Foundations For Learning

Intermediate Phase
Mathematics
Lesson plans

Second term

Grade 4

Kindly send any response that you may have to:
Dr Jennifer J Joshua
E-mail: joshua.j@doe.gov.za

Department of Education
Sol Plaatje House
123 Schoeman Street
Pretoria
South Africa

Private Bag X895
Pretoria
0001

Tel: +27 12 312 6220
Fax: +27 12 321 6222
www.education.gov.za

© Department of Education
Design and layout: Shereno (012) 344 2817

Contents

Second Term 5
Overview of Lesson Plans 5
Overview of Assessment Tasks 6
Lesson plans:..... 9
Week 1: Overview..... 9
Week 1: Lesson plans 10
Week 2: Overview..... 19
Week 2: Lesson plans 20
Week 3: Overview..... 33
Week 3: Lesson plans 34
Week 4: Overview..... 41
Week 4: Lesson plans 42
Week 5: Overview..... 51
Week 5: Lesson plans 52
Week 6: Overview..... 59
Week 6: Lesson plans 60
Week 7: Overview..... 69
Week 7: Lesson plans 70
Week 8: Overview..... 85
Week 8: Lesson plans 86
Week 9: Overview..... 99
Week 9: Lesson plans 100
Week 10: Overview..... 105
Week 10: Lesson plans……....106

SECOND 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 in different intervals					Counting		Counting in intervals (patterns)		
	Addition and subtraction of single digit numbers									
	Addition and subtraction of multiples of 10 and 100									Addition and subtraction of multiples of 10 and 100
	Multiplication facts				Multiplication facts				Multiplication facts	
	Varied mental calculations.						Varied mental calculations			

	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 in expanded notation	Compare and order numbers								Fractions in the context of measurement
		Problems that involve addition and subtraction			Problems that involve multiplication, grouping and sharing					Problems that involve multiplication, grouping and sharing
					The concept of rate					
	Extend number patterns		Extend geometric and number patterns					Make and extend number patterns		
		Investigate 3-dimensional shapes							Make and investigate 2-D and 3-D shapes	
							Mass and measuring mass			
						Predictions about uncertain events				

SECOND 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	• Writing numbers, by showing it with Flard cards and by writing it in expanded notation	**Day 1, Activity 2:** Writing numbers in expanded notation.
Week 2	• In the range up to 2 000: - Say which of two given numbers is bigger. • Orders more than two given numbers from smaller to bigger	**Day 1, Activity 2:** Ordering numbers
Week 3	• Solving problems by using addition and subtraction.	**Day 4, Activity 1**: Problem solving, addition and subtraction skills.
Week 4	• Investigates and compares three-dimensional objects	**Day 1:** Imprints of faces of 3-d shapes. **Day 4:** Formal assessment on shapes.
Week 5	• Solving problems by using addition, subtraction and multiplication	**Day 4, Activity 3:** Problem solving, multiplication skills.
Week 6	• Compares and classifies events from daily life as: - certain that they will happen; or - certain that they will not happen; or - uncertain. • Counts the number of possible outcomes for simple trials	Informal assessment throughout week
Week 7	• Uses the appropriate SI unit to estimate, measure, record and compare mass (grams and kilograms).	**Days 1 to 4:** informal assessment. Guidelines are given in the daily lesson plans. **Day 5:** Formal assessment on measuring mass.

Week 8	• Solve problems involving selecting, calculating with and converting between appropriate SI units: - Grams ↔ kilograms • Use appropriate measuring instruments to appropriate levels of precision including: • bathroom scale, kitchen scale and balances to measure mass Investigate and extend numeric (to at least 2 000) and geometric patterns looking for general rules or a relationship	**Day 2:** Formal assessment on mass and measurement. **Day 5:** Formal assessment, number patterns.
Week 9	• In the range up to 2 000: - Say which of two given numbers is bigger. • Orders more than two given numbers from smaller to bigger	**Day 1, Activity 3**: Number concept, 4-digit numbers up to 2000.
Week 10	• Solving problems by using addition, subtraction and multiplication • Solves problems involving equal sharing and measurement, involving fractions including halves, thirds, quarters, fifths, sixths, sevenths, eighths, ninths and tenths	**Day 2:** Problem solving and computation **Day 3:** Informal assessment, fraction concept.

SECOND TERM: WEEK 1 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 1 AS 4 and 9	**Milestones:** • Counting in a variety of intervals • Counting given structured collections of objects (pictures and marks) up to 2000, recording the result by writing the number name in words, by showing it with flard cards and by writing it in expanded notation • 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 2 000, e.g. 20 × 30 • 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- and four-digit numbers up to at least 2 000

A major focus of this first week's work is to provide learners with opportunities to advance their number concept beyond 1000, and to practice mental addition and multiplication.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Write 3-digit numbers in expanded notation	Count in ones, tens, hundreds and thousands	Mental multiplication	Mental addition. Number patterns.	Mental addition. Number patterns.
Resources	Scissors Annexure I Annexure B	Annexure C	Annexure K Term 1 Annexure R. (Multiplication fact cards). Scissors.	Annexure A.	

The lesson plans for this week may be implemented in any order.
Note that many pairs of scissors will be needed for the lesson plans for Day 1 and Day 3.

You need to print and cut a set of number cards (Annexure E) sometime this week, because you will need the set of cards on Day 1 of Week 2.

WEEK 1: DAY 1

Notes to the teacher:

- Learners cut additional flard cards (3000 to 10 000) and multiplication bond cards.
- Learners do a written baseline (diagnostic) assessment on number concept.

Resources:

- A copy of Annexure B (1000 to 2000 number cards) for each learner, preferably printed on heavy and coloured paper.
- A suitable container (large envelope or small box) for 120 small cards for each learner.
- A copy of Annexure I (Many 3-digit numbers), cut into strips with 5 numbers on each strip, one strip for each learner.
- A n A4 sheet for each learner
- The sets of flard cards that learners used in term 1.
- A pair of scissors for each learner.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1:

Hand out one copy (10 sheets) of 4-digit numbers from Annexure B to each learner. They have to cut the number cards out and store them in a suitable container (envelope or small box).

These cards will be used in Week 2.

Activity 2 (Assessment):

Hand out the strips with 3-digit numbers (5 numbers on each strip), that you have cut from Annexure I. Different learners should get different sets of numbers. Learners should write their names at the top of the sheets.

Ask learners to do the following for each number:

- make a drawing to show how they will represent the number with flard cards;
- write the number in expanded notation;
- write the number in words.

Learner may use their flard cards to figure out how to represent the numbers.

At the bottom of the sheet, they have to write the five numbers, from smallest to largest.

Take the sheets in for assessment when learners have finished, so that you can analyse their answers to help you prepare for the teaching challenges you face this term.

WEEK 1: DAY 2

Notes to the teacher:

- Learners will count collections of more than 1000 objects and work at some straightforward problems. Note that they already have flard cards for 1000 and 2000 in the sets that they have cut in Term 1.

Resources:

- One copy of Annexure C (Apple counting sheets) for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1:

Hand out copies of Annexure C (6 sheets A to F) 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 and in words in his/her classwork book.

Circulate between the desks. If you observe learners who count the apples in ones, or even in tens (on other sheets than B), interact with these learners with a view to help them realise that they may count in hundreds.

The correct answers are as follows:

Sheet A: 1000 one thousand

Sheet B: 800 + 60 eight hundred and sixty

Sheet C: 1000 + 30 + 5 one thousand and thirty-five

Sheet D: 1000 + 500 one thousand five hundred

Sheet E: 1000 + 100 + 50 + 8 one thousand one hundred and fifty-eight

Sheet F: 1000 + 200 + 40 + 2 one thousand two hundred and forty-two

(Write the questions for Activity 2 on the board while learners count the apples.)

Learners may not know how to write the answers in words. Ask them to do their best, and when all learners have finished counting the apples on sheets A to F, write the answers on the board.

Activity 2:

Write this on the board:

Write your answers in expanded notation.

1. How many apples are shown on sheets A and B together?
2. How many apples are shown on sheets B and C together?
3. How many apples are needed to fill sheet B up to 1000 apples?
4. How many apples are needed to fill sheet F up to 1500 apples?
5. Now write your answers in condensed notation.

Write the questions for Activity 3 on the board while learners work on Activity 2.

Activity 3:

Write this on the board:

Write the next ten numbers in each of the following number patterns, in words:

Pattern A: 984 987 990 993

Pattern B: 945 955 965 975

Pattern C: 790 840 890 940

Pattern D: 825 850 875 900 925

Pattern E: 450 650 850

Pattern F: 991 993 995 997 999

Pattern G: 990 992 994 996 998

Pattern F: 680 700 740 800 880

Pattern G: 990 991 994 999

CONSOLIDATION

Let learners stop working 10 minutes before the end of the period. Arrange them in groups of three or four and let them compare and discuss their answers. Circulate between the groups, and engage with learners about how the numbers may be written in words, if necessary.

WEEK 1: DAY 3

Notes to the teacher:

- Learners will cut multiplication fact cards.
- Each learner will do a self-assessment of his/her knowledge of multiplication facts and ability to quickly find multiplication facts.

Resources:

- A copy of Annexure K (multiplication fact cards) for each learner.
- A pair of scissors for each learner.
- Three envelopes for each learner.
- A copy of the Term 1 Resource R (sheets with bunches of bananas) for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1:

Hand out scissors and copies of Annexure K to each learner.

They have to cut out the cards.

While they cut, you may hand out a copy of Term 1 Resource R to each learner.

Activity 2:

Each learner now has to sort his/her cards into three piles:

A. Those for which the learner believes he/she knows the correct answer straightaway.
B. Those for which the learner believes he/she knows a way to quickly find the correct answer, e.g. by counting or in some other way.
C. Those for which the learner does not know the answer, nor know of a quick way to find the answer.

Each pile of cards should be put into a separate envelope, labeled A, B or C.

Activity 3:

Each learner should now work through his/her B-cards, find the answer in some way or another (e.g. by counting) and write the answers in their classwork books. The answers should be checked by counting in 3s, 4s, 5s, 6s, 7s, 8s or 9s, whatever the case may be. This can be done in conjunction with pointing to banana bunches on the resource R sheets. The purpose of having the students refer to these sheets is to ensure that they keep the actual meaning of multiplication in mind and do not just try to memorise facts.

Each learner should then look at all his/her B-cards again. For some of them, he/she may now know the answer straightaway. These cards may be transferred to the A-envelope.

