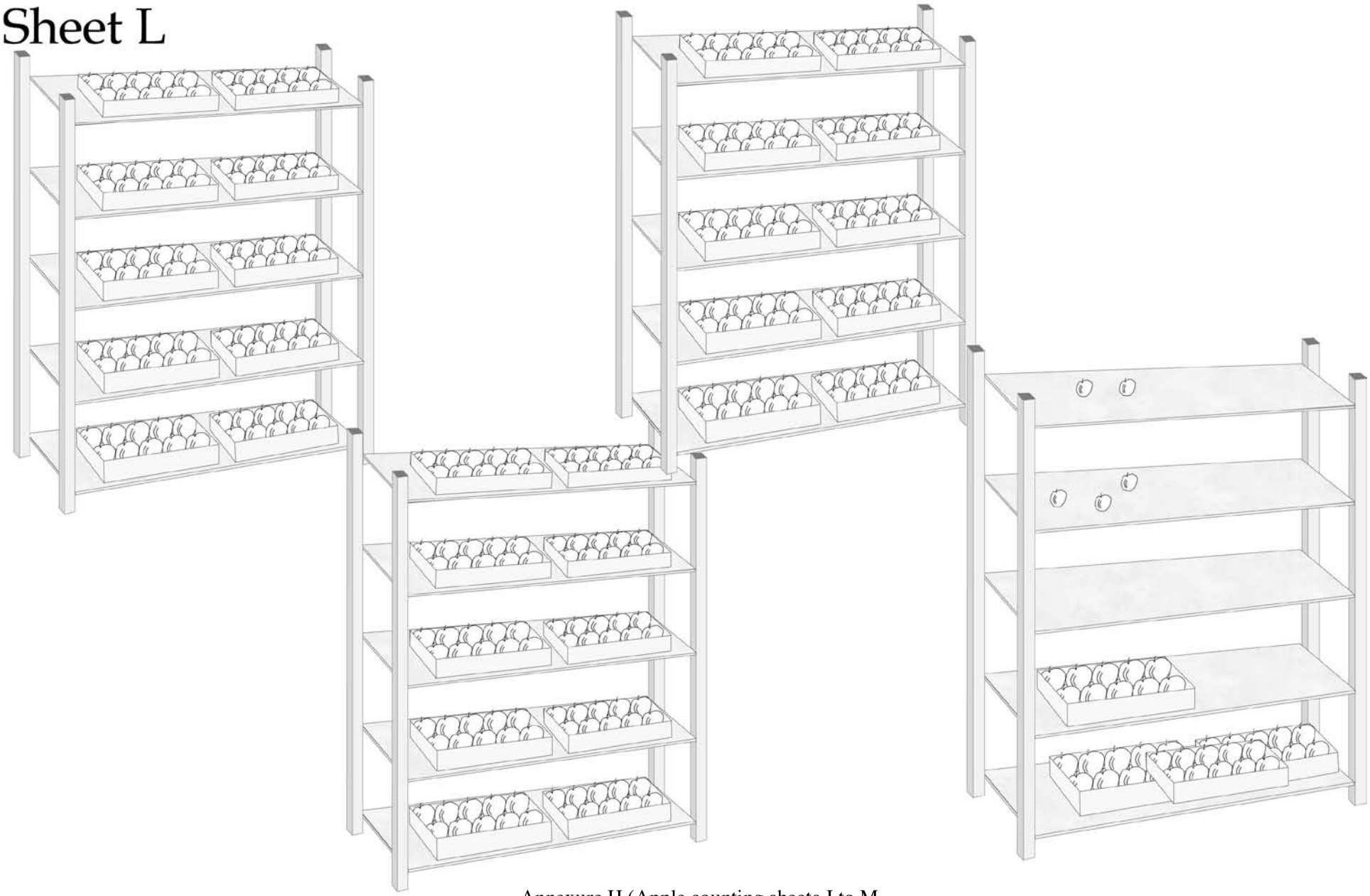


Annexure H (Apple counting sheets J to M

Annexure H (Apple counting sheets J to M

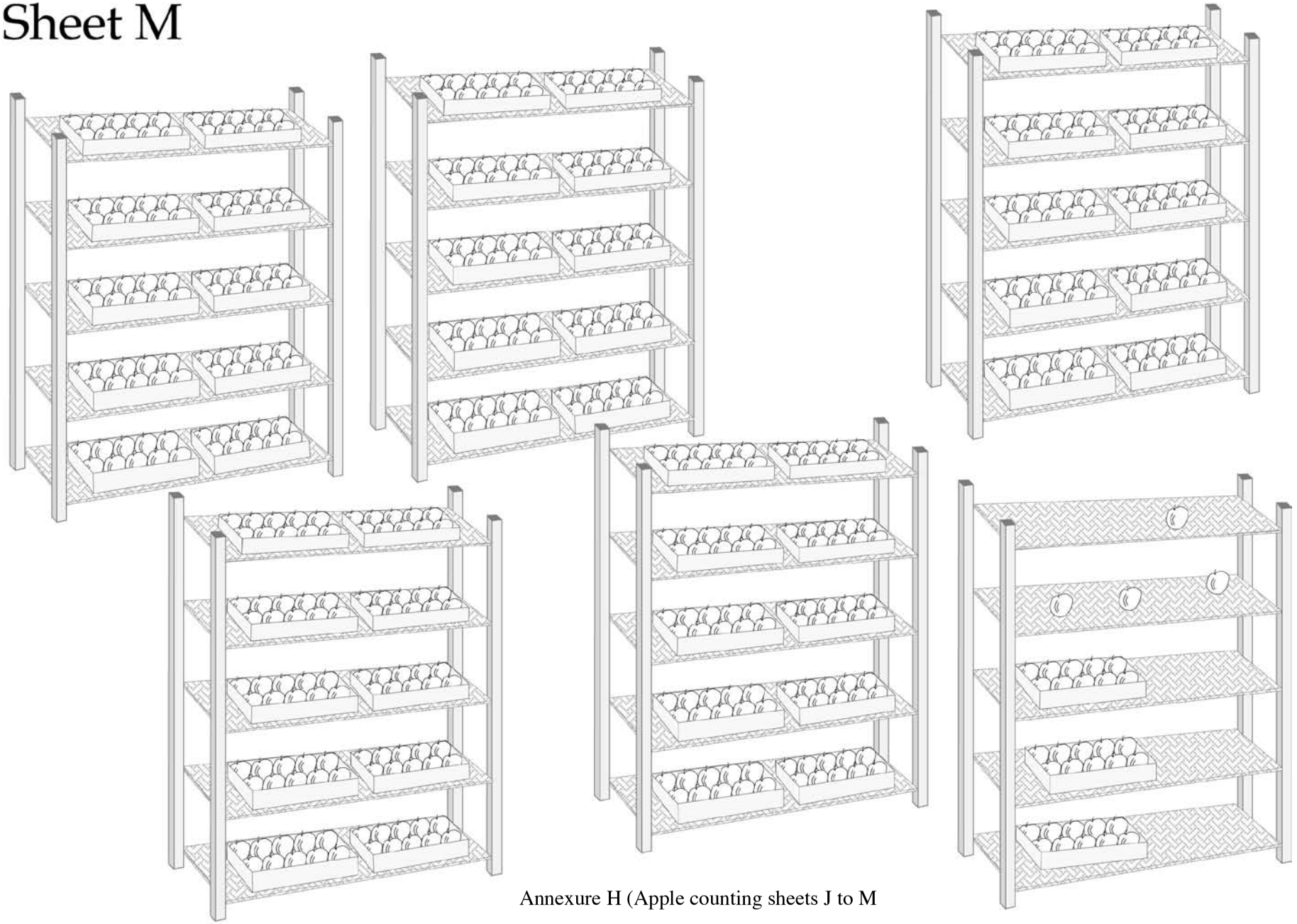
Sheet K

Sheet L



Annexure H (Apple counting sheets J to M

Sheet M



Annexure H (Apple counting sheets J to M

Your name: Worksheet 1 on writing numbers.

Write each number in the short way (the condensed notation), and in words:

500 + 60 + 7

200 + 80 + 4

700 + 80 + 9

300 + 60 + 18

400 + 120 + 8

200 + 160 + 15

500 + 170 + 13

600 + 110 + 17

Write each number in expanded notation (the long way), and in the short way (condensed notation):

Four hundred and ninety-seven

Seven hundred and fourty-eight

Five hundred and nine

Eight hundred and ninety

Write each number in words and in expanded notation

348

921

753

387

408

520

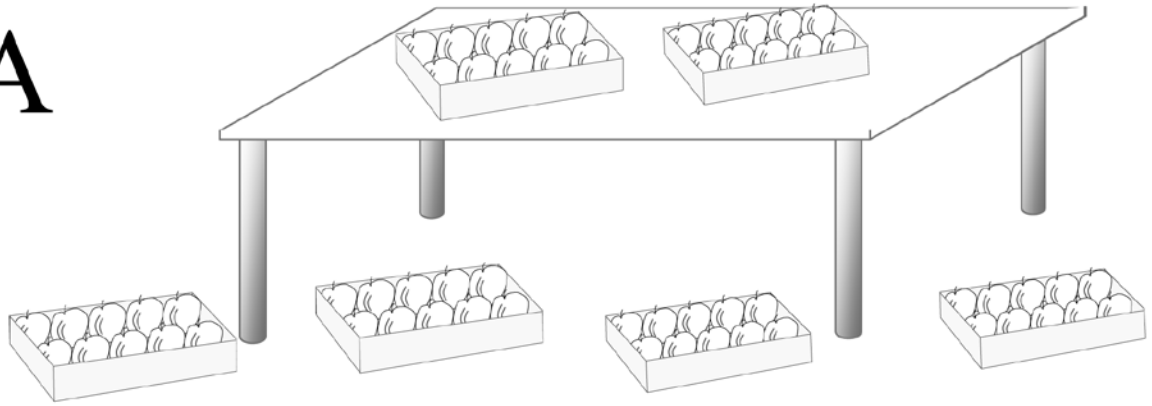
901

910

911

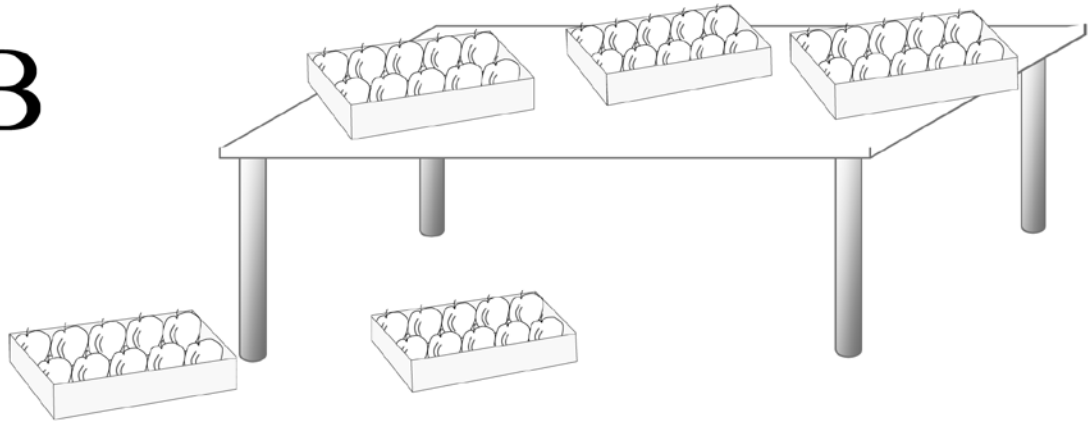
Annexure J (Number writing worksheets)

A



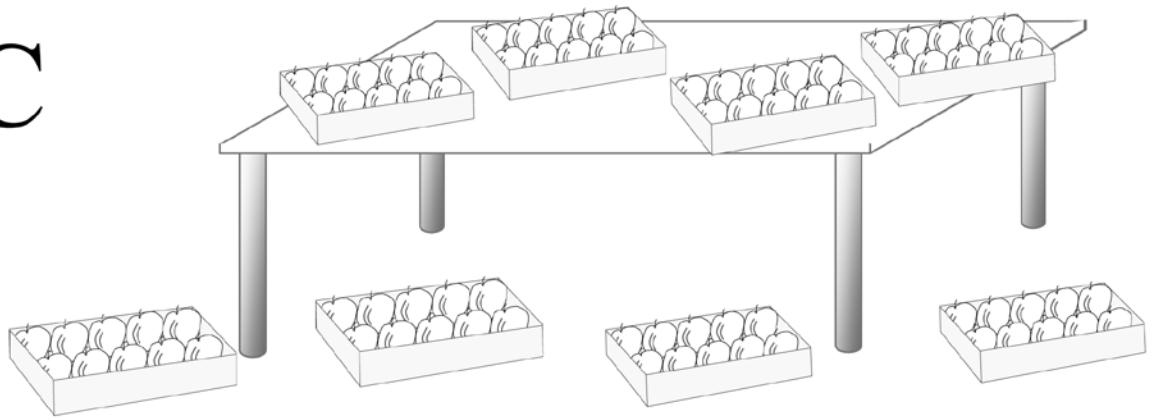
How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

B



How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

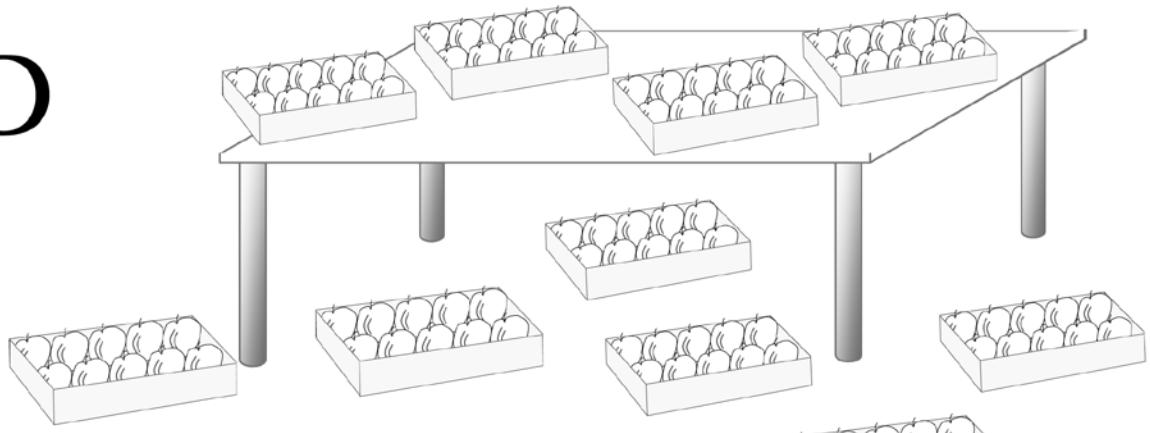
C



How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

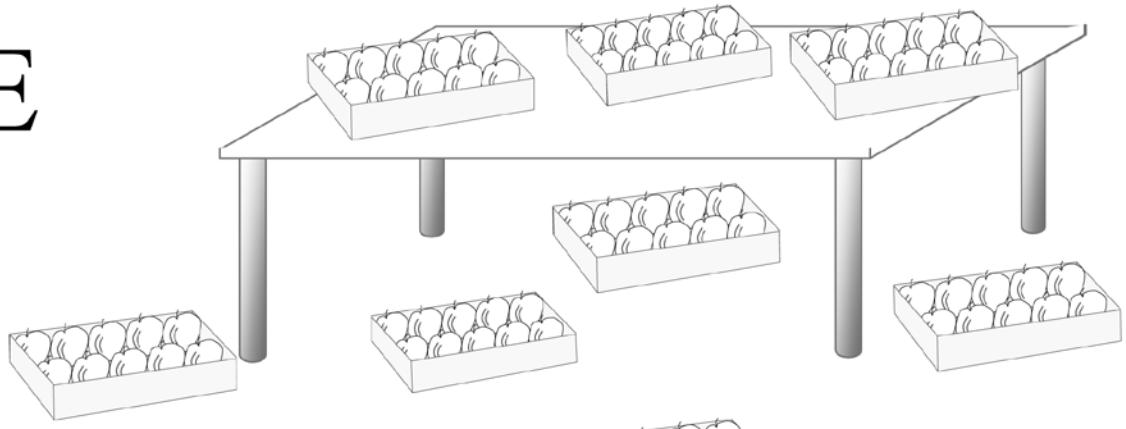
Annexure K (Picture multiples of ten)