Activity 4:

Each learner should now work with his/her C-cards and try to find a way to work out the answer. Allow learners to consult one another. You may suggest techniques like the following:

- Break the question down into parts for which the answers are known. For example: 7×60 may be broken down into 2×60 + 2×60 + 2×60 + 60, which is 360 + 60 = 420.
- Double one of the numbers repeatedly, writing down the results, to produce a table that may be helpful. For the card 30×60 for instance, the following may be produced:

1	2	4	8	16	32	64					
30	60	120	240	480	960	1920					

- Make and write down a sequence (number pattern) starting at one of the two numbers on the card, then add the other number on the card repeatedly, and keep track of the number of terms, until the answer is found. For the card 30×50 for instance, the learner may write down the following sequence to establish that 30×50 = 1500:

1	2	3	4	5	6	7	8	9	10
50	100	150	200	250	300	350	400	450	500
11	12	13	14	15	16	17	18	19	20
550	600	650	700	750	800	850	900	950	1000
21	22	23	24	25	26	27	28	29	30
1050	1100	1150	1200	1250	1300	1350	1400	1450	1500

Learners may decide to transfer some of their C-cards to the B-envelope.

CONSOLIDATION

Activity 5:

Finally, each learner must write the answers for his/her A-cards in his/her classwork book. Then the learner should use the banana bunch sheets (Resource R) to check the answers. If some answers are wrong, those cards must be put into the B-envelope.

Learners who do not finish in class, should take the work home for completion.

Learners who finish quickly may try to find the 25th term of the number sequence below:
The sequence is formed by alternatively adding 30 and subtracting 20:

1	2	3	4	5	6	7	8	9	10
1010	1040	1020	1050	1030	1060	1040	1070	1050	1080

WEEK 1: DAY 4

Notes to the teacher:

- Learners should sometimes be challenged to read and make sense of instructions, and this lesson provides for that. Tell learners that one purpose of the lesson is for them to develop their reading skills and allow them some time to read for themselves. In the end you may have to help some learners who do not comprehend the descriptions of the number patterns, but do not resort to that too easily. Learners do need to be pressured a bit to read, otherwise they will never learn to read.
- Learners will extend number patterns. These patterns are designed to help learners strengthen their sense of numbers beyond 1000.

Resources:

- A copy of Annexure A (Number journeys 1).for each learner: one copy of journeys A and B, and 4 copies of journey X.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1:

Hand out copies of the three sheets Number journeys A, B and X. Learners have to complete these journeys A and B individually. Circulate between learners and provide support where necessary so that they understand what the task is, for number journeys A and B.

Activity 3

As soon as you see that some learners near completion of journey B, write the following instructions on the board.

The first journey X is exactly like journey A, except that you start at 400 and not at 300.

Hand out two more copies of the "blank" journey X to each learner, and write the following instructions on the board:

The second journey X is exactly like journey B, except that you add 60 each time.

For the third journey X, you start at 250 and add 90 each time.

Activity 3:

Write the following specifications for number patterns on the board, up to pattern K. Learners have to write down the first ten numbers of each sequence. You may do the first two on the board as demonstrations if needed. Learners should start working while you are writing.

Pattern A: The first number is 974. To form the pattern, you add 8 each time.

Pattern B: The first number is 1000. To form the pattern, you subtract 25 each time.

Pattern C: The first number is 984. To form the pattern, you add 7 each time.

Pattern D: The first number is 930. To form the pattern, you add 10 each time.

Pattern E: The first number is 200. To form the pattern, you add 100 each time.

Pattern F: The first number is 1 and the second number is 1. The third number is 2. To go further, you add the previous two numbers each time.

WEEK 1: DAY 5

Notes to the teacher:

- In Activity 1, learners get acquainted with a new form of activity, namely to make predictions about sequences (patterns) without actually extending the sequences. They then check their predictions by extending the sequences.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1:

Write this on the board:

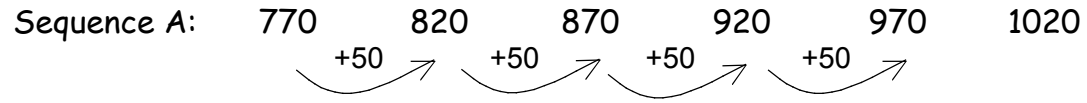
	First number	Second number	Third number	Fourth number	Fifth number	Sixth number
Sequence A	770	820	870	920	970	1020
Sequence B	330	430	530	630	730	830

Ask learners the following questions:

Which sequence (pattern) has bigger numbers than the other?

Which sequence will have bigger numbers when they reach the tenth number?

Learners have to form an expectation without actually extending the sequences. For learners who find this difficult, you may suggest that they write the sequences down and calculate the differences between the terms, for example:



You may also suggest that they calculate the differences between the numbers of the two sequences, to help them to make a prediction:

	1st	2nd	3rd	4th	5th	6th
Sequence A:	770	820	870	920	970	1020
Sequence B:	330	430	530	630	730	830
Sequence B – Sequence A:	440	390	340	...	...	...

Once learners have made their predictions about which sequence will be the biggest by the tenth number, they should form groups of three or four and tell each other what they predict. Learners should then, individually, extend the sequences up to the twelfth term and check which prediction was correct.

Activity 2:

Write this on the board:

	First number	Second number	Third number	Fourth number	Fifth number	Sixth number
Sequence C	940	980	1020	1060	1100	1140
Sequence D	930	960	990	1020	1050	1080
Sequence E	740	800	860	920	980	1040

Ask learners the following question:

Which sequence will have bigger numbers when they reach the twelfth number?

Once learners have made their predictions about which sequence will be the biggest by the twelfth number, they should form groups of three or fours and tell each other what they predict. Learners should then, individually, extend the sequences up to the fifteenth term and check which prediction was correct.

While learners work, you may write more questions like these on the board and learners and groups may progress from one question to the next. For all these questions, learners should predict which sequence will be biggest by the **twelfth** number.

	First number	Second number	Third number	Fourth number	Fifth number	Sixth number
Sequence F	840	880	920	960	1000	1040
Sequence G	950	980	1010	1040	1070	1100
Sequence H	620	680	740	800	860	920

	First number	Second number	Third number	Fourth number	Fifth number	Sixth number
Sequence I	1005	1030	1055	1080	1105	1130
Sequence J	870	900	930	960	990	1020
Sequence K	240	330	420	510	600	690

	First number	Second number	Third number	Fourth number	Fifth number	Sixth number
Sequence L	510	620	730	840	950	1060
Sequence M	480	600	720	840	960	1080
Sequence N	450	580	710	840	970	1100

Learners who finish while there is still time left, may tackle this challenge, which is much more demanding: Make three number patterns with different first numbers, but equal tenth numbers.

SECOND TERM: WEEK 2 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 4 AS 1, 3, 4, 6, 8 and 9.	**Milestones:** • Say which of two given numbers is bigger. • Orders more than two given numbers from smaller to bigger • Counting in a variety of intervals • Counting given structured collections of objects (pictures and marks) up to 2000, recording the result by writing the number name in words, by showing it with Flard cards and by writing it in expanded notation • Solve problems that involve addition and subtraction.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Comparing and ordering 3-digit numbers, working individually with cards, and playing a game.	Counting in different intervals, counted grouped collections of objects.	Working at problems that involve addition and subtraction.	Working at problems that involve addition and subtraction. Comparing and ordering 4-digit numbers, playing a game.	The whole lesson is devoted to mental computation, addition, subtraction and multiplication.
Resources	Annexure D (Number cards). Scissors. Plastic bags.	Term 1 Annexure K Annexure F (Banknotes) Annexure H (Number bond cards). Scissors.	Term 1 Annexure O (The set of fake banknotes). The set of flard cards for each learner.	Annexure B.	Annexure H. Annexure K.

The lessons for Week 2 days 1 and 2 can be interchanged with any other lesson during the week, to make the available pairs of scissors go round each class.

WEEK 2: DAY 1

Notes to the teacher:

- By packing number cards from smallest to biggest while playing the "Number Placing game", learners will compare numbers and arrange numbers from smallest to largest.

Resources:

- A copy of Annexure D (Number cards 100 to 1003) for each learner, preferably printed on heavy and coloured paper.
- For each learner a suitable container, for example an envelope, for the number cards 100 to 1003. Learners may make envelopes from sheets of paper (see Term 1, Week 1, Day 1) or from the template given in Term 1, Resource C.
- A pair of scissors for each learner.
- A plastic bag (like a shopping bag) for every four learners in the class.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1:

Hand out a pair of scissors and a copy of Annexure D to each learner. Learners have to cut out the number cards on the thick lines, preferably on the middle of the lines so that each card has a line on its edge. Learners who have finished should continue with Activity 2 straightaway.

Activity 2:

Each learner should pack out his/her number cards from smallest to biggest, for example as shown on the next page. Some learners may put the bigger cards at the top or to the left. That is fine. The activity will provide learners with an opportunity to associate the size of numbers with positions on some spatial image. While learners have to gradually learn to associate the size of numbers with positions on a number line, they should also have freedom to develop other spatial arrangements of numbers.

Circulate between learners to check whether they get this right.

Assign learners who have finished Activity 2 with success to groups of no more than three learners per group, to do Activity 3.

Grade 4 learners who do not manage to get Activity 2 right at this stage need some special help with respect to their understanding of 3-digit numbers. Instead of playing the game (Activity 3), you may give them copies of Term 1 Resources E, F and H (apple counting sheets) and ask them to count the apples on each sheet and to represent the number in words, with flard cards, in expanded notation and in condensed notation. Doing this may provide them with opportunities to develop a better understanding of 3-digit numbers.

106 118 122 138 145 153 162 174 187 194

202 213 220 236 249 254 269 277 289 299

300 314 320 333 344 358 368 377 386 396

406 416 427 437 443 453 465 478 480 499

508 517 528 535 548 551 567 579 589 591

601 615 623 638 648 653 663 672 682 698

708 717 723 733 749 758 764 774 784 795

801 816 821 832 845 851 868 872 882 897

904 917 926 930 945 950 968 976 986 998

1000 1001 1002 1003

ORAL AND MENTAL ACTIVITIES

Activity 3 (The Number Placing game):

This is a game played by three (or four) learners with one stack of the number cards (100 to 1000) that learners have cut. The cards are put in a plastic bag. One card is drawn and placed face up in the middle of the desk around which the players sit. Each learner then draws 10 cards from the bag. Another card from the pack is placed face up on the desk, for example:

427

The learner with the smallest card (number) has the first turn to play. To play, this learner places a card with a bigger number above the card on the table or a card with a smaller number below the card on the table, for example:

682

427

OR

427

269

The next player then gets a chance and may place a card with a bigger number above the upper card or a card with a smaller number below the lower card.
Play continues like this.

After some plays, the situation may look like this:

733

When a player does not have a suitable card, or does not recognize such a card he/she has, the next player around the table gets a chance.

708

The first player to play all his/her cards wins the game.

682

A situation may arise where all players still have cards, but all the held cards show numbers between the upper and lower numbers packed out on the desk.

427

In this situation, each learner should replace his/her cards with the same number of cards from the remains of the pack in the plastic bag, without putting cards back into the bag.

300

This procedure may be repeated if the need arises.

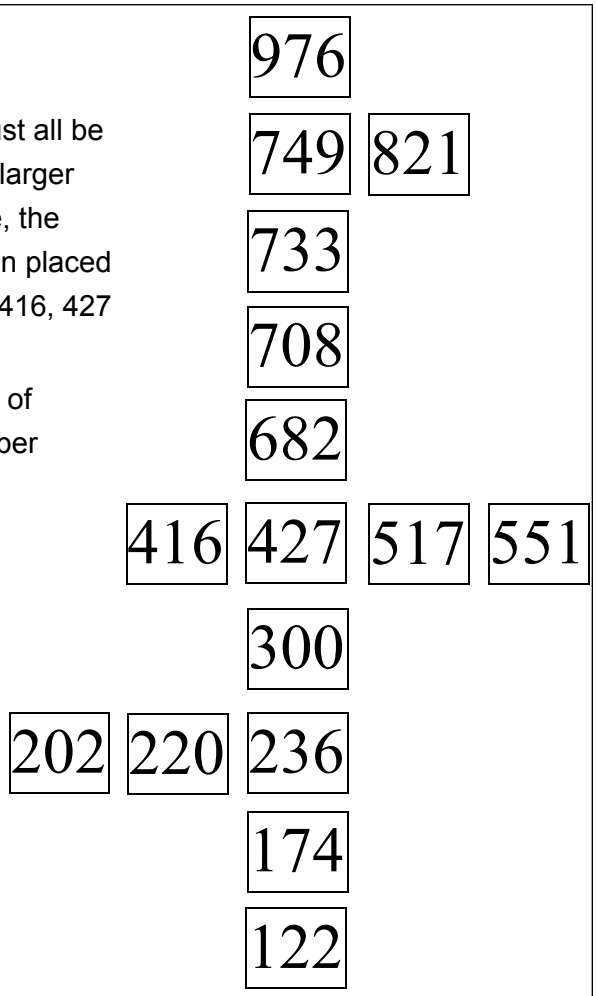
236

A situation may arise where there are not enough cards left in the bag for learners to replace the cards they hold. When this happens, the rules for placing changes. Learners may now place cards with bigger numbers to the right of cards already placed, or cards with smaller numbers to the left of cards already placed.

This will lead to a situation like the one shown here:

The numbers placed to the left and right in a row must all be smaller than any number in the next row above and larger than all numbers in the next row below. For example, the "551" in the situation on the right could not have been placed to the right of the "300", because 551 is bigger than 416, 427 and 517.

However, the 551 could have been placed to the left of the 682. This would make it illegal to place any number bigger than 551 to the right of the 517.



CONSOLIDATION

Activity 4:

Learners should write the numbers between 990 and 1025 in words, either in class or at home. You should mark this for assessment purposes.

WEEK 2: DAY 2

Notes to the teacher:

- This lesson is designed to consolidate learners' awareness of quantities more than a thousand. They will do this by counting given collections of objects (pictures and fake banknotes) and by counting in 25s and 20s.

Resources:

- A copy of Term 1 Resource K for each learner.
- A copy of Annexure F (Money sheets) for each learner.
- A copy of Annexure H (Number bond cards) for each learner, preferably printed on heavy and coloured paper.
- A pair of scissors for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1:

Hand out a copy of Term 1 Resource K (4 sheets with a total of 1185 apples in boxes of 10) for each learner. Ask them to find out how many apples there are, in total, on the four sheets and to write this total down.

Activity 2:

Hand out a copy of Annexure F (money sheets A to D) to each learner. Ask them to establish how much money is shown on each of the pages and to write this total down.

Circulate between learners. In cases where learners make mistakes in how they write the numbers in the positional notation, ask them to write the numbers in words and in expanded notation, and then try again to write the numbers in condensed notation. In cases where learners still make mistakes, ask them to represent the numbers with flard cards.

Activity 3:

Hand out a copy of Annexure H (Number bond cards) and a pair of scissors to each learner. They have to cut out the cards and put them into a container (e.g. an envelope). They should not mix these with the Number bond cards they have used in term 1.

Activity 4:

Within groups of no more than four, learners do the following activities, counting together but waiting for each other to be in step all the time:

1. Count in 25s up to 250.
2. Count in 25s from 400 to 650.
3. Count in 25s from 900 to 1100.
4. Count in 25s from 90 to 290.
5. Count in 25s from 690 to 890.
6. Count in 25s from 890 to 1090.
7. Count in 20s from 890 to 1090.
8. Count in any group size of their own choice, over any interval of their own choice.

Inform learners that in a week's time there will be a group counting competition in class. Each group will be allowed to count for three minutes. The groups will be judged on the level of difficulty of the counting task they perform; how many steps they manage to count in the three minutes; how few mistakes they make and the extent to which all group members participate during the competition. They should practice for the competition in their own time outside class.

WEEK 2: DAY 3

Notes to the teacher:

- In this lesson learners will have opportunities to work on real problems involving money. Learners will have fake banknotes so that they can represent the situations and think about them in real terms. This will enable learners to use practical ways of thinking to solve the given problems. It is important, however, that learners learn to represent their thinking symbolically (in writing). While some learners may do this easily and naturally, others will need considerable support from you.

Resources:

- A set of fake money notes (Term 1, Annexure O) for each learner.
- The set of flard cards for each learner.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Present the following problem to learners verbally:

Senthereng wants to buy a bicycle that costs R1324.

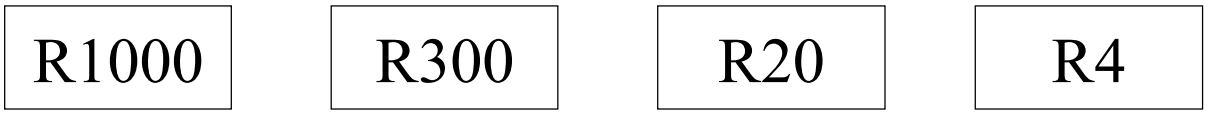
He has only R967. How much is he short?

Tell learners that are free to use their fake money notes and/or their flard cards, as well as expanded notation, to help them to figure this out. It is critical that learners work individually and that each learner feels quite free to do this in the way that makes sense to him/her. Encourage learners to describe their thinking in writing.

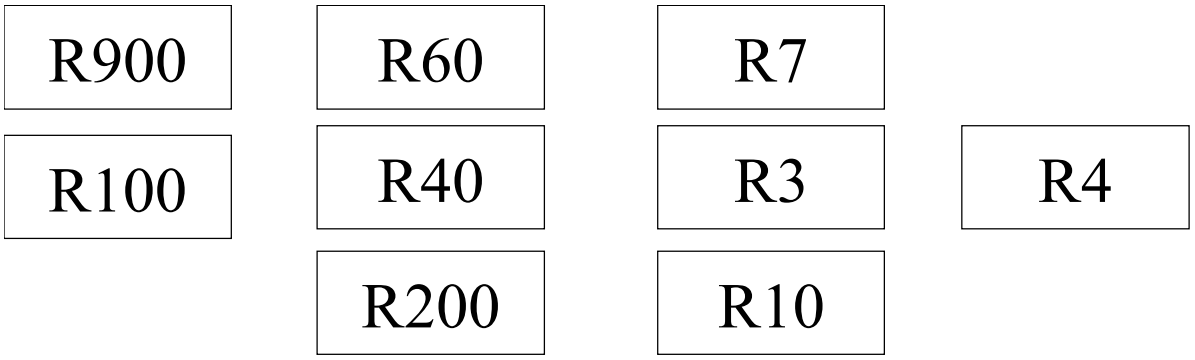
While learners start to work, write problems 2, 3 and 4 (see following pages) on the board, **so that learners who work quickly can be engaged all the time and do not get bored and restless**.

Circulate between the learners' desks and observe what they do. Encourage all learners to produce a clear written record of how they think (what they do with the numbers and parts of the numbers) to produce an answer. **Your learners will probably end up with a variety of quite different ways to deal with this situation**. For learners who use fake money notes to support their understanding and analysis of the situation, it may be quite a challenge to produce a written description, for example, a learner may represent the situation and analyse it as shown on the next page.

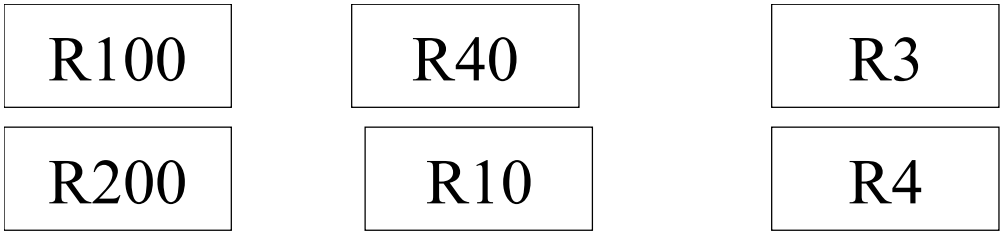
Step A



Step B



Step C



Step D



- In step A, the cost of the bicycle is represented with bank notes.
- In step B, the cost of the bicycle is represented again, but this time by showing the R967 separated from the R1324, as the money that Senthereng does not have.
- In step C, the part of the money that he does not have is shown on its own, somewhat regrouped with a view to put it together into one number.
- In step D, the money that Senthereng does not have is shown more clearly and one can now easily see that it is R357.

You should challenge any learner who does it like this, or in a similar way with the fake banknotes, to describe the same thinking in writing. The learners' attempts may be quite crude and you may need to provide some guidance to help the learner to produce something like the following:

1324 = 1000 + 300 + 20 + 4 = (900 + 100) + (60 + 40 + 200) + (7 + 3 + 10) + 4

= (900 + 60 + 7) + (100 + 200 + 40 + 10 + 3 + 4)

= 967 + (300 + 50 + 7)

= 967 + 357

By helping a learner to describe his/her own thinking symbolically like in the above, you help that learner to make substantial progress. The learner may not get it right immediately and may only develop good symbolic skills by working at a number of related problems, such as those given later in this lesson plan.