D



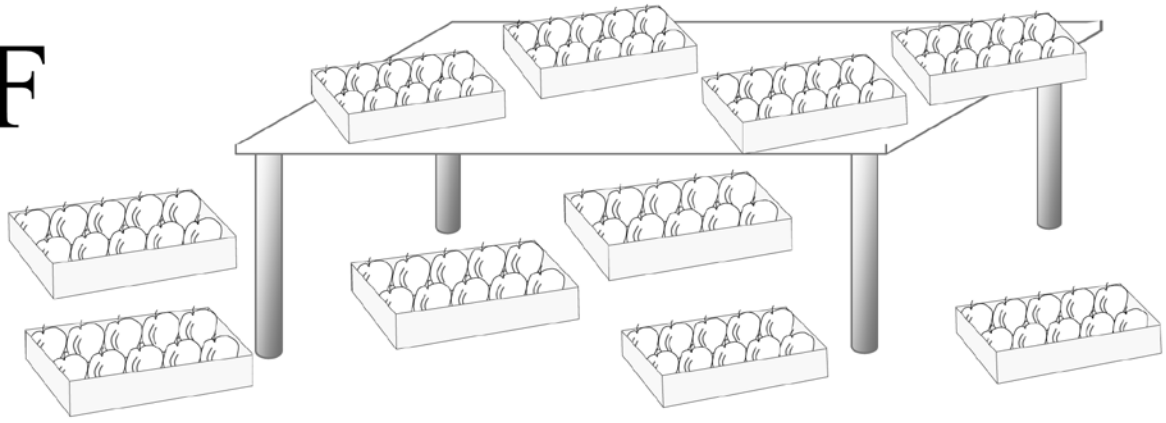
How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

E



How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

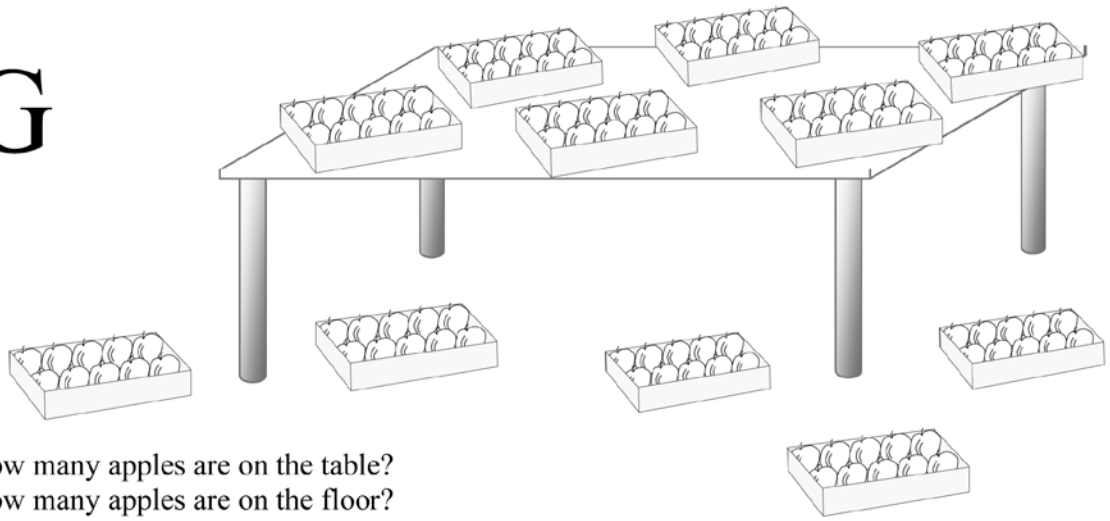
F



How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

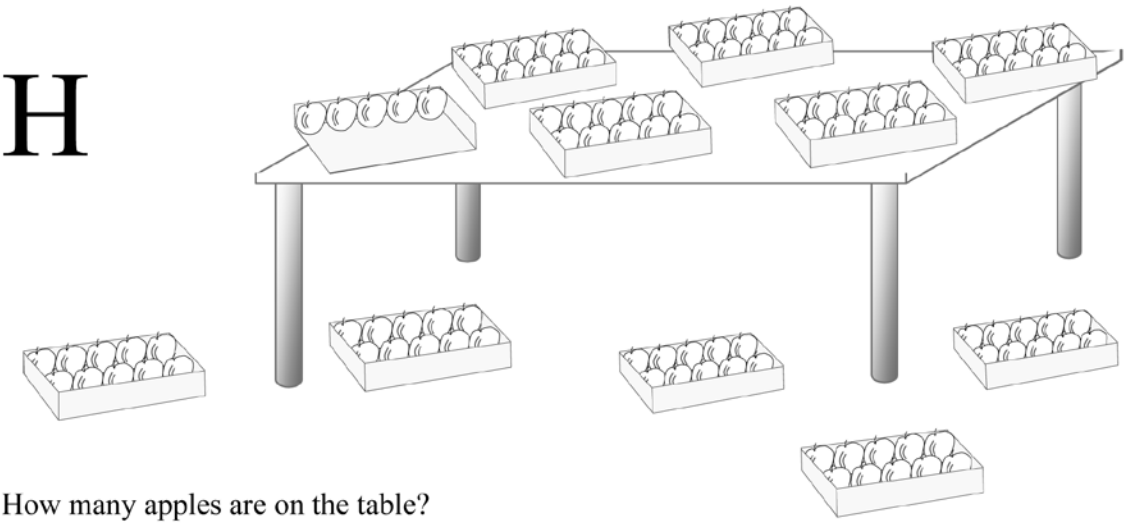
Annexure K (Picture multiples of ten)

G



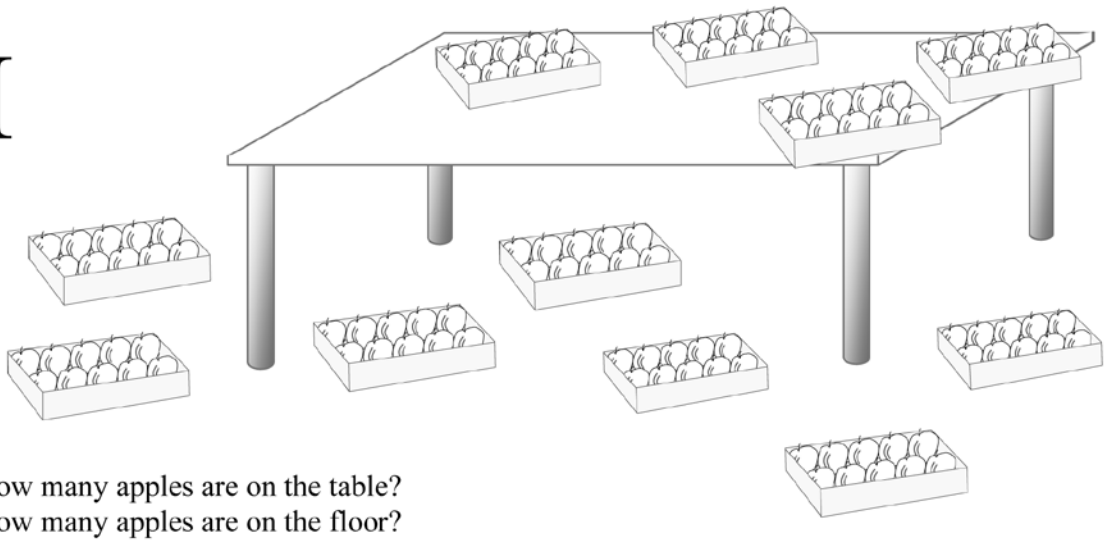
How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

H



How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

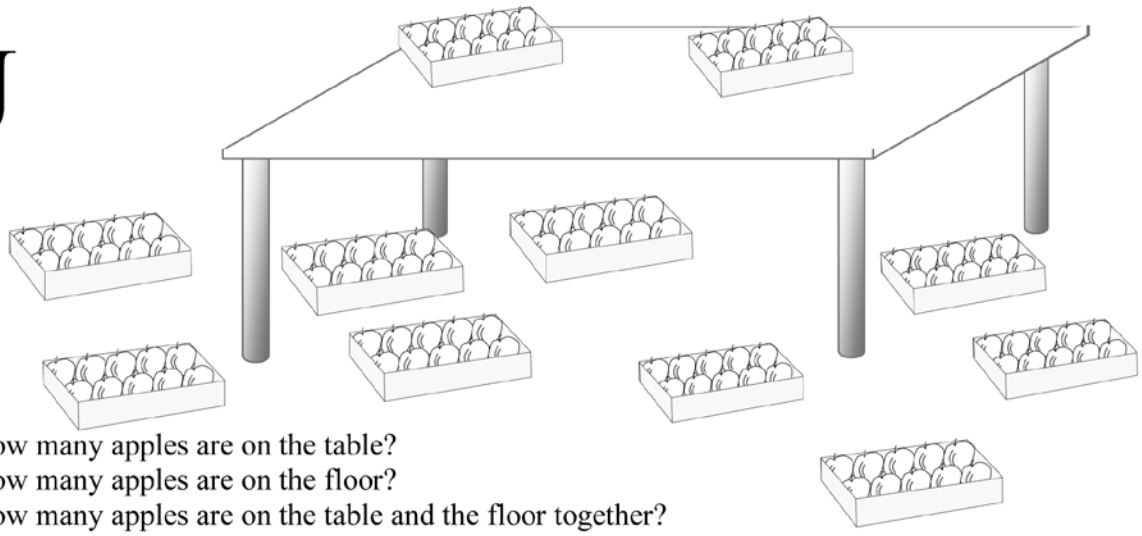
I



How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

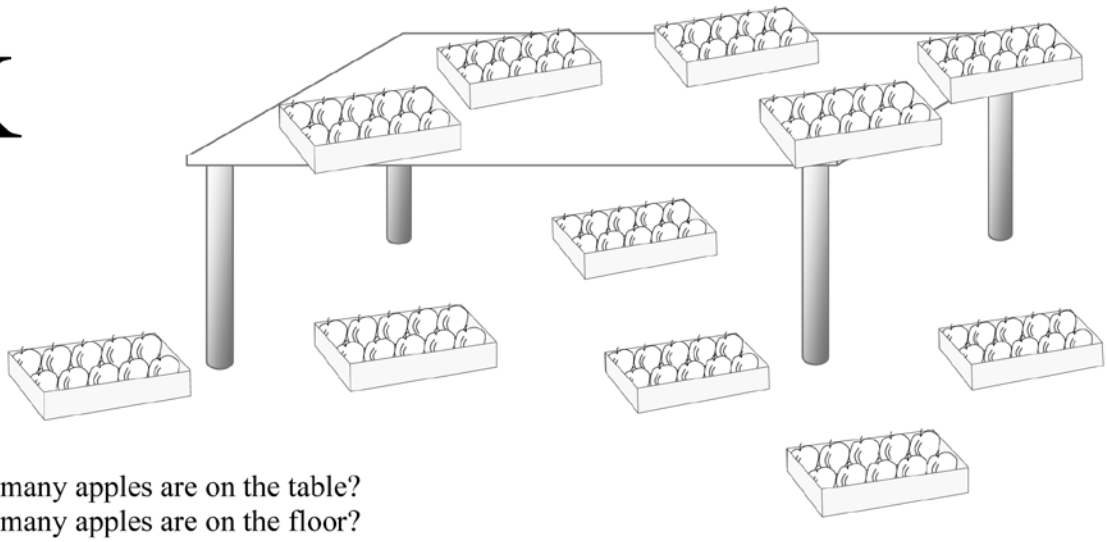
Annexure K (Picture multiples of ten)

J



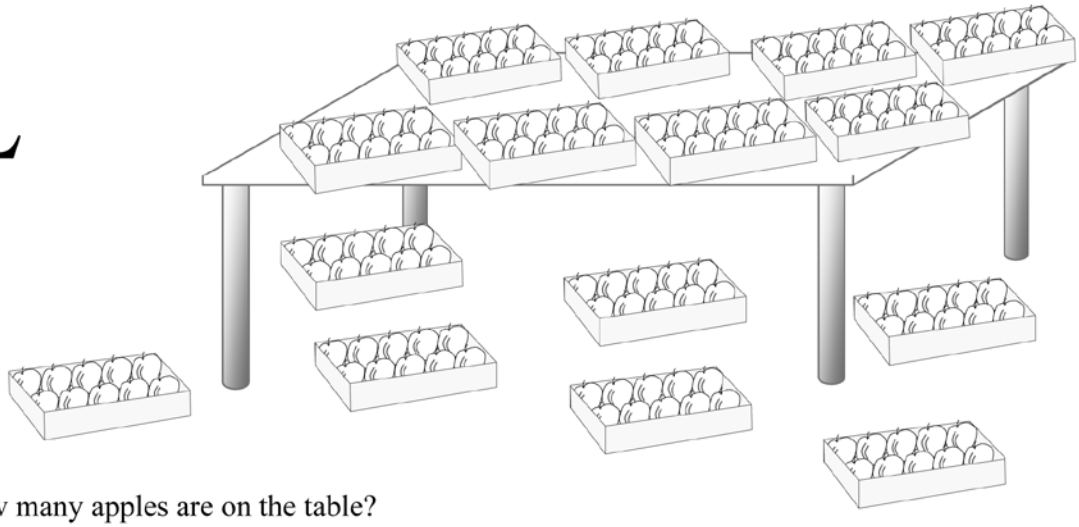
How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

K



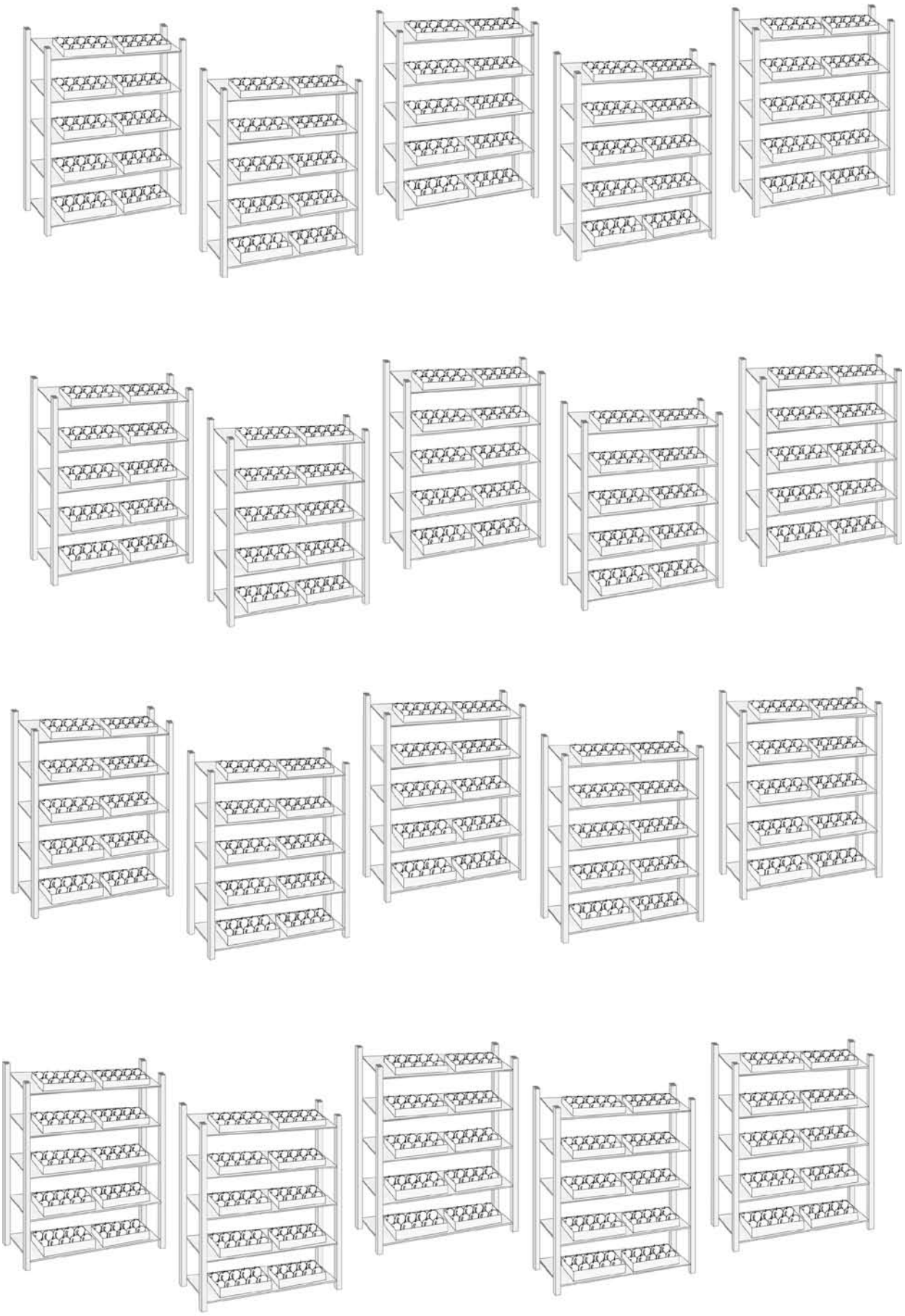
How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