However, if learners are presented with symbolic descriptions of computational thinking before they have formed their own ideas, they may be unable to make any sense of it and are conceptually victimized. They then have no other way to deal with the situation in class than to simply learn to perform the demonstrated steps without understanding what they mean, why they can be performed and what is achieved by performing them. When this happens, the learner's chances of becoming numerate are put in serious jeopardy.

Other learners may think differently about Senthereng's situation and this may lead them to quite different computations. For example, a learner may think of Senthereng paying the money he has now and paying the shortfall at some time in future. This learner may then think of the events that will have to happen in future and argue that Senthereng will have to make up the amount to R1000 at some time (by paying another R33), and then paying the remaining R324 to fully settle payment for the bicycle. This thinking may be symbolically presented as follows:

967 + 33 → 1000 + 324 → 1324, and 324 + 33 = 357

Learners who think like this and are not aware of the arrow-notation, may write as follows and may unintentionally misuse the equal sign in the process:

967 + 33 = 1000 + 324 = 1324

You should intervene with learners who write like this and point out to them that although they may not mean it, they are stating an untruth by saying that 967 + 33 is equal to 1000 + 324.

It is possible, though unlikely, that some learners in your class will recognise that the situation can be resolved by doing subtraction in some way or another. This would indicate a quite advanced understanding of the meaning of subtraction.

Some learners in your class may only have time to work on the first problem, while others may work quickly and also do some or all of the following problems. Learners will get an opportunity to work on more of the problems tomorrow.

Problem 2

Jemima buys clothes for R1247 and she pays with three R500 notes. How much change should she get?

Problem 3

Geraldine buys clothes at a shop. She pays R2000 and gets R342 change. How much did she pay for the clothes?

Problem 4

Temba goes to town to buy a bicycle. He takes all his savings of R1737 with him. He buys the bicycle and nothing else and returns home with R574. How much did he pay for the bicycle?

Problem 5

Moses wants to buy a bicycle. He has seen two bicycles that he likes. The one costs R1247 and the other one costs R1353. What is the difference between the prices?

Problem 6

Thabile goes to town to buy a bicycle. She takes all her savings with her. She buys the bicycle for R1586, but nothing else. She returns home with R352. How much money did she take with her to town, before she bought the bicycle?

Remind the class about the group counting competition that was announced in Week 2 on day 2. The competition will take place next week Tuesday.

WEEK 2: DAY 4

Notes to the teacher:

- Learners work further on the problems given in the previous lesson plan.
- In the second part of the lesson, learners play the Number Placing game with numbers between 1000 and 2000.

Resources:

- A set of Annexure B (Number cards 1000 to 2000) for each group of three or four learners.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1 (25 minutes):

Learners continue to work on the problems of the previous day.

Circulate between the learners and assist learners who have difficulties in describing their methods in writing, as suggested in the previous lesson plan.

ORAL AND MENTAL ACTIVITIES

Activity 2:

Arrange learners in groups of three or four learners. Ensure that each group has a set of 1000 to 2000 cards (Annexure B). Learners play the Number Placing game (as in Week 2, Day 1), but now with 4-digit numbers..

Remind the class about the group counting competition that was announced in Week 2 on day 2. The competition will take place next week Tuesday.

WEEK 2: DAY 5

Notes to the teacher:
- This lesson is devoted to the development of mental addition, subtraction and multiplication skills and knowledge.

Resources:
- The sets of number bond cards (Annexure H) cut during Week 2, Day 2.
- The sets of multiplication fact cards (Annexure K) cut during week 1.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1 (20 minutes):

Learners individually work on their knowledge of multiplication facts by doing activities 3, 4 and 5 described in the lesson plan for Week 1, Day 3.

ORAL AND MENTAL ACTIVITIES

Activity 2:

Arrange learners in groups of three or four. Each group must have a set of number bond cards (Annexure H) cut earlier in the week. They should play the number bond game as described in the lesson plan for Term 1, Week 4, Day 1.

SECOND TERM: WEEK 3 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 1 AS 6, 8, 9 and 11. LO 3 AS 1.	**Milestones:** • Solve problems by addition and subtraction. • Counting in a variety of intervals (including 2s, 3s, 5s, 10s, 25s, 50s and 100s) starting from any number between 0 and 2000. • Recognises, identifies and names three-dimensional objects including cubes and rectangular prisms, spheres and cylinders. • Draws, sorts and compares physical three-dimensional objects (listed above) according to geometrical properties including shape and number of faces.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Mental arithmetic: up and down the number line, counting in intervals. Working at problems that involve addition and subtraction.	Counting competition. Working at problems that involve addition and subtraction.	Mental addition and subtraction. Working at problems that involve addition and subtraction.	Working at problems that involve addition and subtraction.	Investigate three-dimensional objects.
Resources	Fake banknotes (Term 1 Annexure O). Annexure M.		Annexure H (Number bond cards).		A variety of boxes and other objects.

WEEK 3: DAY 1

Notes to the teacher:

- Activity 2 is actually a collection of problems that are all about combining three quantities. Learners who need it may use the false banknotes to figure out these questions.

Resources:

- A copy of Annexure M (Number Journeys series 2) for each learner.
- Four copies of the third sheet (Journey X) of Annexure A for each learner.
- The set of fake banknotes (Term 1 Annexure O) for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1:

Hand out copies of Number Journey C. Tell learners that this was a number journey completed by someone else, but that part of it was rubbed out. They have to find out what was rubbed out and fill it in again. They then have to do Journey B.

Activity 2:

Tell learners that a group of friends went shopping together to buy groceries, clothes and presents. Some information about their shopping is given in the table below which you should write on the board. Learners should copy the table into their workbooks.

	Groceries	Clothes	Presents	Total
Joachim	R678	R532	nothing	?
Temba	R886	nothing	nothing	?
Felicity	R581	R342	R145	?
Precious	nothing	R776	?	R1010
Susan	R378	?	R238	R879
Total	?	?	?	?

When learners have finished copying the table, tell them that they have to find out how much money Joachim spent all together and write that into the table. They also have to find out how much the five friends together spent on groceries and fill that in at the appropriate place in the last row of the table. They should then continue to figure out what number should be in place of each of the other question marks. Learners who want to use fake banknotes to support their thinking should feel free to do so.

Circulate between learners and assist those who need help to understand the question.

Do not help them by telling them what calculations to do. For instance, do not tell them they have to add to find the total Joachim has spent. (They have to learn to figure out for themselves what operations to do, because that is what they need to do in life.)

However, you should help them to understand the question if they have difficulty doing that. For example, if they do not understand what “total” means, you have to tell them that it means “all together”. You may also have to show learners how a table like this works, for example that the totals on the right are the totals for each person, while the totals at the bottom are the totals for each kind of expenditure.

Activity 3:

For homework, learners have to do four number journeys exactly like D, with the numbers 35, 60, 23 and 45. They have to do this on the copies of Journey X that you hand out and label the new journeys “Journey 35,” “Journey 60,” etc. They have to write their names on the sheets and hand it in the next day.

Remind the class about the group counting competition that was announced in Week 2 on Day 2. The competition will take place tomorrow.

WEEK 3: DAY 2

Notes to the teacher:

- In the first half of the lesson learners continue to work on the shopping task. In the second half of the lesson they have a group counting competition.

ACTIVITIES FOR THE DAY

CONSOLIDATION

Activity 1:

Learners continue to work and preferably complete the shopping task started the previous day.

ORAL AND MENTAL ACTIVITIES

Activity 2:

Hold the group counting competition. Each group should come forward and may count together for two minutes. Assess each group according to the following rubric:

Points	1	2	3	4	5
Number range	Below 100	Up to 200	200 - 1000	More than 1000	More than 2000
Counting interval	Easy single-digit e.g. 5	Tricky single-digit e.g. 7	Easy 2 or 3-digit e.g. 20 or 100	Tricky two-digit e.g. 27	Tricky 3-figit e.g. 130
Participation	More than one dropping out		All but one		All
Number of steps in 2 minutes	Less than 10	10 - 30	30 - 70	70 - 100	More than 100

WEEK 3: DAY 3

Notes to the teacher:

- In this lesson learners first do some consolidation of their mental addition and subtraction skills, then they tackle another set of problems. The problems will require them to do both subtraction and addition.

Resources:

- A copy of the larger number bond cards (Annexure H) for every three learners.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITIES

Activity 1 (20 minutes):

Learners play the number bond game, as described in the lesson plan for Term 1 Week 4 Day 1, with the larger number bond cards (Annexure H). Do not allow more than 4 learners per group.

CONCEPT DEVELOPMENT AND PROBLEM SOLVING

Activity 2:

Write the table below on the board. Explain to learners that the last column is for the money that each person has left, after paying his/her house rental and transport costs for the week.

	Monthly income	House rental	Travel cost	Available
Joachim	R1680	R780	R172	?A
Temba	R1495	R610	?B	R478
Felicity	R1735	?C	R484	R435
Precious	?D	R640	R228	R833
Susan	R1226	R988	R496	?E
Total	?F	?G	?H	?I

Learners should describe in words and write down what each of the numbered question marks mean, and how they will calculate the amount that should be written there, without actually doing the calculations.

They should then discuss their ideas in small groups.

Finally they should do the calculations on their own (individually). They will not finish this work today and will continue tomorrow.

WEEK 3: DAY 4

Notes to the teacher:

- The purpose of this lesson is to support learners in becoming more sophisticated in the ways in which they do addition and subtraction.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1:

Learners continue to work individually on the budget problems given on the previous day.

Circulate between learners and observe the methods they use.

Use this opportunity to assess learners' computational skills individually, and make notes in this regard.

You may also take in some work done by learners, for assessment in your own time.

Identify some of the learners' more elegant and interesting methods and prepare to demonstrate these on the board later.

Activity 2:

Demonstrate some of the methods that learners used on the board.

WEEK 3: DAY 5

Notes to the teacher:

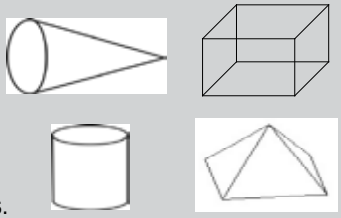
It is very important for learners to handle, compare and contrast actual 3-d objects. Sets of objects can be bought but one can improvise using articles from around the house and school. Ask your learners a few days before the lesson, to start collecting the articles and bring them to school. Learners will also make a set of 3-d objects, using dough, to use in the next lesson. In this lesson they will work with 3-d objects that will include:

- cubes and rectangular prisms;
- spheres and cylinders.

They will determine the geometric properties of these in relation to:

- number and shape of faces;
- flat or curved surfaces.

It is important that learners understand that we cannot actually create a 3-d object on paper by drawing. Rather we use certain conventions to show three dimensions on paper. For example, we use these kinds of drawings to show 3-d objects:



Your eye tells you that these drawings are 3-d, but they are actually flat. Learners need to have many experiences with actual objects, to help them to link these images to the objects.

Resources:

- A collection of 3-d objects (sufficient so that each group will have at least 8 - 10 objects altogether) that includes cubes and rectangular prisms and spheres and cylinders. It would be ideal if you had a bought set of 3-d objects, but if this is not possible, you can collect items from around the house and school, for example: cool drink cans, the inside of toilet rolls, rolls of sweets, round pens or pencils, tubs of cream, match boxes, balls, dice, dominoes, ice cream cones, lip stick, bricks, boxes, margarine tubs, building blocks, unifix blocks, empty cans from canned foods like vegetables or fish, empty pill bottles, empty medicine boxes.
- Play dough for making shapes.
- Jotters and a pencil.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Learners work in small groups with their collection of 3-d objects. Explain to them that they must put the objects into two groups and be able to tell you why they are sorting them as they are. As they do this, walk between the groups and listen to their discussions and reasoning. Make a note of groups that have different groupings.

(You may find that all groups put the cylinders, spheres and cones together and the cubes and rectangular prisms together. Learners will more than likely tell you that the one group all have something or a side that is rounded and the other have a square or rectangle for a side. If this happens then let one or two groups explain their work to the class and ask if any groups have different reasons for making the groups this way. Let them tell the class and discuss the reasoning.)

Now move on to asking learners if they can think of another way to group these objects. Give learners time to talk and try out their ideas. When the class has finished discussing their ideas, ask a group to come up and show the class how they grouped the objects and give their reasoning. Call out another group with a different grouping of the objects. Let them come up and demonstrate theirs. Repeat this with a few groups. Discuss the differences in grouping and if there is a single right or wrong way.

If all groups had the same grouping of objects, ask learners to see if they can arrange these same objects in any other way. They may then group the cylinders, cones, the cubes and rectangular prisms together in one group and the spheres in a group of their own. A learner from each group explains the reasons for their groupings. Encourage learners to explain their reasoning to you in their own words. They may say that all the objects in one group have straight sides, while the spheres are completely round. Note: items should not be grouped according to size but rather geometric properties.

Ask the groups to look at the cubes and rectangular prisms. They must identify in what ways they are all similar and how they differ, in terms of geometric properties, e.g. all have straight sides and flat surfaces; the cube has all square faces; one has two square faces; and the last has all faces that are rectangles. Let learners report back using their own words. Learners do not have to name the objects at this stage.

Hand out the play dough. Learners each make their own set of 3-d objects – spheres, cylinders, cones, cubes, rectangular prisms: one with two square and four rectangular faces and a second one with all rectangular faces. Demonstrate the approximate size you would like. The faces of the cube should be about 2 cm x 2 cm and the other objects a similar size. Explain to learners that the straight sides must be straight and they may need to use a ruler to give the straight edge. Learners put these aside to use in the next lesson.

If there is time left in the lesson, take your class outdoors with their jotters and a pencil. Ask learners to walk around the school and find examples of 3-d objects, similar to the types studied in the earlier part of the lesson. Learners work independently. They make a rough sketch of each object and/or write the name or place where they found the object. They work in groups and compare the objects they found and check whether they are correct or not.

SECOND TERM WEEK 4

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 2 AS 1 LO 3 AS 1 and 2	**Milestones:** • Recognises, identifies and names three-dimensional objects including cubes and rectangular prisms, spheres and cylinders. • Draws, sorts and compares physical three-dimensional objects (listed above) according to geometrical properties including shape and number of faces. • Investigate and extend numeric (to at least 2 000) and geometric patterns looking for general rules or a relationship, including patterns

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Investigate three-dimensional objects.	Investigate three-dimensional objects.	Investigate three-dimensional objects.	Investigate three-dimensional objects.	Geometric and number patterns
Resources	A variety of boxes and other objects.	A variety of boxes and other objects.	A variety of boxes and other objects.	A variety of boxes and other objects.	Annexure L.

WEEK 4: DAY 1

Notes to the teacher:
Begin the lesson by playing a team game to revise 2-d shapes taught in Term 1. Introduce learners to the terms (face and surface) in relation to 3-d objects. Learners will identify the shape and name the 2-d shape of each face, of the 3-d objects they made the previous day. They will also discuss the surface of each face of the shape, as to whether they are flat or curved.

Resources:
- Set of dough 3-d objects (made in the previous lesson).
- Stamp pad.
- Worksheet or table drawn on board which learners will use to record their work.
- Chart showing 2-d shapes, as taught in Term 1.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

- Begin the lesson by revising 2-d shapes from Term 1.
  Play a team game. Divide your class into teams of 8 – 10 learners – make sure they are mixed ability groups. One learner from each team comes up and, on the board, writes the answer to the question you pose. You may:
  a) draw a 2-d shape on the board and learners write the name (spelling does not count); or
  b) you read out a description of a shape, e.g. I have three straight sides, what am I? or
  c) you say the name of the shape and learners draw the shape.
  Playing a game keeps many learners involved at once. Award points for correct answers and reward the winning team.

- Hold up a large cube and while you point to one of the faces, ask learners if they can think of a name (not the name of the shape) for it. Let them give you suggestions and some may give you the correct answer – face. Display the 2-d shape chart from Term 1 and explain to learners that they will need to refer to this to check the correct spelling of the shape of the faces.

- Learners work in small groups with their 3-d objects made the previous day. Although they are working in groups, learners record their work individually. Explain to the learners that they are going to take one object at a time and make a print of each of the different faces. Learners may find it easier to record their findings in a table. Below is an example of a table that may be used. Learners will need to add as many rows to the table as they need.

Name of shape (to be filled in the next lesson)	Sketch of 3-d object	Stamp of face	Name of 2-d shape	Flat or curved surface

They stamp the faces of their 3-d objects in the stamp pad and then in the space on the table. They sketch the 3-d object, as well as naming the shape of the face and recording whether it has a flat of curved surface.

Encourage learners to talk about the objects and shapes as they work. Keep walking between the groups as they work and question them and check their work. Guide any learners who are experiencing difficulty.

If there are groups that finish before the others, let them join together and discuss their 3-d objects and the shape of the faces and whether the sides are flat or curved.

You will need to mark/correct this work as learners will use it in the next lesson.

WEEK 4: DAY 2

Notes to the teacher:

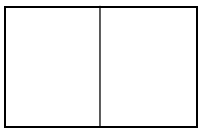
- Learners will discuss the shape of the faces of the 3-d objects by reporting back on their work from the lesson before.
- You will also introduce the names of the relevant 3-d objects.
- Learners will make 3-d objects from paper and/or card. Save these for use on Day 5
- For your information:
  A ball / sphere has only one curved face;
  An open cylinder (like a used toilet roll) has one curved face;
  A cylinder closed at both ends, has one curved face and two circular faces at either end;
  A cylinder closed at one end, has one curved face all around and one circular face at the end;
  An open cone has one curved face that joins to form a point;
  A closed cone is the same but has one circular face at the bottom;
  A square prism or cube has six faces, all of them squares;
  A rectangular prism has six faces, some of these can be squares, others rectangles, but in either case, the opposite sides are the same shape.

Resources:

- Chart showing 2-d objects as used in Term 1.
- Individual charts each naming the following 3-d objects: a) spheres; b) cylinders – open ended and closed; c) cones – open ended and closed; d) cubes; e) rectangular prisms with two square faces and also an example with all rectangular faces. You may have pictures of the objects as well as actual 3-d objects to stick (with prestik) over the drawings at first.
- Sheet of A4 paper per learner for making 3-d objects.
- Cellotape or glue.
- Copies of cube template printed on card, or for learners to trace onto card.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

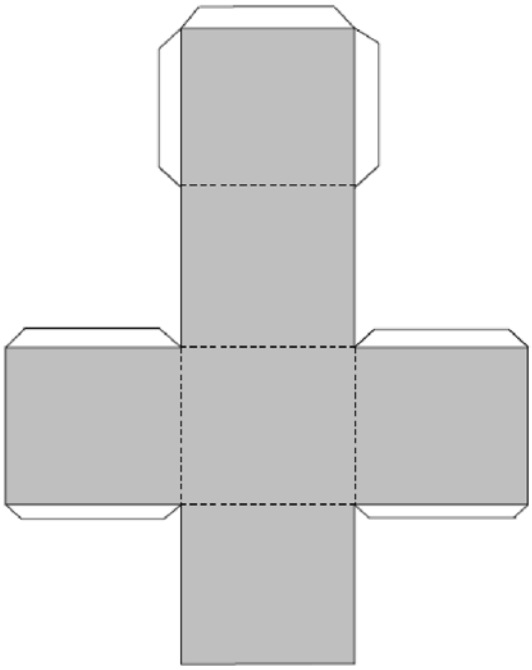


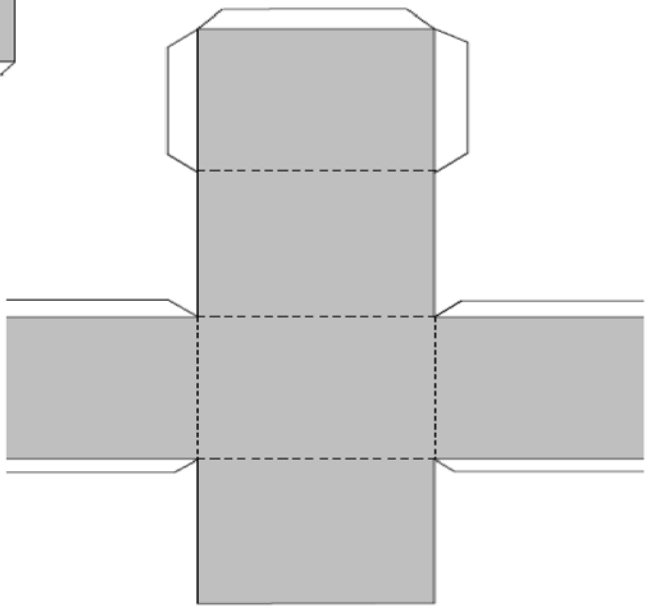
Give each learner a piece of A4 paper. Ask them to tear it in half.
Show learners to form a roll with the paper, with just the long edges touching. Put a small piece of cellotape or sticky tape on the edge. Learners hold it up for you to see. Ask if anyone can tell you the name of this 3-d object – a cylinder.
Display the chart of the cylinder.
Now ask them to make the cylinder into a 4-sided shape with straight sides and all the closed faces being the same size, without removing the tape. Give learners time to work it out. They simply squash it flat and fold it in half again. Now ask if anyone can tell you the name - a rectangular prism.
Display the chart showing the rectangular prisms (these must include all types, i.e. rectangular prisms with two square faces and also an example with all rectangular faces). As you discuss each example with learners, ask a few learners to hold up actual 3-d objects. Learners refer to the chart and each object in turn, in order to name the 3-d object. Discuss the name of the shape of each of the faces and whether the surfaces are curved or flat.
Refer learners to the remaining half of their A4 paper. Ask learners to use it to make a flat, round hat. They may cut off the “extra” point, to make the lower edge straight. Ask learners what this 3-d object is called – a cone. They may decorate this with 2-d shapes when they have completed their work.
Learners now take out the tables they made in the previous lesson and below the sketch of each 3-d object they write the name of the 3-d object, e.g. cone, cube, etc.