L

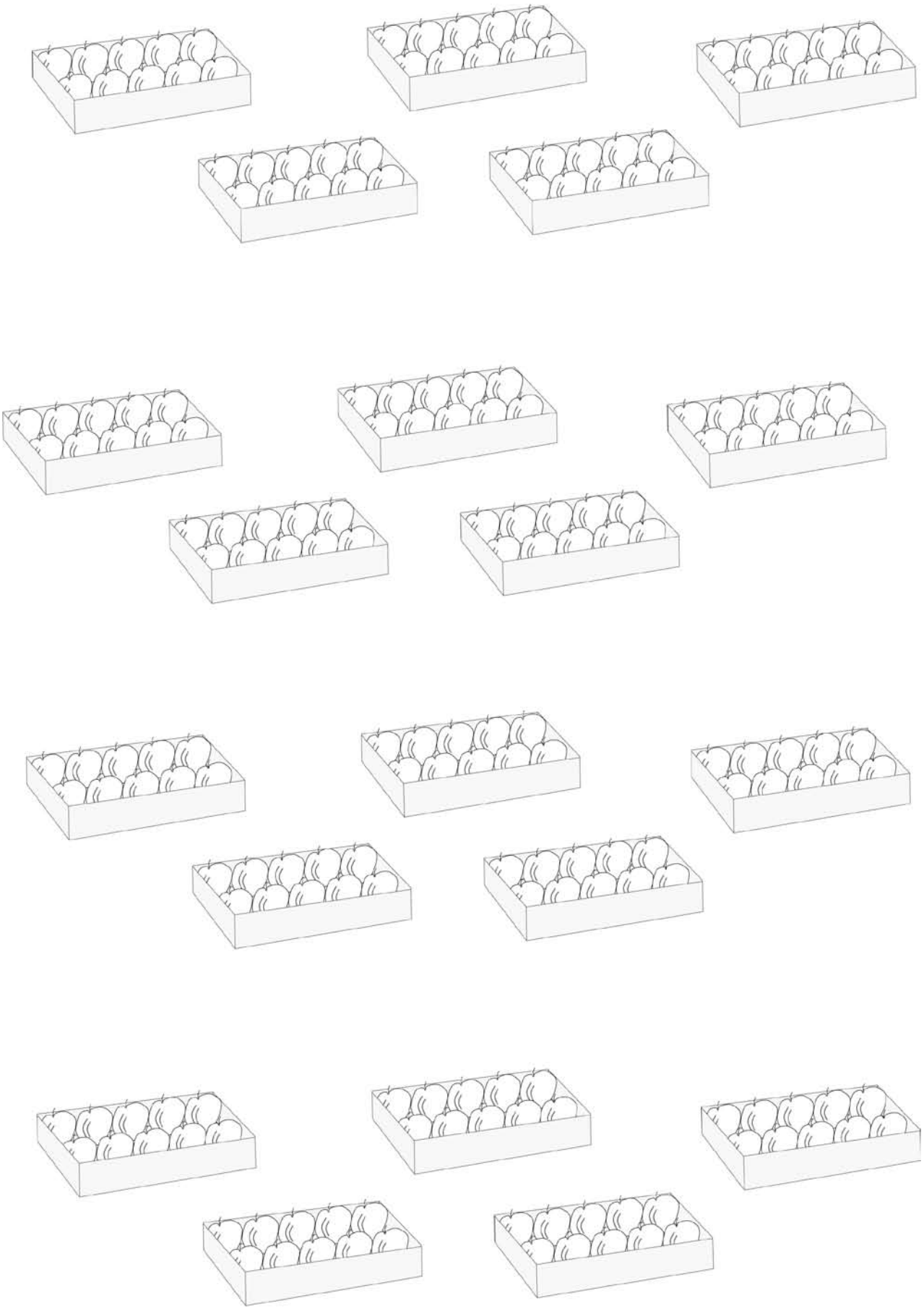


How many apples are on the table?
How many apples are on the floor?
How many apples are on the table and the floor together?

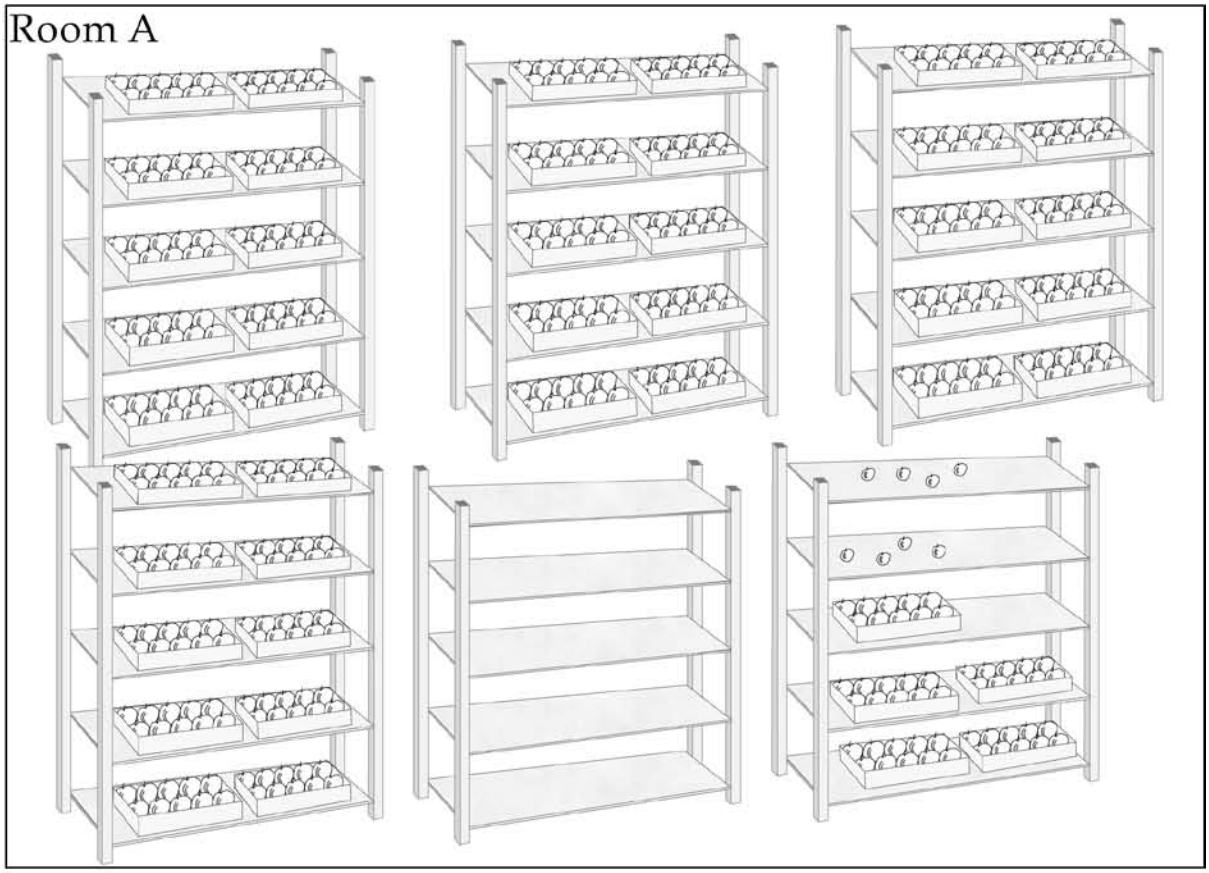
Annexure K (Picture multiples of ten)

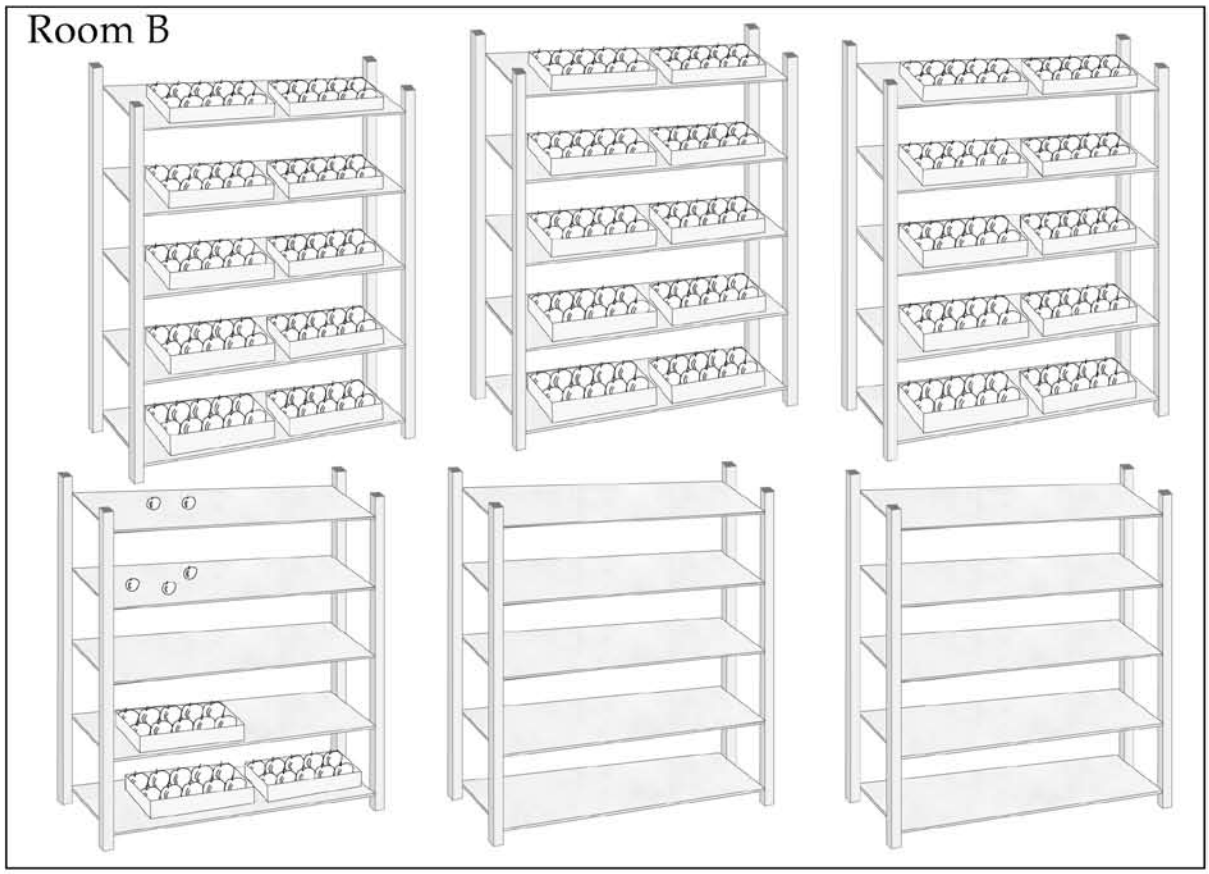


Annexure L (Multiples of ten and hundred)

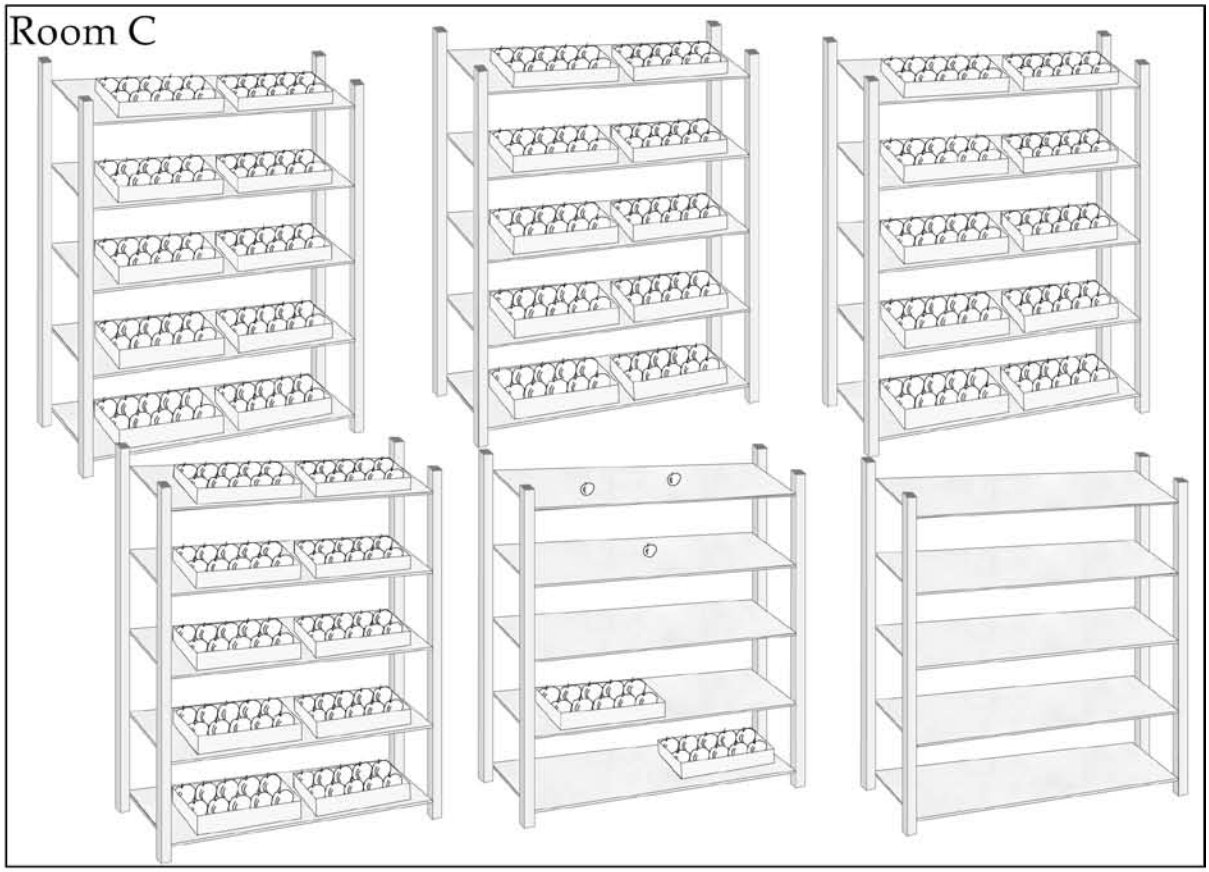


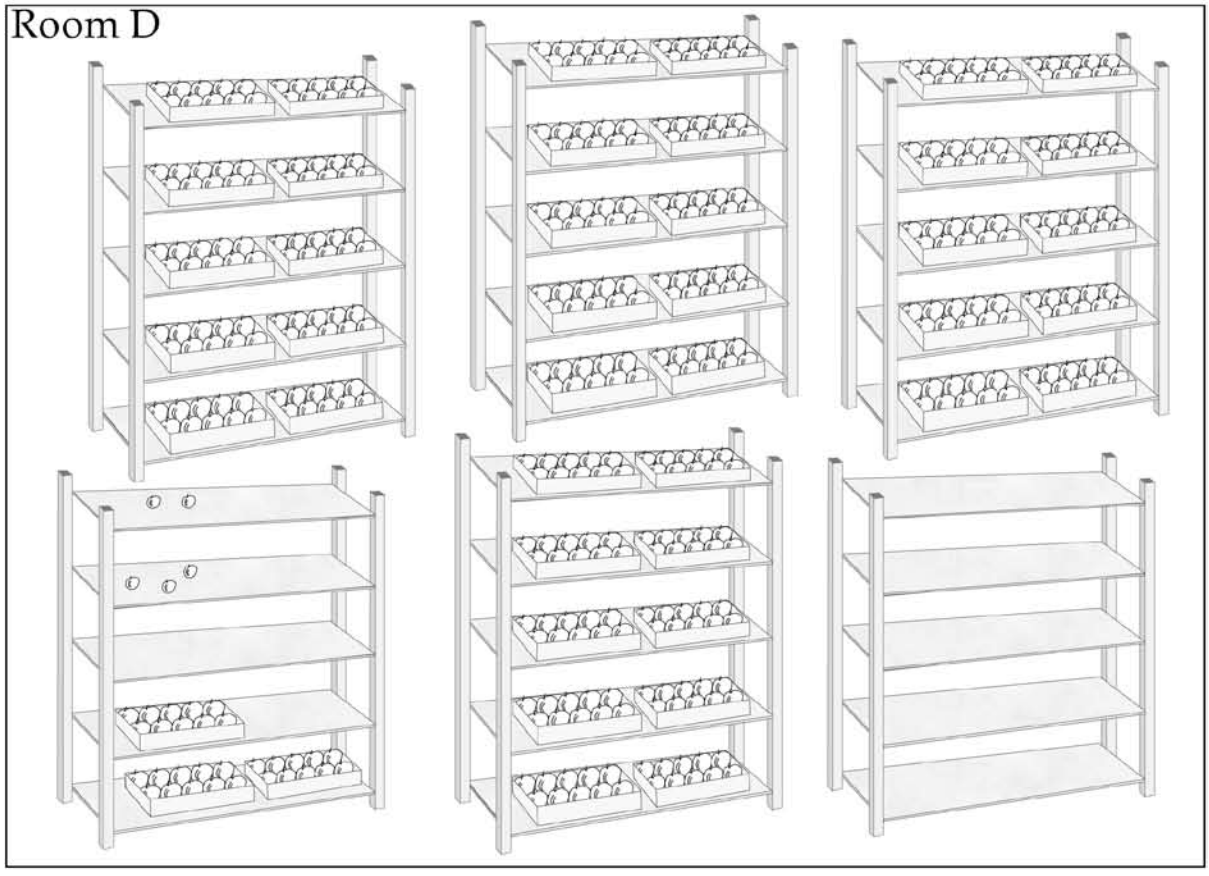
Annexure L (Multiples of ten and hundred)