Learners use the template to trace a rectangular prism (or the copy on card you have given them). Learners cut out the figures, one at a time, and fold along the lines and glue the 3-d object together.

As learners are constructing their objects, walk between them and ask them to name the shape of the faces and tell you the number of faces on each object. Let learners make a label to name each of their 3-d objects.

Here is an example of the template that you may give to learners. It is not drawn to scale, so you will need to adjust the dimensions.





WEEK 4: DAY 3

Notes to the teacher:

- Learners will make 3-d gift boxes using given shapes. They answer questions about each 3-d object relating to the number, shape and surfaces of the 3-d objects.
- Learners save these for Day 5.

Resources:

- Shapes needed to make the gift boxes. These can be in the form of ready printed sheets on card or templates made of card that learners will trace around and cut out. These may be cut out using the thick covers of magazines.
- Extra piece of card for learners to design their own 3-d object that will serve as a container for chocolates.
- Cellotape/ sticky tape.
- Scissors.
- Jotters and pencils.

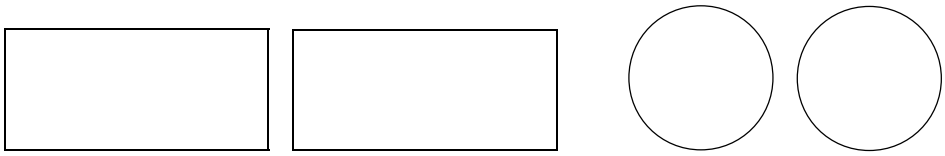
ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Learners will work independently and make boxes/containers using given shapes. You will need to provide a worksheet that gives them the shapes needed to make 3-d objects. You may choose to give learners cardboard templates that they can trace around onto card or thick paper from magazine covers. Learners also answer the questions below relating to the objects they have made, in their book.

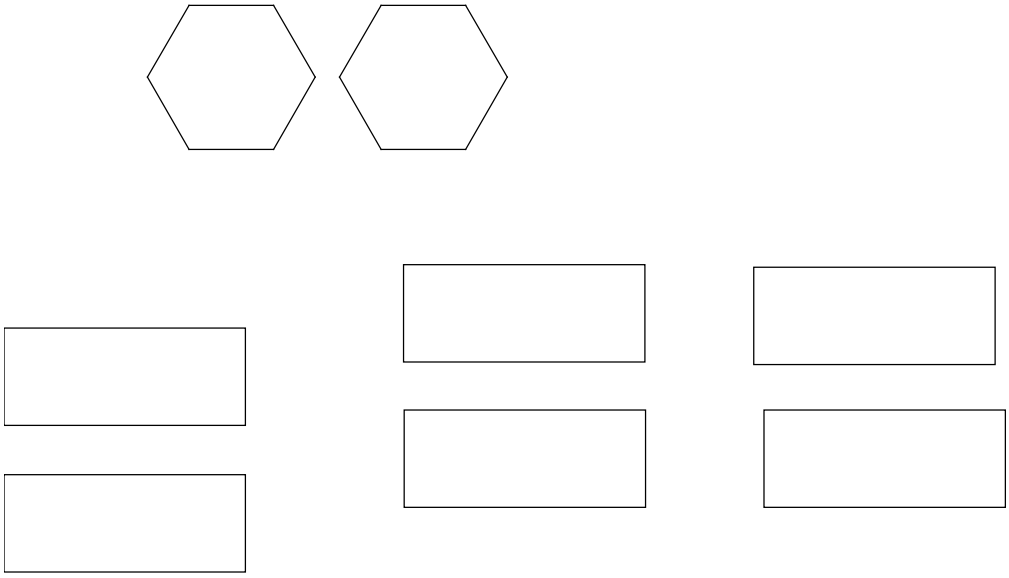
Mrs Mthembu has made chocolates and needs boxes to sell them in. Use the following shapes to make containers for her. Cut them out and then use sticky tape (cellotape) to join them together. **NB:** You must ensure that your measurements are accurate and that the pieces will actually fit together to form a 3-d object.

a)



- Name the object you have made.
- How many faces does it have?
- Name the shape of face.
- Describe the surface of each face (curved or flat).

b)



- Name the object you have made.
- How many faces does it have?
- Name the shape of each of the faces.
- Describe the surface of each face (curved or flat).

c) Learners choose shapes of their own to make the third container and answer the same questions as before. It must be one of the 3-d objects studied this week.

- Name the object you have made.
- How many faces does it have?
- Name the shape of face.
- Describe the surface of each face (curved or flat).

WEEK 4: DAY 4

Notes to the teacher:

- This lesson serves as an assessment against the milestones.
- Learners will identify/name actual 3-d objects using the dough shapes made earlier.
- Learners will identify the number and shape of faces on 3-d objects, as well as describe the surface of each.
- Set up activity areas where learners move to complete parts of the exercise.
- Although the 3-d objects are in small groups, learners will each complete their own worksheet independently.

Resources:

- Worksheet or similar activity where learners identify the number and shape of faces on 3-d objects, as well as describe the surface of each.
- Sufficient groups/collections of 3-d objects so that learners may work with them, in small groups.
- Have the similar objects at each group but label them in a different order. Remember to number each of the groups so you can identify each learner's collection, e.g. Group 1: cylinder – A, sphere – B, rectangular prism – C; Group 2: rectangular prism – A, cone – B, etc.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT AND ASSESSMENT

In order for learners to use actual 3-d objects to complete this task, you will need to provide either dough or bought 3-d objects. Containers may also be used. These may include cereal boxes, cans or lunch boxes. Be sure to have an example of each type taught in the above lessons.

Display the labelled groups/collections of 3-d objects, where each group of learners can see them or have access to them. Hand out learner worksheets. Learners may go up to the objects and actually count the faces, etc. Learners work independently and complete a worksheet similar to the following:

Name: _____ Group: _____

1. Name of 3-d object: _____
   Number of faces: _____
   Draw each face in the space below and write its name. Is the surface curved or flat?

2. Name of 3-d object: _____
   Number of faces: _____
   Draw each face in the space below and write its name. Is the surface curved or flat?

3. Name of 3-d object: _____
   Number of faces: _____
   Draw each face in the space below and write its name. Is the surface curved or flat?

Have a set of questions like the above ones for each object. Leave enough space so learners can draw the faces and write the names of each.

ASSESSMENT	**Formal assessment** against the milestones:
	• Recognises, identifies and names three-dimensional objects including:
	  • Cubes and rectangular prisms;
	  • Spheres and cylinders.
	• Draws, sorts and compares physical three-dimensional objects (listed above) according to geometrical properties including:
	  • Shape and/or number of faces;
	  • Flat and curved surfaces.

WEEK 4: DAY 5

Notes to the teacher:

- This is a very different kind of lesson than most mathematics lessons. Give learners some patterns, and ask them to think of other patterns that may be similar, but also different.

Resources:

- A copy of Annexure L (Bead patterns0 for each learner.

Activities for the day

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Hand out copies of Annexure L. Let learners work in groups of two or three. Ask them to describe to each other what they see on the sheet. Allow about 5 minutes of discussion, or until learners do not seem to have to say anything more.

Activity 2

Learners must now work individually. Tell them that there atre several things they may do. For example they may draw more similar patterns. Alternatively, they may count the beads in each of the patterns.

You may also tell them that the person who made the drawings did not finish the job. She still had more patterns that she wanted to draw. When somebody asked her which other patterns she still wanted to draw, she said B4. Suggest to learners that they try to think what she may mean with “B4” and try to draw it.

Give learners some time. If they become active and productive, you may allow them to work till the end of the lesson. Circulate and try to establish what learners are doing.

If learners become inactive, do activity 3.

Activity 3

Suggest to learners that they count the number of beads in each pattern, and write the number below the pattern. While they work on this, ou may write the following on the board:

How many beads do you think there may be win the patterns with the following codenames?

A7, B4, B5, C4, C5, D4. D6, E2, E3, E4, E5, F3, F4.

SECOND TERM: WEEK 5 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: **LO 1 As 6, 7, 8, 9**	**Milestones:** • Solving problems that involve addition, multiplication, grouping and sharing. • 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	Mental and written multiplication	Problems that involve multiplication, grouping and sharing	Problems that involve multiplication, grouping and sharing	Mental multiplication	The concept of rate.
Resources:		Roll of string Scissors		Copy of Annexure K	A watch on which minutes can be read accurately.

WEEK 5: DAY 1

Notes to the teacher:

- The purpose of the work in this lesson is to develop the idea that a number can be broken up into parts for the purposes of multiplying it with another number. For example, to calculate Sibusisu's tariff for a trip of 38 km with the truck, one may use the table to see that for 8 km the tariff is R272 and for 30 km the tariff is R1020, so the total tariff is R272 + R1020 = R1292. Later, your learners will learn to do multiplication like this: 38 × 34 = 30 × 34 + 8 × 34

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Tell your learners about Sibusisu who runs a small transport business with his bakkie and his 5 ton truck. He charges R34 per kilometer for carrying heavy loads with the truck and R7 per km for carrying small loads with the bakkie. Sibusisu does not have a calculator. He wants to have tables like those below to help him to do the calculations for when he has to tell a client how much it will cost to transport his goods. Write the tables on the board. Learners should copy and complete the tables. It will take them quite a while to complete the tables.

Distance	Truck cost	Bakkie cost
1 km	R34	R7
2 km	R68	R14
3 km		
4 km		
5 km		
6 km		
7 km		
8 km		
9 km		
10 km		
20 km		
30 km		
40 km		
50 km		
60 km		
70 km		
80 km		
90 km		
100 km		

Then give learners a variety of cost calculations to do, for example:

1. A truck trip of 27 km.
2. A bakkie trip of 38 km.
3. A truck trip of 36 km.
4. A bakkie trip of 48 km.

WEEK 5: DAY 2

Notes to the teacher:

- The focus is on grouping problems in the context of cutting a string. Learners will probably do this by repeated addition. The work of the next two days provides for learners to become more sophisticated and use faster methods for sharing and grouping problems and multiplication.

Resources:

- A roll of string and a pair of scissors.
- A copy of the first sheet of Annexure N for each learner.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1:

Show the roll of string to the class and tell them that you want to cut off pieces that are exactly 25 cm long. Let one or two learners help you to cut off some 25 cm pieces. Then ask learners how many pieces they think you will be able to cut from the roll, before all the string is used up. Allow some discussion. Ask the class what one would need to know in order to be able to calculate how many pieces can be cut. Do not take answers from individual learners. Ask them to talk about it in groups of two or three.

Circulate between the learners. When you find that most learners realise that one needs to know the total length of string on the roll, stop the discussion and tell them they now have to work individually. They have to find out how many pieces of 25 cm each can be cut from a roll of string if the roll is 2 metres long.

Turn away from the learners for about three minutes, so that they clearly get the message that they are supposed to tackle the question by themselves.

Circulate between learners. Ensure that they work individually. Observe how they work. You may note that some learners add 25 repeatedly, while others may subtract 25 repeatedly, starting from 2000. Do not be surprised if few or no learners do the latter.

If some learners finish quickly, write the following questions on the board and let them do it:

1. How many 25 cm lengths can be cut from 1,7 m of string?
2. How many 25 cm lengths can be cut from 1,2 m of string?
3. How many 25 cm lengths can be cut from 1240 cm of string?
4. How many 24 cm lengths can be cut from 1 m of string?

Activity 2:

When all learners have solved the first problem, hand out copies of the first sheet of Annexure N for classwork and homework.

WEEK 5: DAY 3

Notes to the teacher:

- Learners will do some grouping problems today. The multiplication work in Activity 1 may result in some learners doing Activity 2 more effectively than adding the string length repeatedly.

Resources:

- Learners' copies of "Journey 35", "Journey 60", "Journey 23" and "Journey 45" that they completed on Week 3 Day 1 for homework.

ACTIVITIES FOR THE DAY

ORAL AD MENTAL ACTIVITIES

Activity 1:

Learners must have their copies of the Journeys 35, 60, 23 and 45 with them.

Write the following table on the board:

	35	**60**	**23**	**45**
10 ×	350			
20 ×		1200		
25 ×				
30 ×				
2 ×				
4 ×				
8 ×				
5 x				
15 x				

Challenge learners to figure out how the table works and ask how it is connected to the number journeys that they have completed. Allow discussion in small groups.

Terminate the discussion and let learners copy and complete the table, individually.

PROBLEM SOLVING

Activity 2:

Write the following problems on the board. Learners should start working on them once they have completed the table.

A roll of string is 1,8 m long. How many 60 cm pieces can Susan cut from it?

A roll of string is 1,8 m long. How many 35 cm pieces can Susan cut from it?

A roll of string is 1,5 m long. How many 45 cm pieces can Susan cut from it?

A roll of string is 1,8 m long. Susan cuts it into 60 equal pieces. How long is each piece?

A roll of string is 1,5 m long. How many 28 cm pieces can Susan cut from it?

A roll of string is 1,8 m long. Susan cuts it into 28 equal pieces. How long is each piece?

WEEK 5: DAY 4

Notes to the teacher:

- Learners will practice mental multiplication skills in Activity 1, and solve some multiplication problems. They will also work further on the problems set on the previous day.

Resources:

- A copy of the multiplication fact cards (Annexure K) for every three learners.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITIES

Activity 1 (20 minutes):

Learners play the Number Bond game, as described in the lesson plan for Term 1 Week 4 Day 1, with the multiplication fact cards (Annexure K). Do not allow more than 4 learners per group.

PROBLEM SOLVING

Activity 2:

Write the following problems on the board:

Jason must make 45 lengths of string, each 28 cm long. How much string does he need?

Maggie must make 38 lengths of string, each 23 cm long. How much string does she need?

Musa must make 56 lengths of string, each 17 cm long. How much string does he need?

Jerry must make 28 lengths of string, each 45 cm long. How much string does he need?

Allow learners to work on these problems on their own, individually.

Activity 3:

Learners continue to work on the problems given on the previous day.

Take some work in for assessment.

WEEK 5: DAY 5

Notes to the teacher:

- One of the harder concepts in mathematics is the idea of a "rate". One way to understand it is to say the rate of something is "how fast" it happens, or how often it happens in a given time. For example, one sick person may have to visit a clinic two times a week, while another sick person has to visit the clinic 5 times a week. One would say that the second person visits the clinic at a higher rate than the first person. In this lesson, learners get an opportunity to form an idea of rate.

Resources:

- The tally charts that learners produced in Term 1 Week 1 Day 4 (homework).
- A watch so that you can tap for periods of precisely 3 minutes each.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1:

Remind learners what a tally chart is by showing them a tally chart on the board, or hand out copies of the tally charts they made for homework in Term 1 Week 1 Day 4.

Activity 2:

Tell the class you will tap on the table for three minutes and that they must make a tally mark for each tap. Make about one tap every two seconds, using a suitable hard object so that all learners in the class can clearly hear each tap. Tap for 3 minutes and count your number of taps, so that learners can check their answers against yours.

Learners now have to count their tallies and write down the total number of taps over the three minutes. They should write their report as follows (demonstrate this on the board):

In period A, teacher made 93 taps in 3 minutes.

Repeat this activity but now tap slower, making about one tap every 5 seconds for 2 minutes. Again make sure that learners write their observation in the above way:

In period B, teacher made 23 taps in 2 minutes.

Again repeat the activity but now tap faster, about one tap every second for 1 minute only. Again make sure that learners write their observation in the above way:

In period C, teacher made 61 taps in 1 minutes.

Activity 3:

Ask learners the following question:

When did I tap fastest, during period A or period B or period C?

Especially in a multilingual class or where instruction is not in the mother tongue, have some discussion about the word "fastest" and use the corresponding word in the language that learners know best.

Activity 4:

Tell learners that in a similar situation, the following data was collected (write it on the board):

In period X, the teacher made 72 taps in 3 minutes.

In period Y, the teacher made 86 taps in 3 minutes.

In period Z, the teacher made 59 taps in 3 minutes.

Ask the question:

When did the teacher tap fastest, during period X or period Y or period Z?

Allow some discussion.

Tell learners that in another similar situation, the following data was collected (write it on the board):

In period P, the teacher made 72 taps in 4 minutes.

In period Q, the teacher made 86 taps in 5 minutes.

In period R, the teacher made 59 taps in 3 minutes.

Ask the question:

When did the teacher tap fastest, during period P or period Q or period R?

Allow discussion. Learners will probably not be able to produce a satisfactory answer and this is not the intention. **Do not try to resolve the issue now, it is beyond the capacity of the majority of learners of this age.**

The purpose of the last activity is to make learners aware of the fact that it can be very problematic to answer a question like this. You may tell them that in future lessons, both this year and in later years, they will have opportunities to learn to answer questions like this. You may also tell them that this is a very difficult kind of question.

SECOND TERM: WEEK 6 OVERVIEW

Hours: 5				**Number of periods: 5**	
Learning Outcomes and Assessment Standards LO 5: Data AS: 8		**Milestones:** • Say whether a predicted event is certain to happen, is certain not to happen, or is uncertain. • Give reasons for an opinion about a predicted event, by using a 'why will it happen?' type of reasoning or a 'how often will it happen?' type of reasoning. • Arrange a set of uncertain statements from the most uncertain to the least uncertain. Realise that it helps to ask the following question for each statement when you try to arrange the statements: "How often will it happen in a large number of opportunities for it to happen?"			
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Learners learn to tell when one cannot make a prediction with complete certainty. They also learn to give reasons for their opinions about predictions by using 'why?' and 'how often?' types of reasoning.	Learners learn to tell when one cannot make a prediction with complete certainty. They also learn to give reasons for their opinions about predictions by using 'why?' and 'how often?' types of reasoning.	Learners consider a set of statements. They give their opinion of each, and they give reasons for their opinions, using full sentences.	Play a game of chance by tossing a coin. Count how many times different outcomes occurred.	Learners arrange a set of statements from most uncertain to least uncertain.
Resources			5 cent coins		

WEEK 6: DAY 1

Notes to the teacher:

- This week's lesson series introduces the learners to the concept of uncertainty. This is the most important topic in the learning outcome 'Data handling and probability', and this topic will be dealt with up to grade 12, gradually developing learners' understanding of uncertain situations and their ability to say something useful about these situations. We will of course just make a very small first step with this topic with the grade 4's in this week.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Write the following statement on the board: "It is a hot sunny day, and the water in the dam will freeze."

Ask your learners to work in groups of 3 to 4 and discuss this statement, while considering the following questions (write the questions on the board as well):

- Do you think that this will happen?
- Are you sure that this will happen? Or are you sure that it will not happen? Or are you not sure whether it will happen or not?
- Why will it happen? Or why will it not happen?
- If you are not sure, then why are you not sure?

(These questions should remain on the board throughout the day's lesson, because the same questions will be asked in activity 2.)

Give one member of each group a turn to report back to the class. Ask these learners to give reasons for their answers, and write down the learners' answers *and* their reasons.
Learners will give responses like: "The water will definitely *not* freeze, because it is too hot", or "It cannot happen, because ice melts in the sun".

Write "*certain* that it will *not* happen" next to the statement on the board, and tell learners that we are certain (sure) that the dam water will *not* freeze on a hot sunny day.

Activity 2

Write the following statement on the board: "The sun will rise tomorrow morning".

Again let learners discuss this statement in small groups, considering the four questions that you already wrote on the board ("Do you think that this will happen?", etc.).

Give one member of each group (a different member from before) a turn to report back to the class. Ask these learners to give reasons for their answers, and write down the learners' answers *and* their reasons.

Some learners will give answers like “the sun always rises in the morning”. Other learners may give a response that tells us *why* the sun always rises, for example “the sun will rise again tomorrow because the earth will keep rotating around its axis”. But they all will agree that the sun always rises. (When there are clouds in the sky, the sun itself may not be visible, but it will still get light in the morning, which means that the sun has risen.)