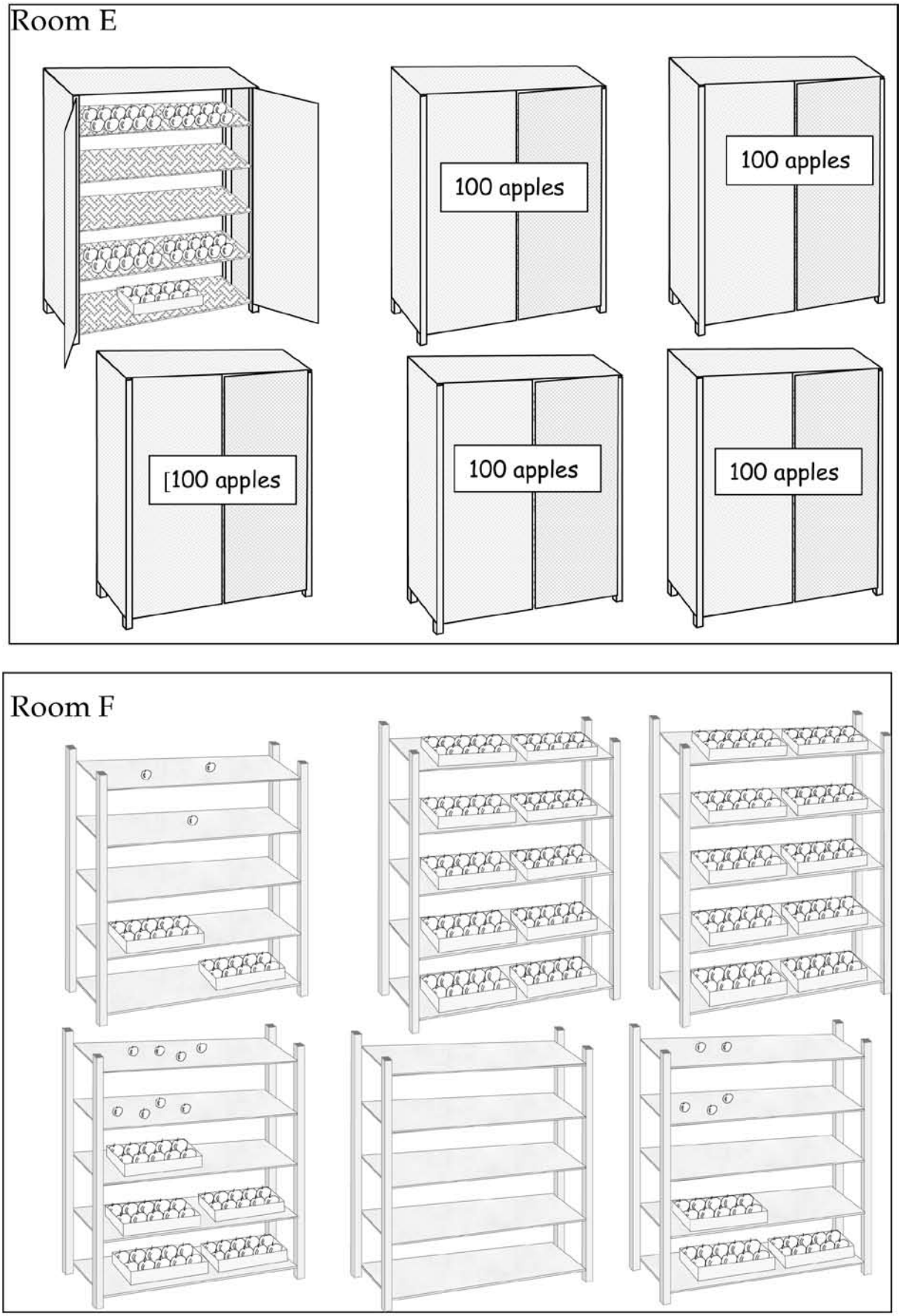


Annexure M (Apple rooms)





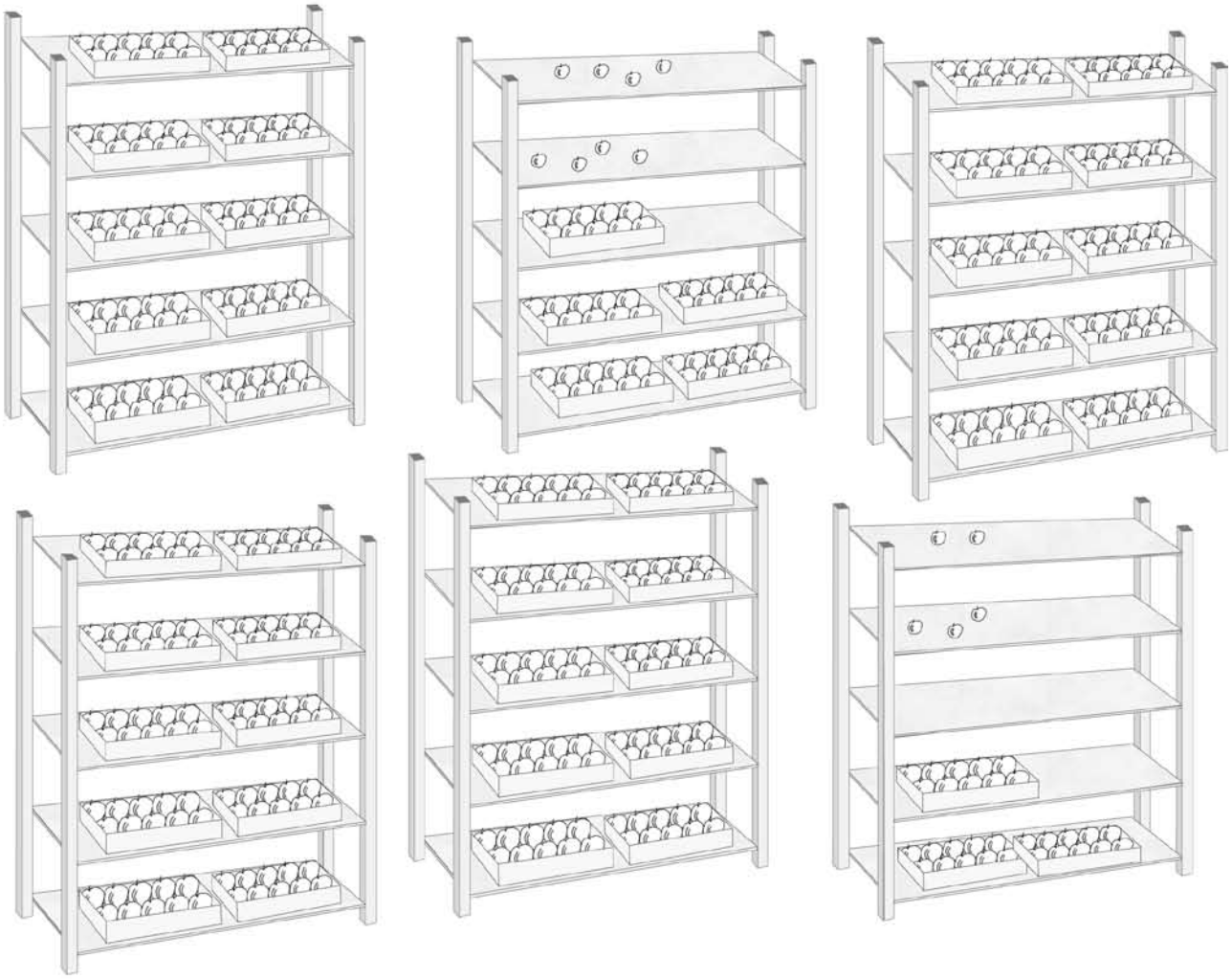
Annexure M (Apple rooms)



Annexure M (Apple rooms)

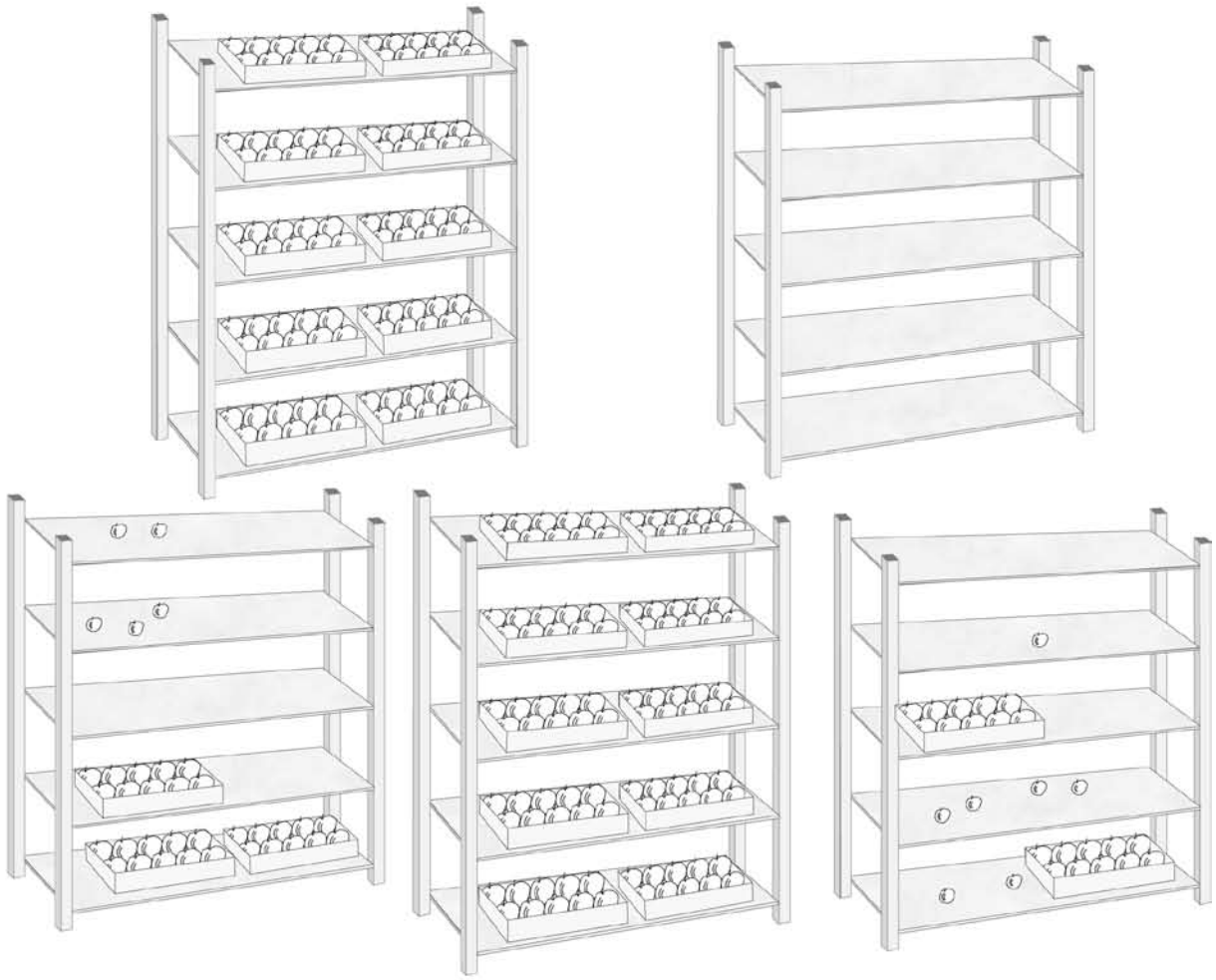
Your name:

1. How many apples are shown on this page?



2. How many apples are shown on this page and the next page together?

Annexure N (Assessment task)



3. How many more apples are needed to fill the racks on this page, so that there are 500 apples?

4. Write each number in the short notation:

   500 + 50 + 8

   400 + 80 + 18

   600 + 130 + 16

Annexure N (Assessment task)

5. Write each number in words:

   782

   807

   870

6. Write each number in expanded notation:

   382

   902

   920

7. How much is each of the following

   40 + 50

   300 + 600

   R245 + R563

   R588 + R367

Annexure N (Assessment task)



Annexure O (Fake money notes)



Annexure O (Fake money notes)



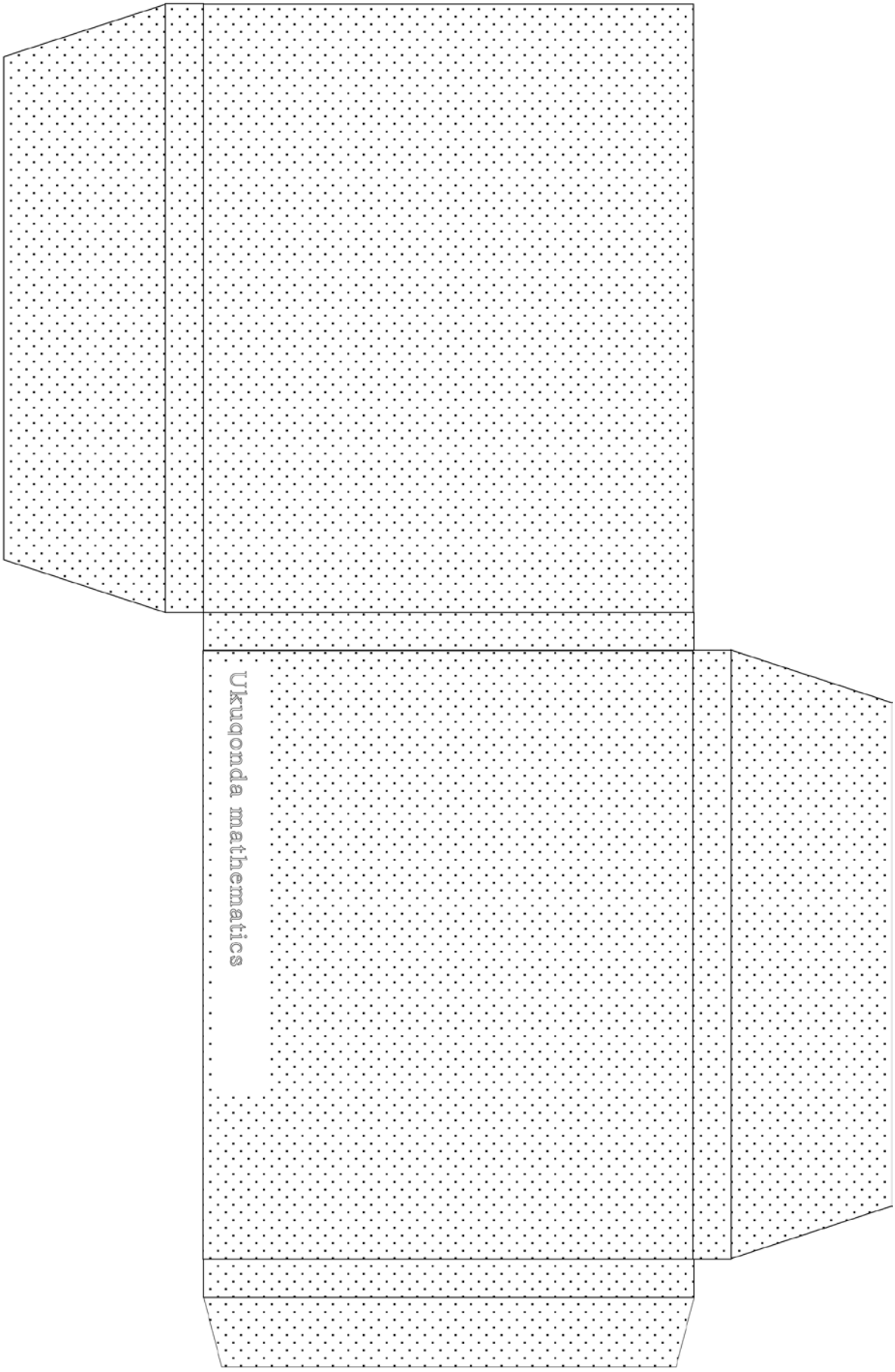
Annexure O (Fake money notes)