Write “*certain* that it will happen” next to the statement on the board, and tell learners that we are certain (sure) that the sun will come up tomorrow morning.

WEEK 6: DAY 2

Notes to the teacher:
- This is a direct continuation of the work of day 1

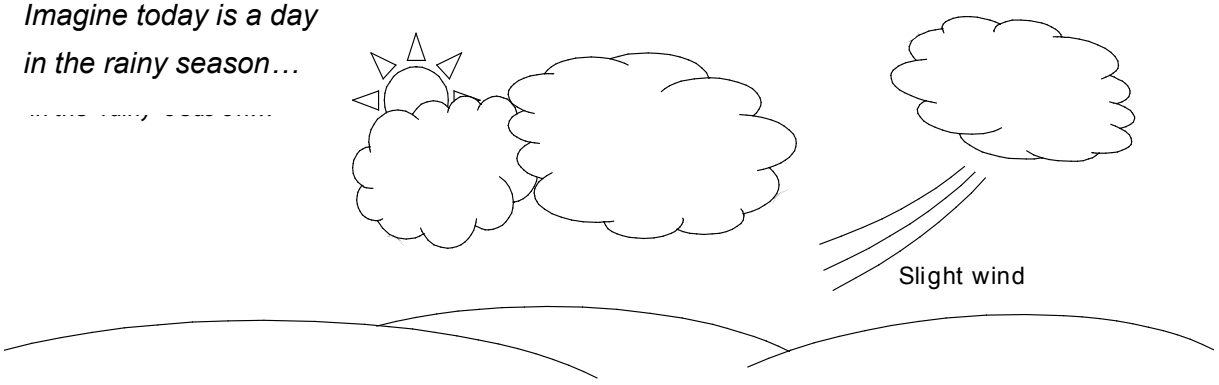
ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Write the following statement on the board: "*It will rain tomorrow*."

Imagine today is a day in the rainy season…



Ask learners to *imagine* that it is a day in the rainy season (summer in the interior of the country, winter in the Western Cape), that it is partly cloudy, and that there is a slight wind.
Redraw the picture on the previous page for the *imagined* weather of today.

Explain to the learners that they have to discuss the statement "It will rain tomorrow" whilst imagining the weather today was like the weather in the drawing.
Now let learners discuss this statement in groups of 3 to 4, while considering the following questions (write the questions on the board as well):

- Do you think that this will happen?
- Are you sure that this will happen? Or are you sure that it will not happen? Or are you not sure whether it will happen or not?
- Why will it happen? Or why will it not happen?
- If you are not sure, then why are you not sure?

Repeat to the learners that they have to think about the *imagined weather conditions* in the drawing when thinking about the statement. They should *not* think about the actual weather conditions where they are today.
Give one member of each group (a different member from before) a turn to report back to the class. Ask these learners to give reasons for their answers, and write down the learners' answers *and* their reasons.

Do not tell or show learners whether you agree with their answers or not, but rather show that you are very interested in them explaining the reasons for their answers to the class.
We do not want learners to worry about getting 'correct' answers in this activity. Rather, the purpose of this activity is for learners to become good at telling (and writing) reasons for their answers.

It is very important that the learners' responses are written in full sentences (and not merely words) on the board, because we want the class to reflect upon the different kinds of language that learners used to respond to the questions. The different kinds of language often indicate different kinds of thinking/reasoning.

Learners will give different answers. Some will be sure that it will rain; some will be sure that it will *not* rain. Some will say that it will rain, but they are not absolutely sure; others will say that it will *not* rain, but will also admit that they are not absolutely sure.
Learners will also give different *types of reasons* for their answers:

a) Some learners may say something like "it will rain tomorrow because it is summer and because there are many clouds in the sky today". Point out to the class that this type of reasoning/explanation tells you *why* (because of what) something will happen.
b) Other learners may say something like "it does not rain often, but sometimes it does rain, and I cannot be sure whether it will rain or not", or "it usually rains in summer, but I cannot be absolutely sure whether it will rain tomorrow". Point out to the class that this type of reasoning/explanation uses words like 'often', 'rarely', 'sometimes', 'almost never', 'usually', etc.. These words talk about *how often* something happens.
c) Other learners may say something that combines the *'why?'* type of explanation with the *'how often'* type of explanation. For example: "There are clouds in the sky, and when there are clouds in the sky, it usually rains. Therefore I think that it will rain tomorrow, but I am not completely sure." This explanation actually says two things. It tells you *why* it will rain ("there are clouds in the sky"). But it also tells you *how often* it rains in a situation like this ("usually", which means most of the time). Tell the learners in most of the situations in which one tries to predict something, one have to ask oneself both the *"why will it happen?"* question and the *"how often will it happen?"* question.

It is very important that learners give a '*why'* explanation or a *'how often'* explanation (or a combination of the two) for their answers. Without such an explanation, they are merely telling us their opinions, and we have no way of thinking about whether we agree with them or not. If everybody give answers like "It will definitely rain tomorrow, just believe me, I know", then the group discussion will become a 'word fight', with people shouting "Is so!" and "Is not!". If such a 'word fight' should happen in your class, then allow it to continue for a few minutes. Then stop the discussion, After such a 'word fight' the learners will appreciate that giving an answer without a reason (justification) is of no use. If we want to have a discussion where everybody can think and learn (and maybe even change their opinions because of new ideas), then we have to give reasons for our answers.

Close the discussion by pointing out people had different opinions on whether it will rain tomorrow or not, and that most people were not exactly sure of what will happen.
Write "*uncertain* that it will happen" next to the statement on the board,

WEEK 6: DAY 3

Notes to the teacher:

- Day 2 repeats the same type of content as days 1 and 2, but now learners have to work on their own and have to make explanatory sentences. So this activity is for the development of independent thinking and of language abilities.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Give learners a few statements (either written on the board or on a prepared sheet) that they have to consider. Learners have to work individually. For each statement, they have to give written responses to the statements. The following questions will guide them to write reasons for their opinions on the statements:

- Do you think that this will happen?
- Are you sure that this will happen? Or are you sure that it will not happen? Or are you not sure whether it will happen or not?
- Why will it happen? Or why will it not happen?
- If you are not sure, then why are you not sure?

A few examples of statements that learners have to consider are given below:

- The school bus will break tomorrow.
- It will rain soccer balls tomorrow.
- My uncle will win the Lotto tomorrow.
- Bafana Bafana will beat Brazil in their next match with them.
- The sun will go down at the end of today.
- The teacher will walk to school tomorrow morning.

When learners have completed the task (and you have checked that they have written down reasons for their opinions), let them discuss their responses in groups of 3 to 4. Ask learners to compare the *ways* in which different learners responded to the same statement, and to argue with each other about the differences between their responses. You should try to listen to some of the arguments in the small groups and make notes of the differences.

At the end of the lesson, ask learners if they think that some statements are *more uncertain,* and other statements are *less uncertain*. Ask them each to write a small paragraph about this question, for homework. (Do not discuss an answer to this question in class – just ask the question. The question will be answered in the following activity.)

WEEK 6: DAY 4

Notes to the teacher:

- Learners play a game of chance by tossing a coin. They play the game many times. Then they count how many times different outcomes occurred. The game has been designed so that all possible outcomes do not have the same chance of occurring, so some will occur more often than others.
- The purpose of this activity is for learners to discover that the question "What is the chance (or how certain are you) that a particular outcome will occur?" is actually the same as the question "How often will the outcome occur in a large number of games?".

Resources:

- 5c coins

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Tell learners they will play a game by tossing a coin. They will work in groups of 3 to 4.
Hand out the coins and let the learners look at them. Ask them what they see on each side. Tell them that the side with the animal/bird on will be called 'heads' and the other side with the South African Coat of Arms will be called 'tails'.

Explain to the learners that the game works like this:
You toss a coin 4 times. Heads mean "1" and tails mean "0".
Then you calculate the sum of the 4 coin tosses (0, 1, 2, 3, or 4). This is called the 'outcome'.
But before you toss the coin 4 times, you have to predict the outcome. Then only you will toss the coin. If the outcome that you predicted occurs, then you win.

Let them work in groups of 3 to 4 and play the game for 5 to 10 minutes (no more than 10 minutes!).

Stop the learners, and explain to them they you wish to learn more about *how this game behaves*. Explain to them, that for the purpose of making a correct prediction more often, it will help you to know if some outcomes have a better chance of occurring than others.
Tell them that they will now *investigate the behaviour of the game* (do an *experiment*). They will *not* try to make predictions to try to win anymore. Instead, they will try to learn more about the game by playing the game many times, and writing down all the outcomes. Whatever outcomes they get, they must write all of these outcomes down. Even if they feel that is certain outcome is 'bad', or 'special', they should still write it down. The purpose of the experiment is to learn about the game, and therefore the experiment should not be influenced by what they think is 'good' or 'normal'.

Ask them (in their small groups) to play the game 10 times, to investigate if some outcomes happen more often than others.

When they are finished, they must make table of how often different outcomes occurred. Each learner should make the table himself/herself, even though they gathered the data together in small groups. The table will look like the following (the tallies are for example purposes only):

Outcome	0	1	2	3	4	**Total**
Tally (how many times)	1	3	4	2	0	**10**

When they are finished, you should collect the data from all the groups and combine it into one table one the board. Explain to the learners how you are combining all the data. If there are 12 groups in the class, then there will be 12×10=120 games that were played in total. The table will look like the following (the tallies are for example purposes only):

Outcome	0	1	2	3	4	**Total**
Tally (how many times)	5	33	47	26	9	**120**

When you have finished, ask learners again if they think that some statements are *more uncertain,* and other statements are *less uncertain* (the question you gave them at the end of the previous day for homework).
Ask them to work in their small groups to arrange the different outcomes (0, 1, 2, 3, and 4) from the *most uncertain* to the *least uncertain*. (If they think that some outcome is *equally uncertain* to some other outcome, they must say so.)
Ask learners what outcome they will bet on, if they want to win the game as often as possible.

Now let learners work individually. Ask them to make sentences of their one to answer the question “How often did different outcomes occur in a large number of games?” You want to give them as little instruction as possible, so that they make the sentences by their own initiative. After they did this, you may write these sentences on the board, e.g. “The outcome “0” occurred in 5 out of 120 games”.

Finally, ask learners to discuss in their small groups whether there is a difference between the question “*How certain* are you to get an outcome of “3” in the game?” and “*How often* do you think you will get