Annexure O (Fake money notes)

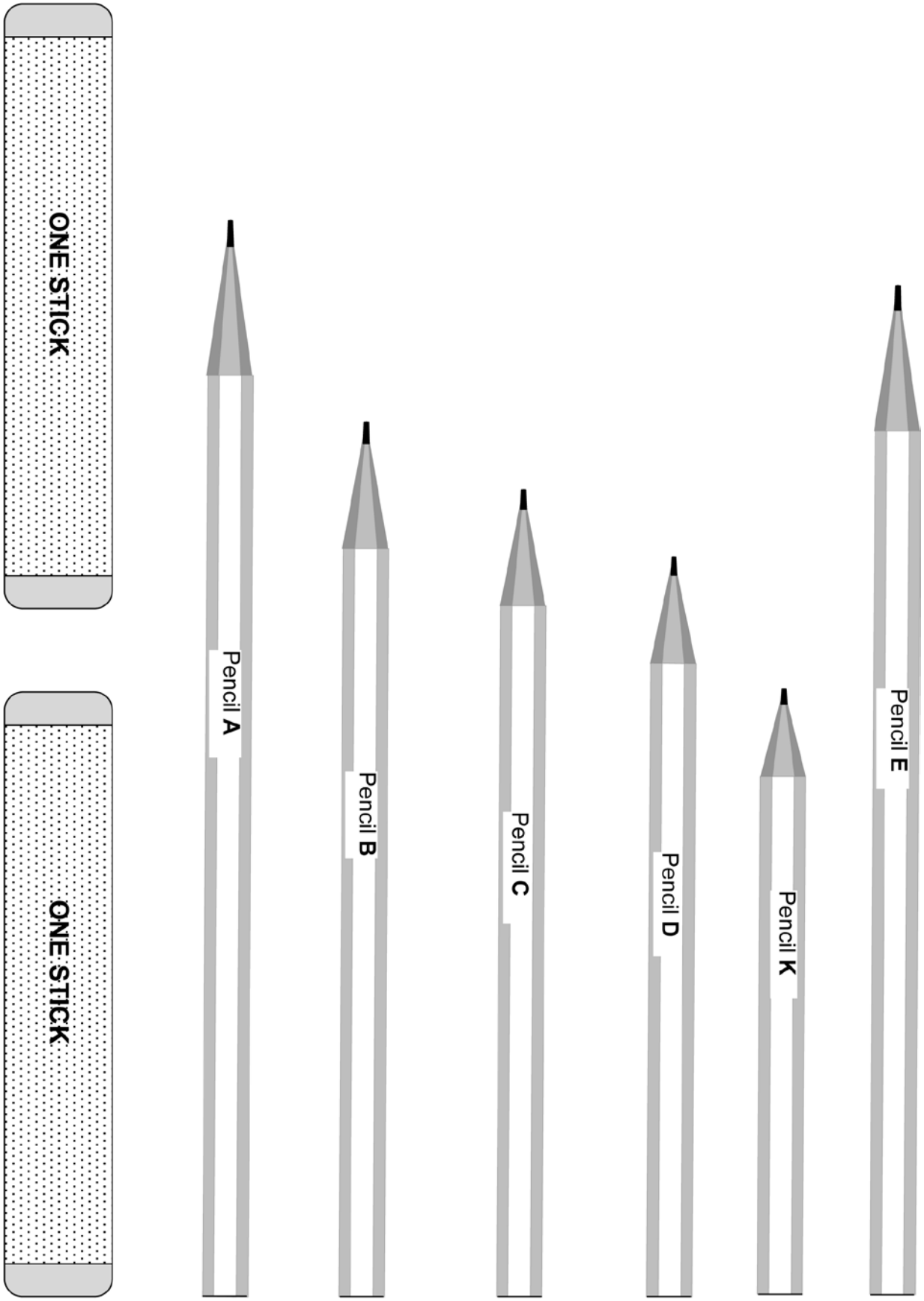


Annexure O (Fake money notes)

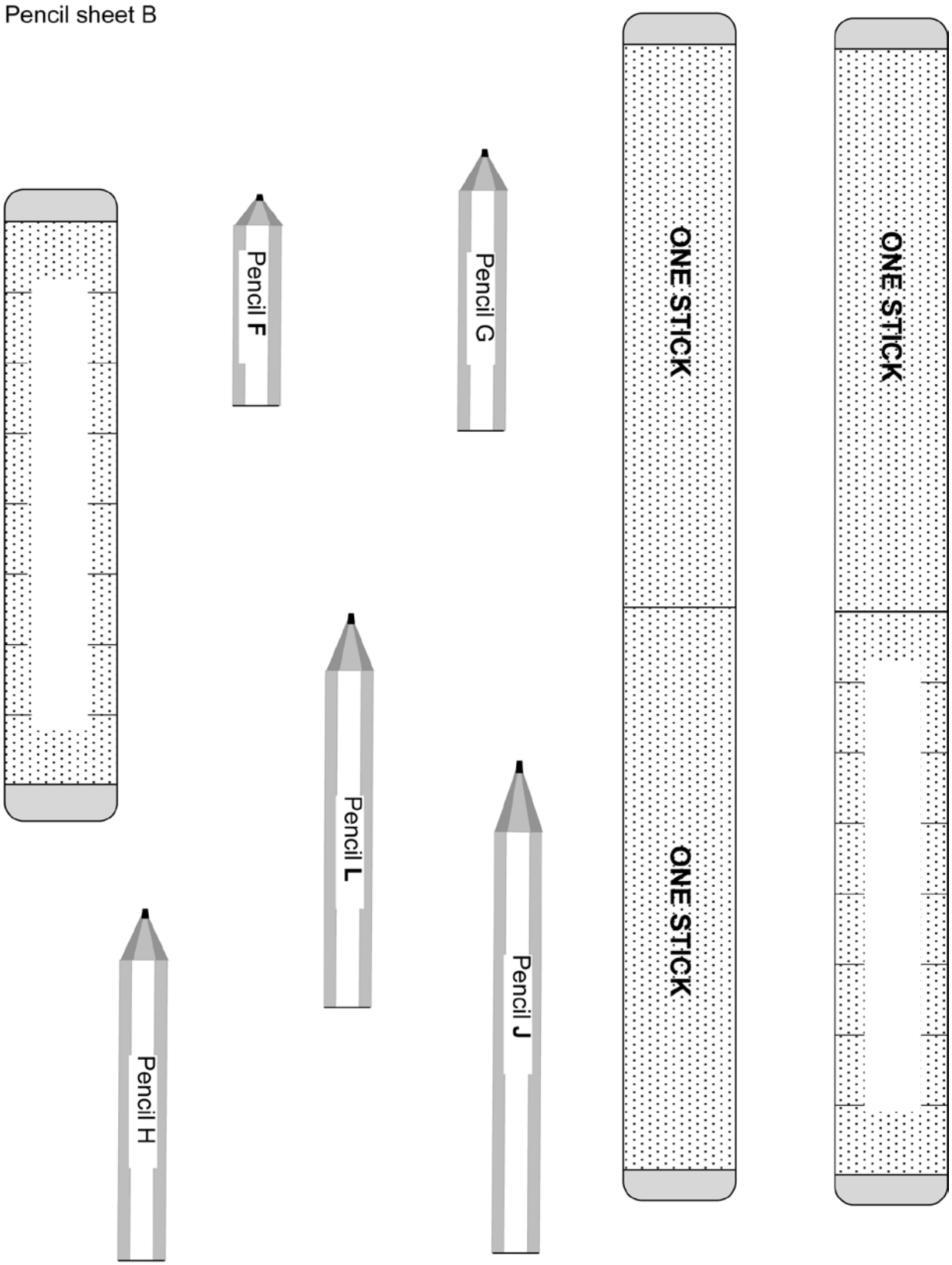


Annexure P (Template flat box)

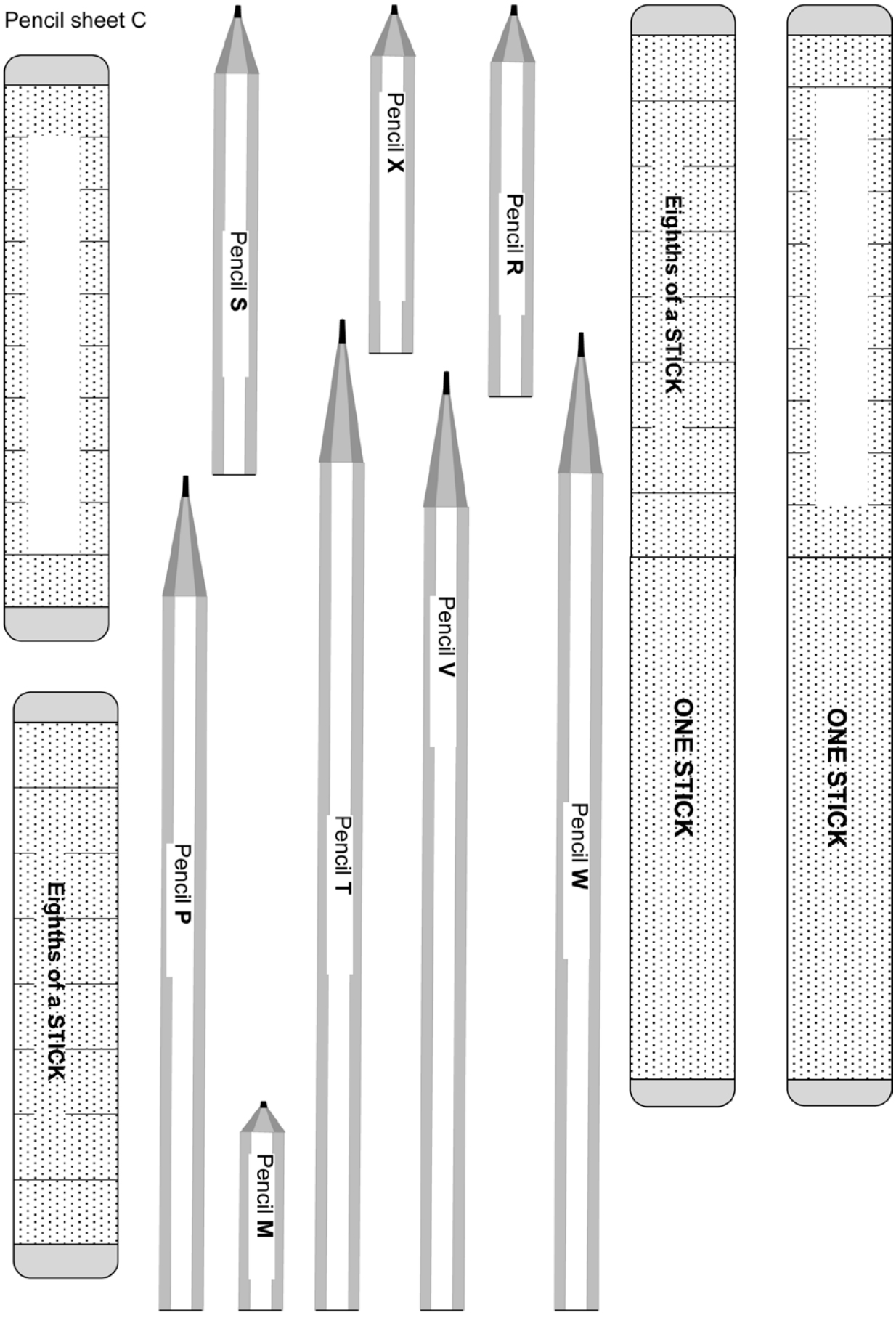
Pencil sheet A



Annexure Q (Fractionrulers)

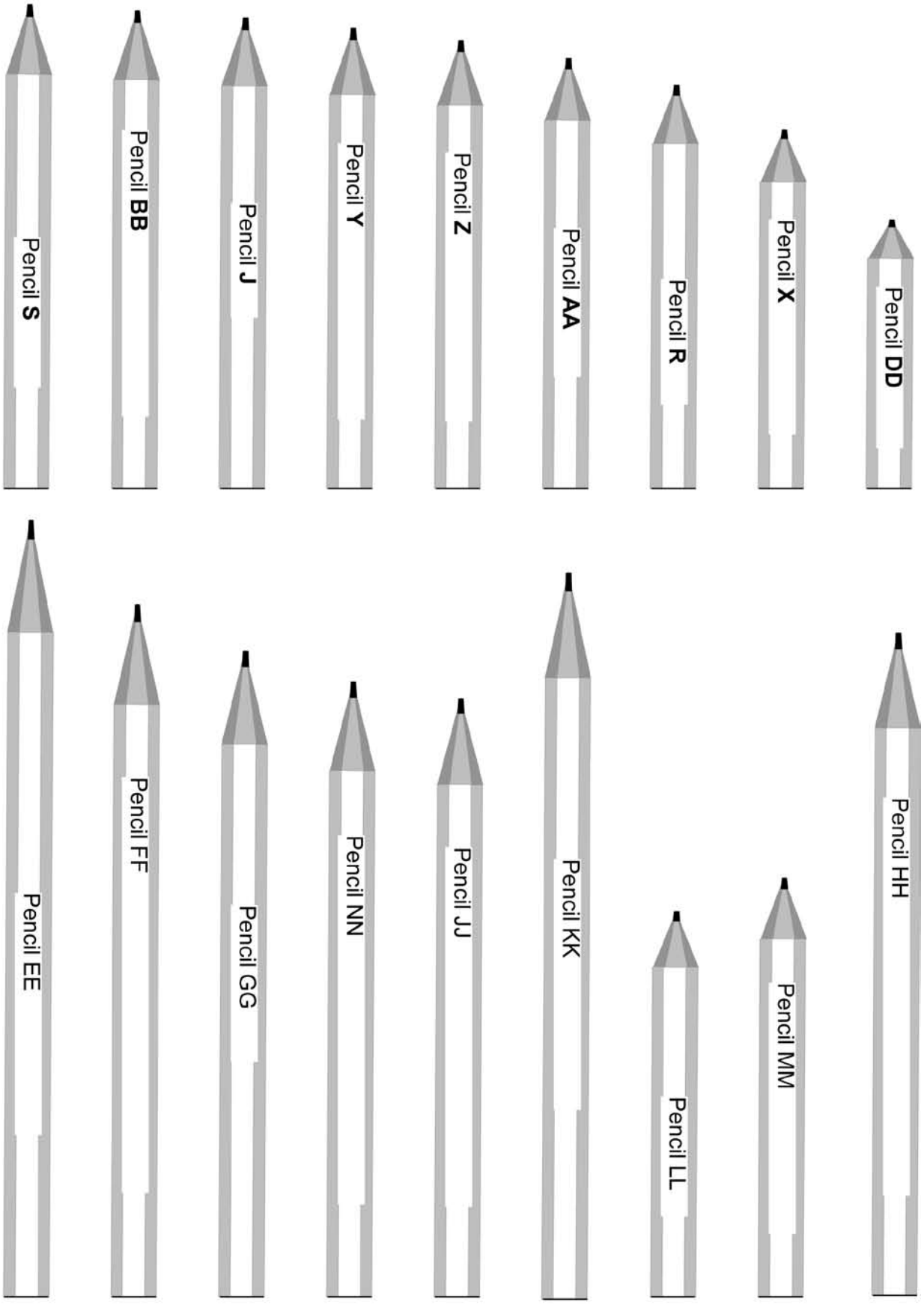


Annexure Q (Fractionrulers)



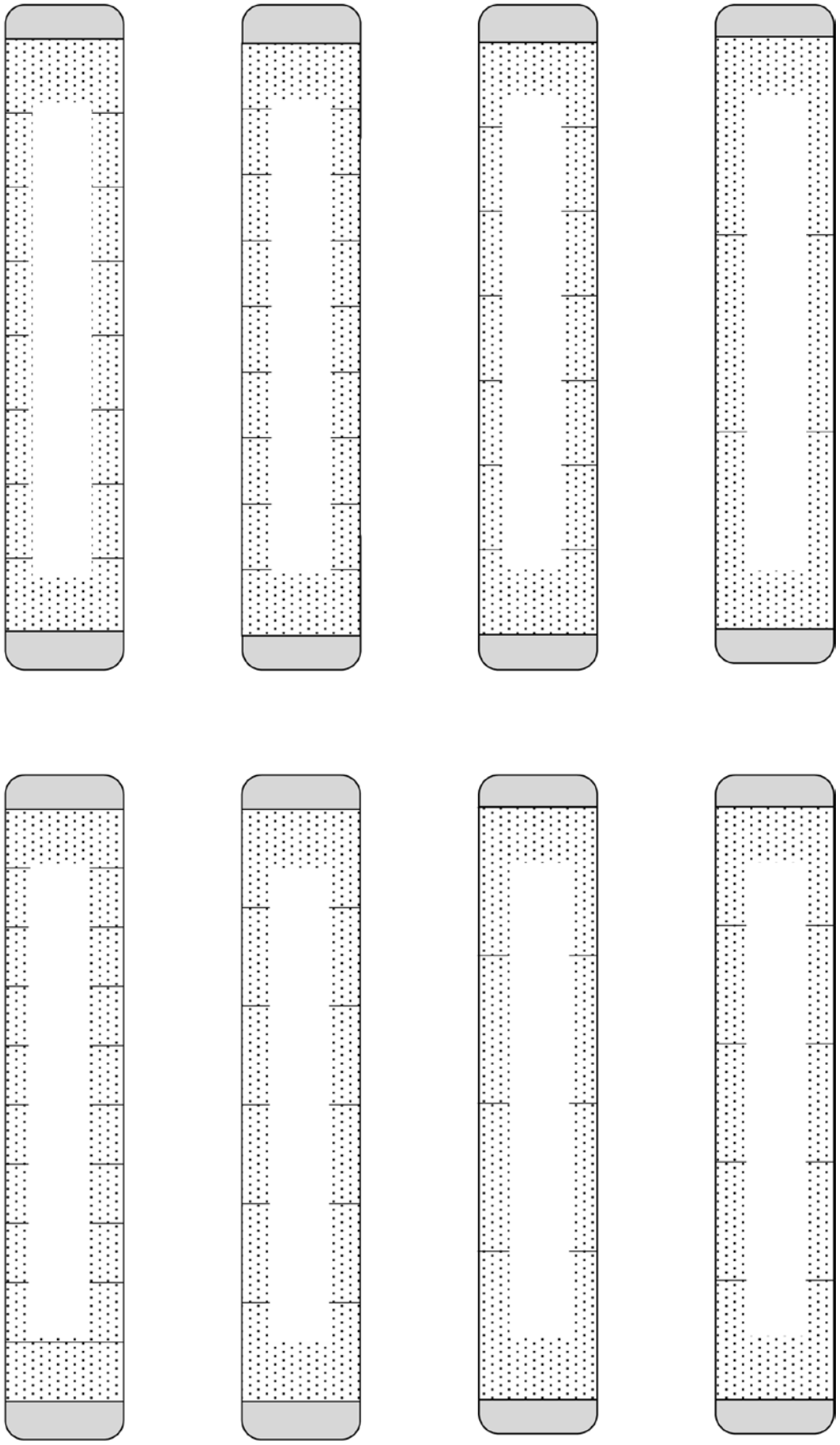
Annexure Q (Fractionrulers)

Pencil sheet D



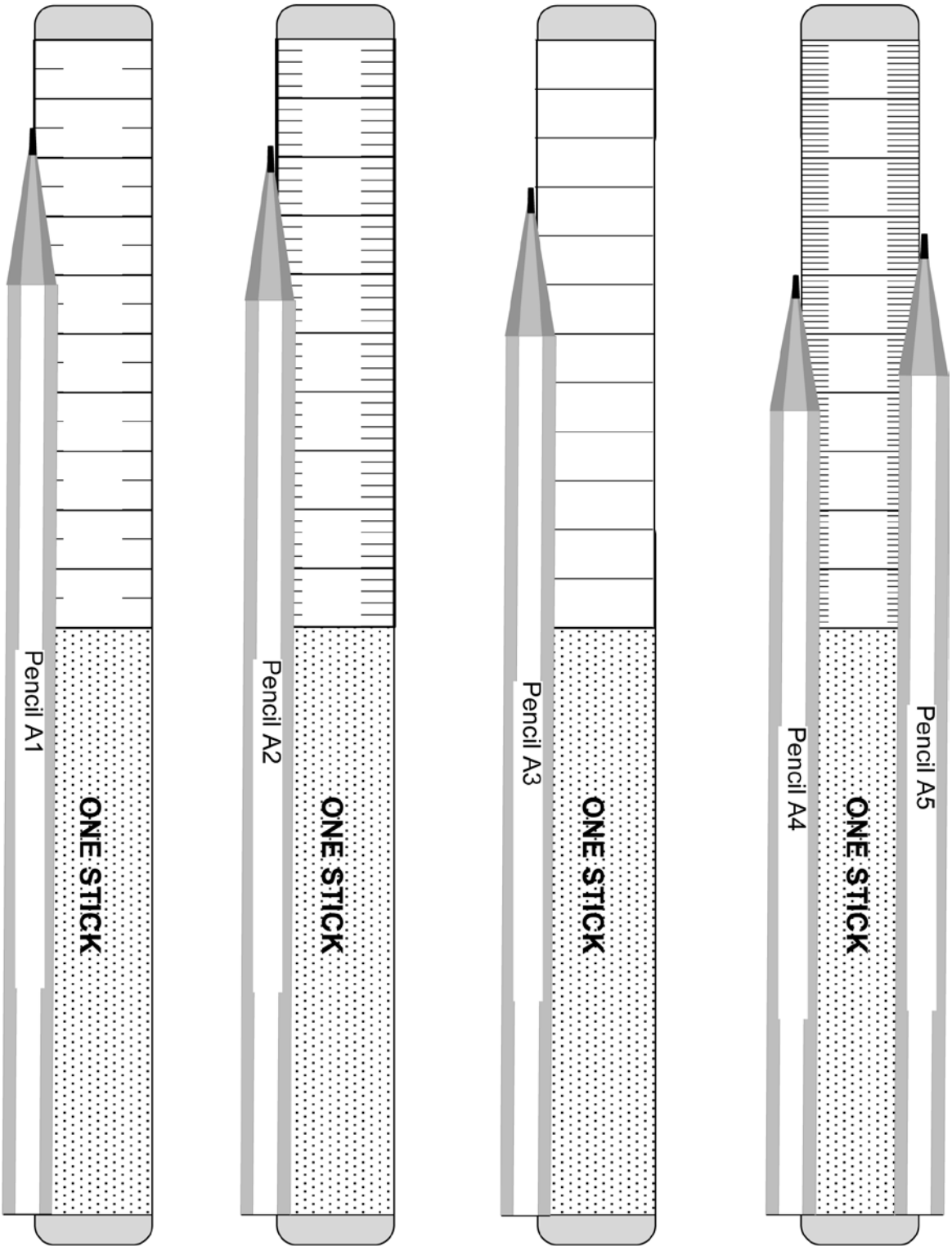
Annexure Q (Fractionrulers)

Pencil sheet E



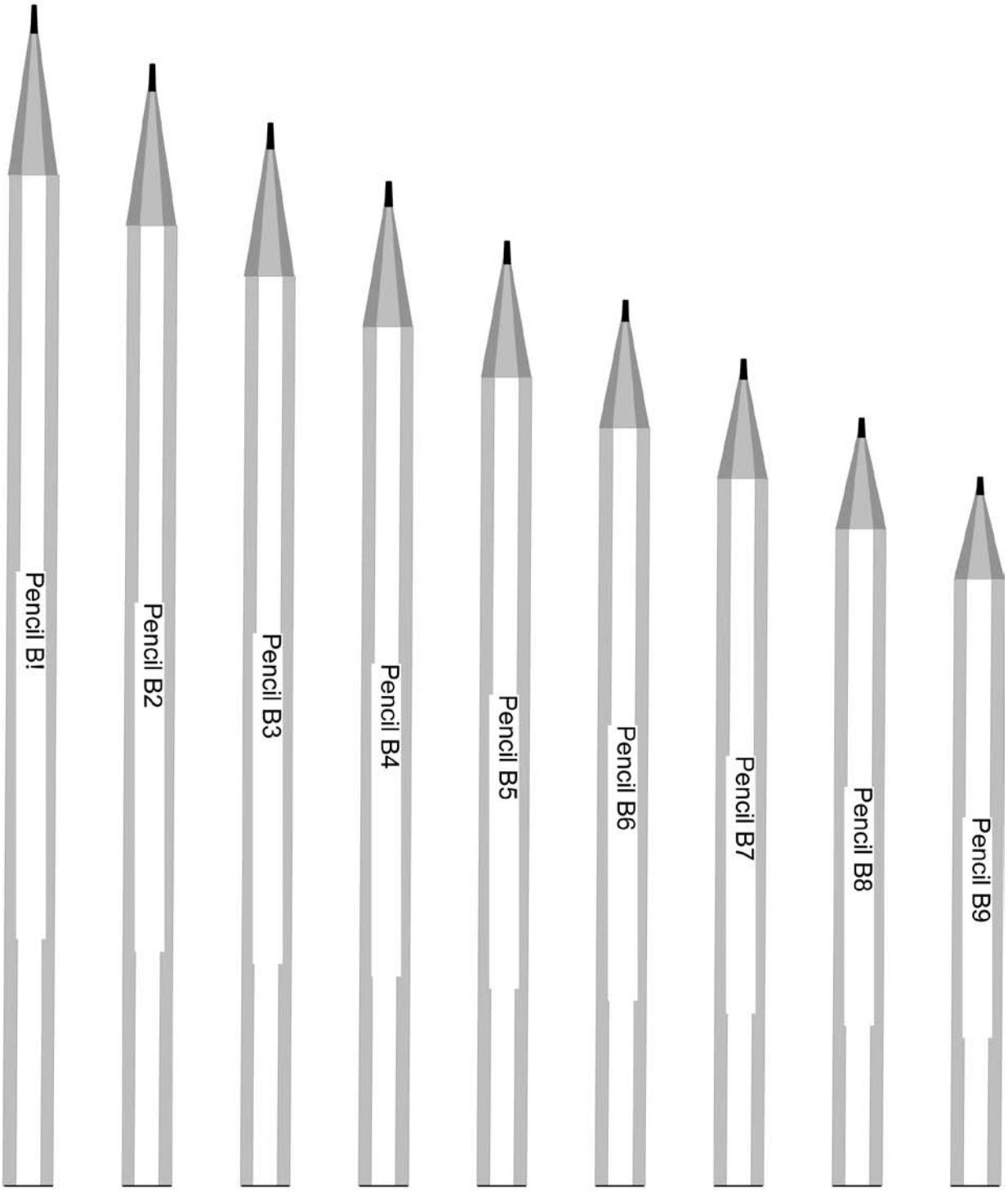
Annexure Q (Fractionrulers)

Pencil sheet F



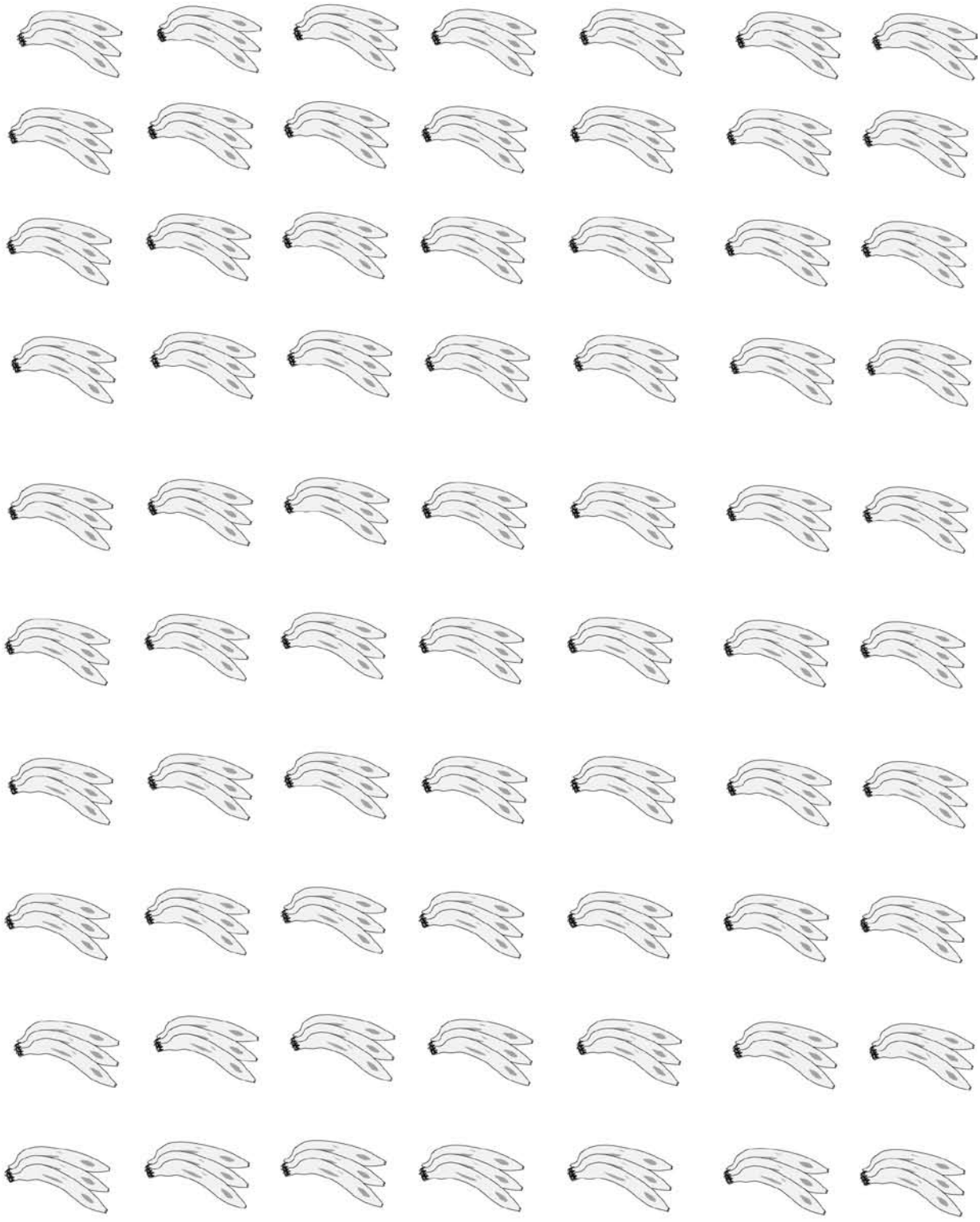
Annexure Q (Fractionrulers)

Pencil sheet G



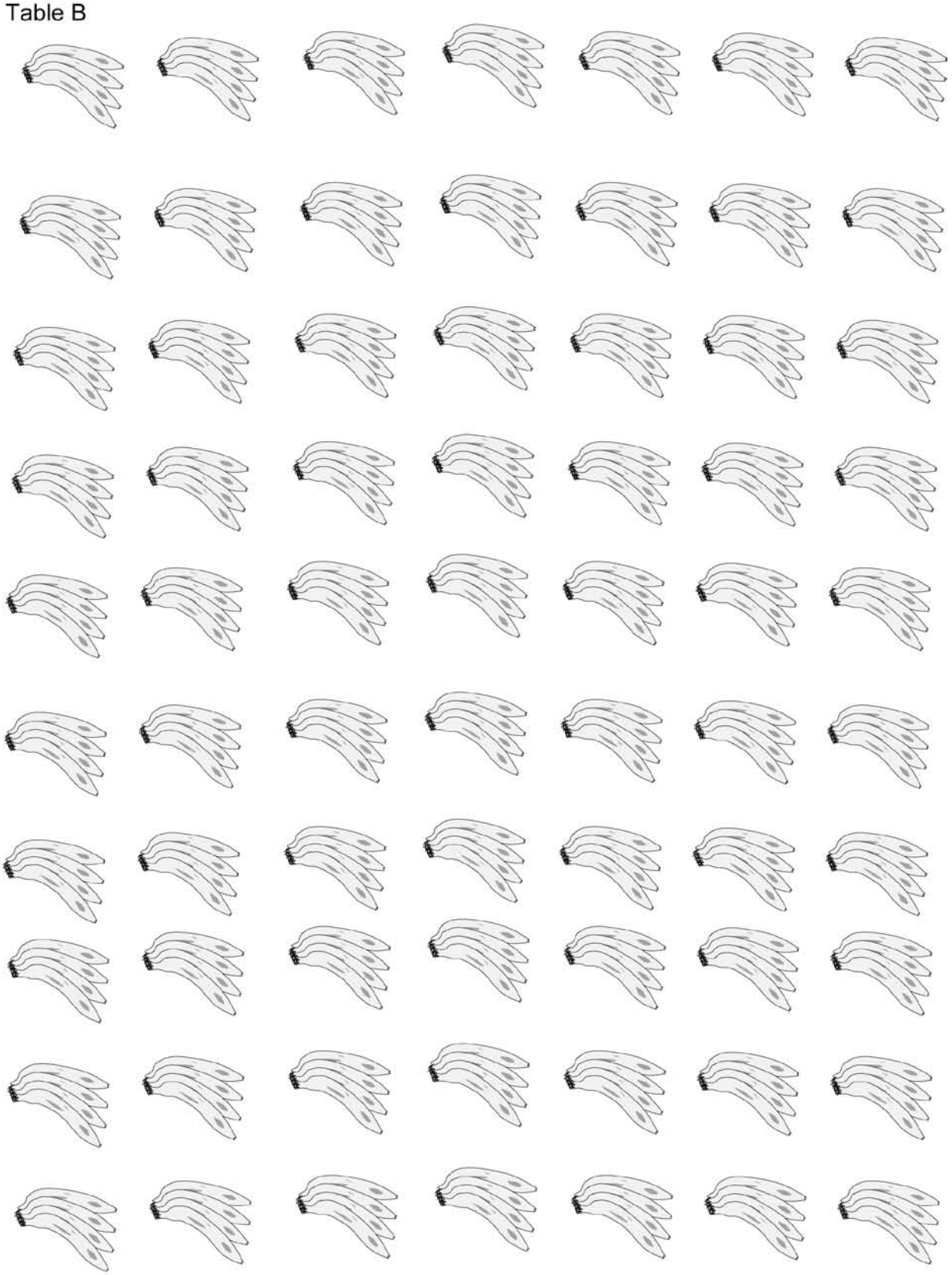
Annexure Q (Fractionrulers)

Table A



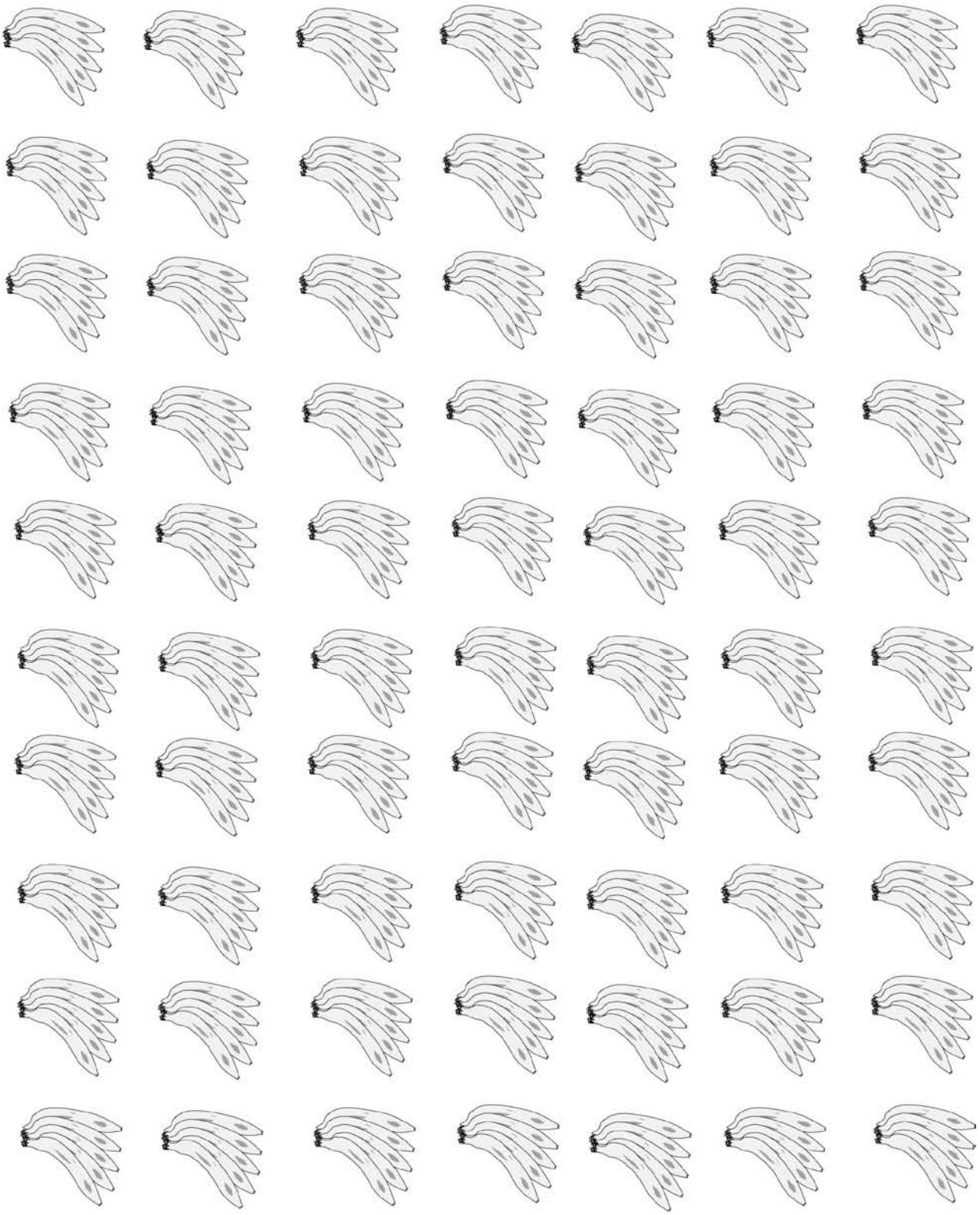
Annexure R (Bunches of bananas)

Table B



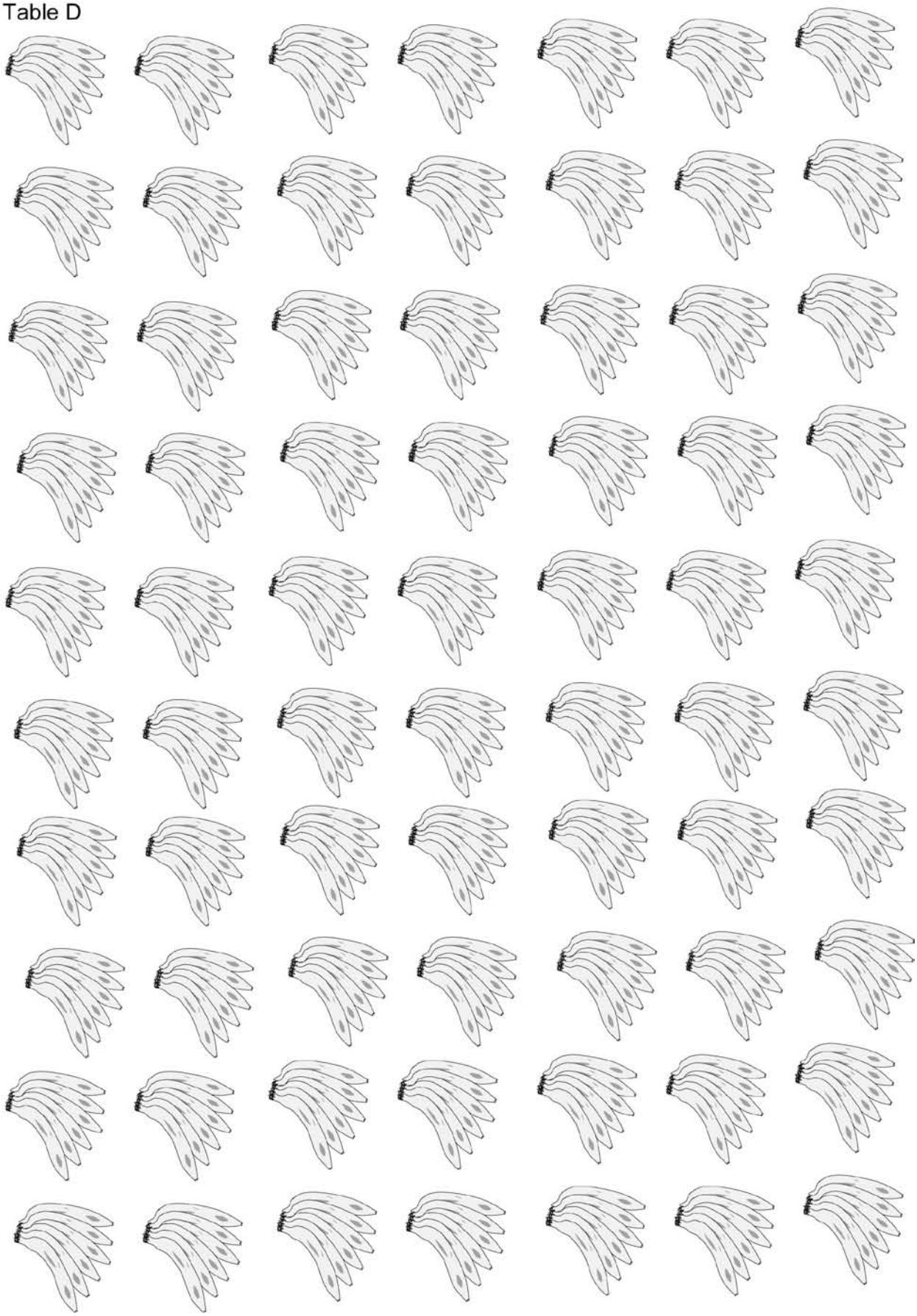
Annexure R (Bunches of bananas)

Table C



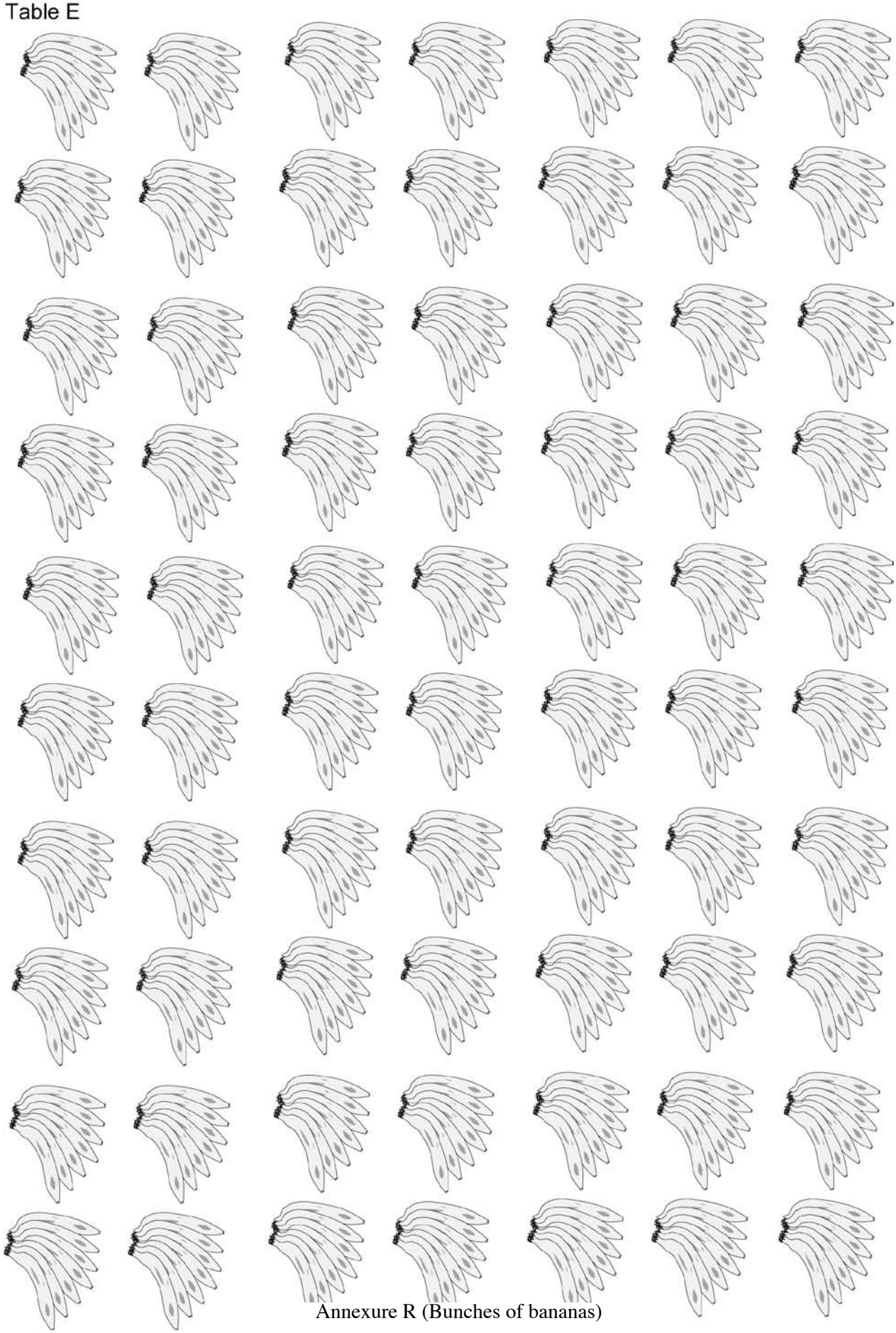
Annexure R (Bunches of bananas)

Table D



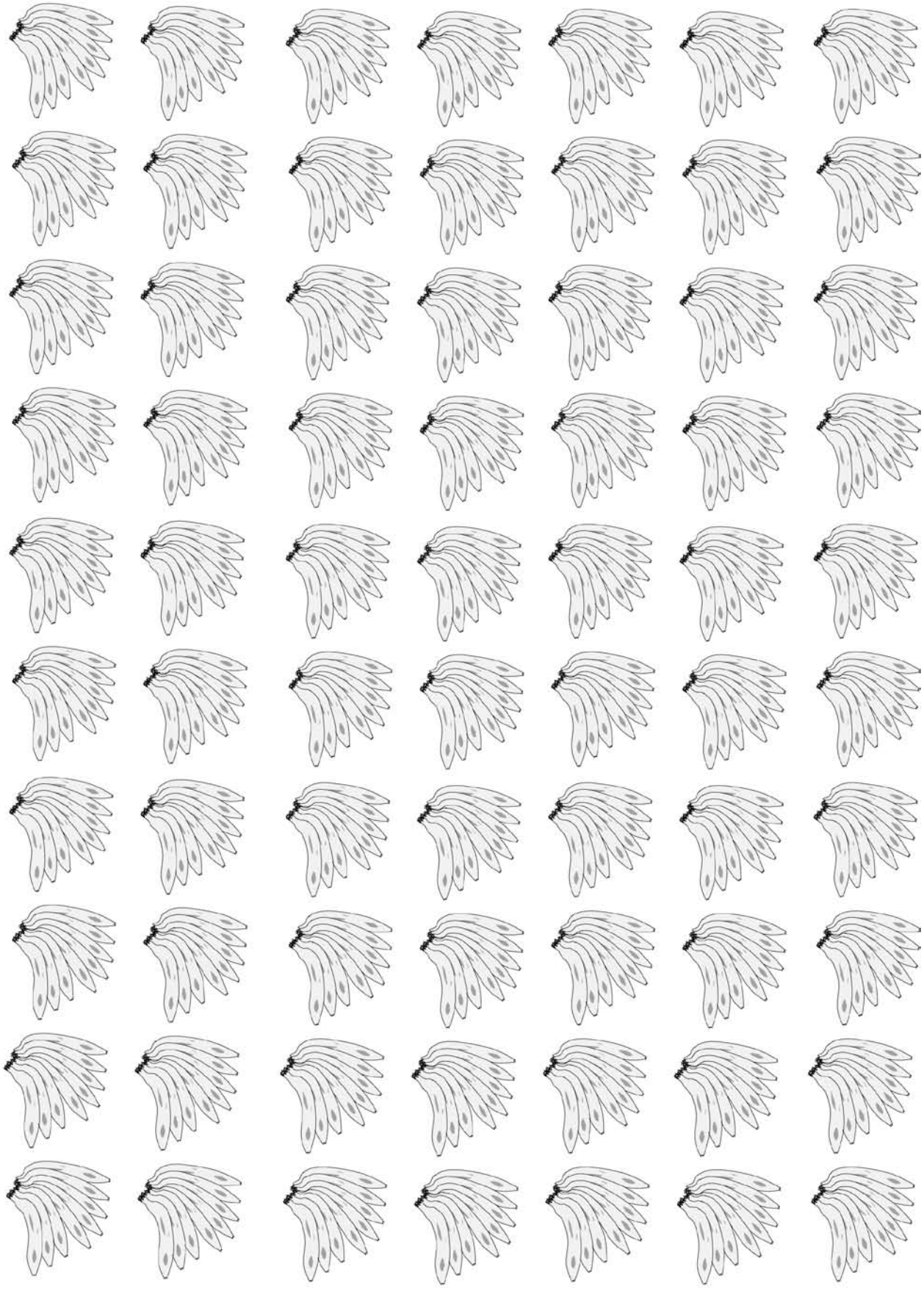
Annexure R (Bunches of bananas)

Table E



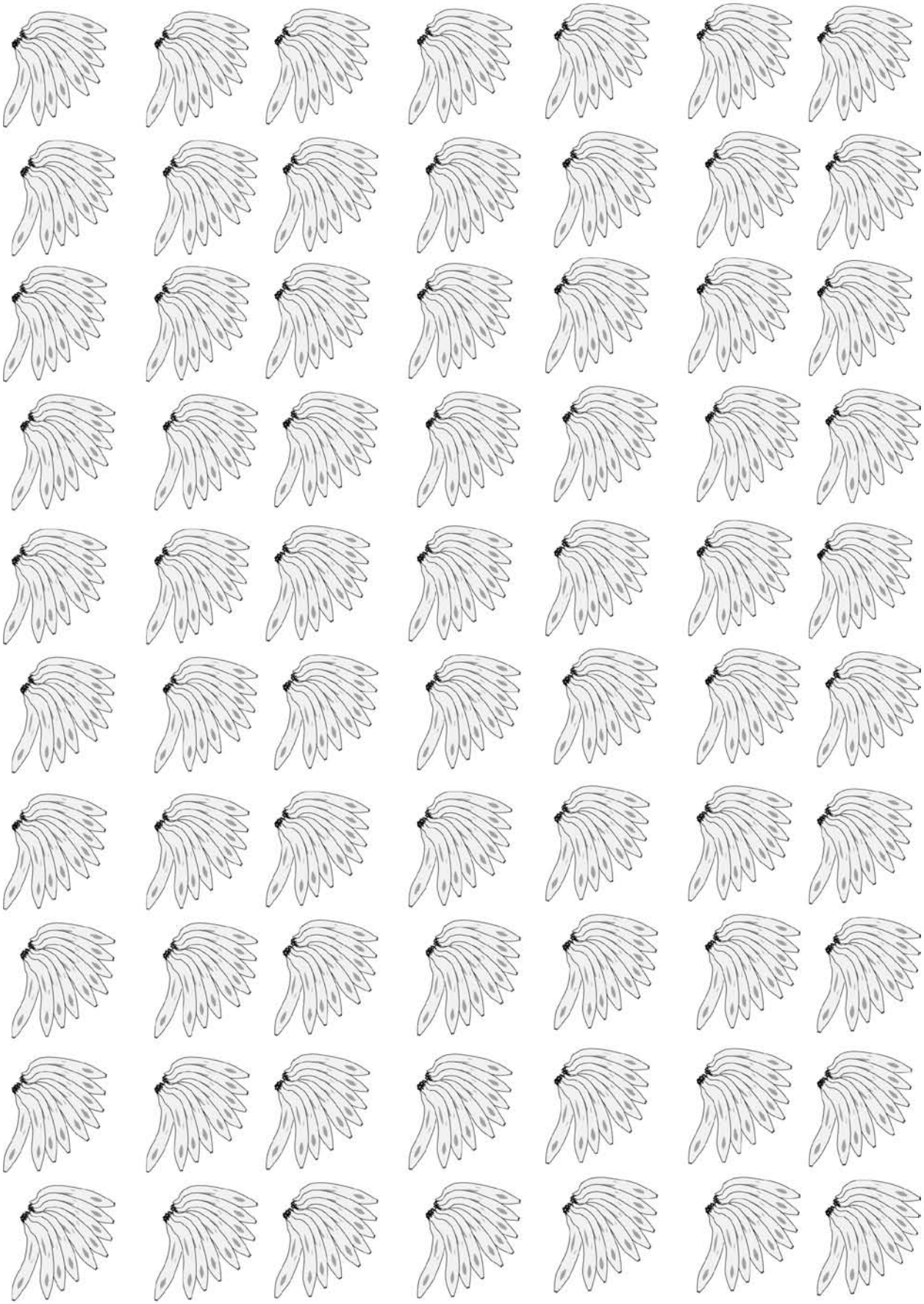
Annexure R (Bunches of bananas)

Table F



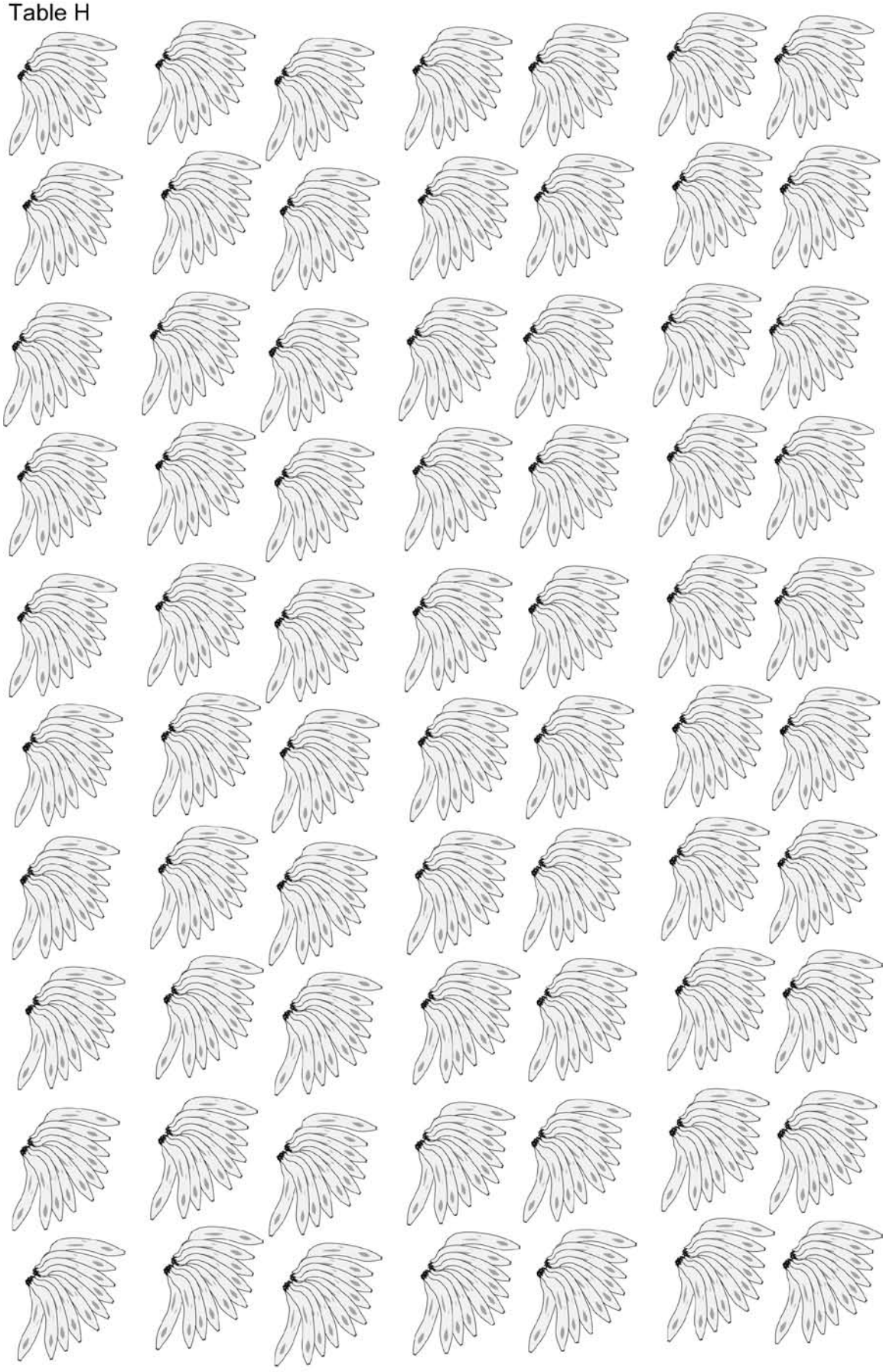
Annexure R (Bunches of bananas)

Table G



Annexure R (Bunches of bananas)

Table H



Annexure R (Bunches of bananas)

Multiplication worksheet 1

1. Trevor takes 7 bunches from Table A. How many bananas does he take?
2. Trevor takes 7 bunches from Table H. How many bananas does he take?
3. Trevor takes 7 bunches from Table B. How many bananas does he take?
4. Trevor takes 7 bunches from Table G. How many bananas does he take?
5. Trevor takes 7 bunches from Table C. How many bananas does he take?
6. Trevor takes 7 bunches from Table F. How many bananas does he take?
7. Trevor takes 7 bunches from Table D. How many bananas does he take?
8. Trevor takes 7 bunches from Table E. How many bananas does he take?
9. Mpho takes 4 bunches from Table A. How many bananas does she take?
10. Mpho takes 4 bunches from Table H. How many bananas does she take?
11. Mpho takes 4 bunches from Table B. How many bananas does she take?
12. Mpho takes 4 bunches from Table G. How many bananas does she take?
13. Mpho takes 4 bunches from Table C. How many bananas does she take?
14. Mpho takes 4 bunches from Table F. How many bananas does she take?
15. Mpho takes 4 bunches from Table D. How many bananas does she take?
16. Mpho takes 4 bunches from Table E. How many bananas does she take?
17. Tom takes 5 bunches from Table E. How many bananas does he take?
18. Mary takes 9 bunches from Table A. How many bananas does she take?
19. Tom takes 6 bunches from Table B. How many bananas does he take?
20. Mary takes 8 bunches from Table H. How many bananas does she take?
21. Tom takes 4 bunches from Table F. How many bananas does he take?
22. Mary takes 3 bunches from Table G. How many bananas does she take?
23. Tom takes 10 bunches from Table C. How many bananas does he take?
24. Mary takes 9 bunches from Table D. How many bananas does she take?

Annexure S (Multiplication facts)

Multiplication worksheet 2

1. Temba buys 6 bunches of bananas, with 8 bananas in each bunch.
   How many bananas is that altogether?

2. Natalie buys 8 bunches of bananas, with 7 bananas in each bunch.
   How many bananas is that altogether?

3. Jonas buys 9 bunches of bananas, with 9 bananas in each bunch.
   How many bananas is that altogether?

4. Gertrude buys 4 bunches of bananas, with 7 bananas in each bunch.
   How many bananas is that altogether?

5. Tabo buys 5 bunches of bananas, with 5 bananas in each bunch.
   How many bananas is that altogether?

6. Manare buys 9 bunches of bananas, with 10 bananas in each bunch.
   How many bananas is that altogether?

7. Lebogang buys 3 bunches of bananas, with 4 bananas in each bunch.
   How many bananas is that altogether?

8. Aubrey buys 7 bunches of bananas, with 6 bananas in each bunch.
   How many bananas is that altogether?

9. Temba buys 8 bunches of bananas, with 6 bananas in each bunch.
   How many bananas is that altogether?

10. Natalie buys 6 bunches of bananas, with 8 bananas in each bunch.
    How many bananas is that altogether?

11. Jonas buys 7 bunches of bananas, with 7 bananas in each bunch.
    How many bananas is that altogether?

12. Gertrude buys 7 bunches of bananas, with 8 bananas in each bunch.
    How many bananas is that altogether?

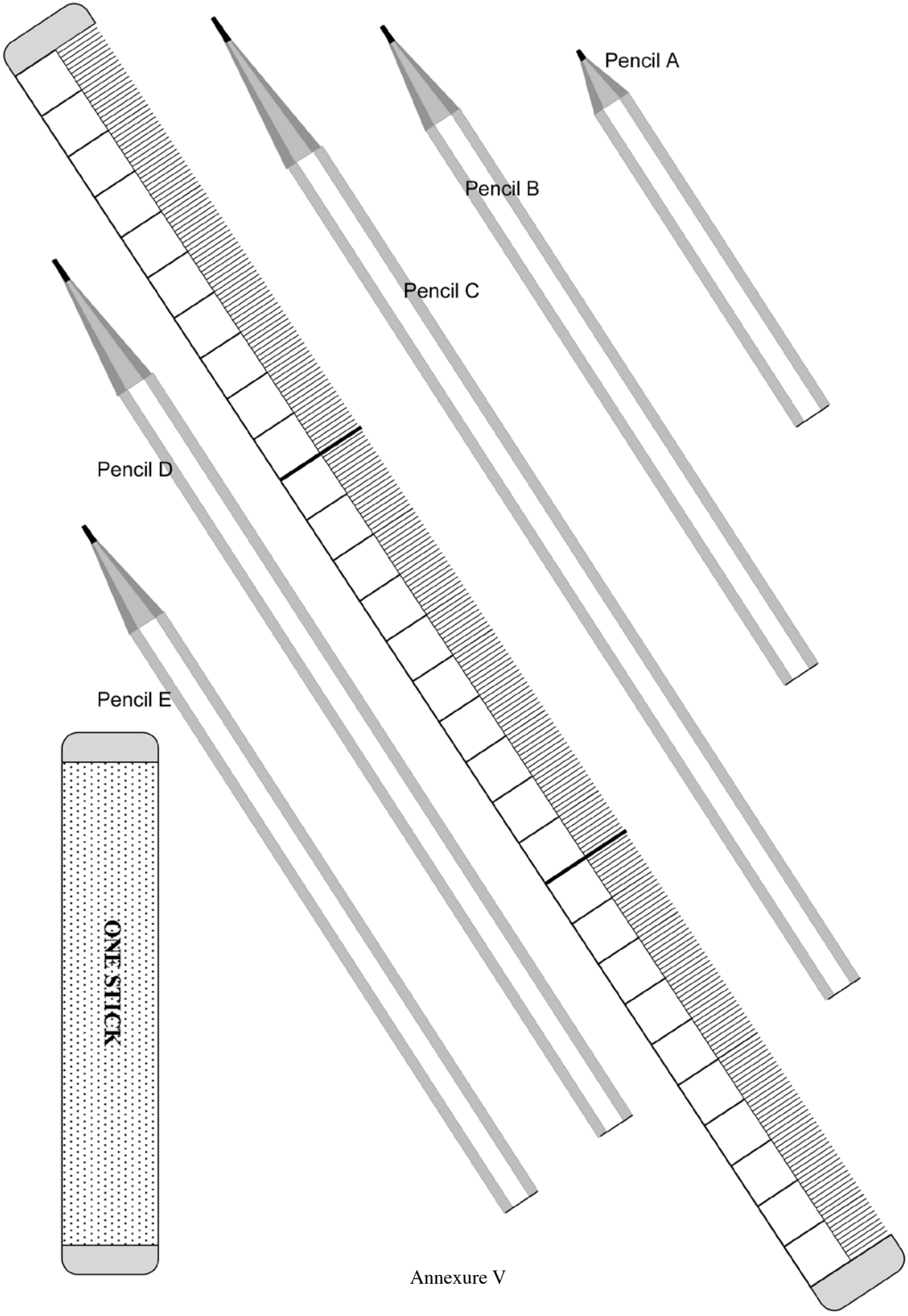
13. Tabo buys 8 bunches of bananas, with 8 bananas in each bunch.
    How many bananas is that altogether?

Annexure S (Multiplication facts)

Multiplication worksheet 3

1. 20 bunches of bananas are delivered to a shop. There are 7 bananas in each bunch. How many bananas is this in total?
2. 50 bunches of bananas are delivered to a shop. There are 8 bananas in each bunch. How many bananas is this in total?
3. 30 bunches of bananas are delivered to a shop. There are 9 bananas in each bunch. How many bananas is this in total?
4. 40 bunches of bananas are delivered to a shop. There are 6 bananas in each bunch. How many bananas is this in total?
5. 90 bunches of bananas are delivered to a shop. There are 4 bananas in each bunch. How many bananas is this in total?
6. 60 bunches of bananas are delivered to a shop. There are 6 bananas in each bunch. How many bananas is this in total?
7. 70 bunches of bananas are delivered to a shop. There are 9 bananas in each bunch. How many bananas is this in total?
8. 80 bunches of bananas are delivered to a shop. There are 3 bananas in each bunch. How many bananas is this in total?
9. 30 bunches of bananas are delivered to a shop. There are 7 bananas in each bunch. How many bananas is this in total?
10. 50 bunches of bananas are delivered to a shop. There are 8 bananas in each bunch. How many bananas is this in total?
11. 40 bunches of bananas are delivered to a shop. There are 6 bananas in each bunch. How many bananas is this in total?
12. 70 bunches of bananas are delivered to a shop. There are 8 bananas in each bunch. How many bananas is this in total?

Annexure S (Multiplication facts)



Annexure V

Notes: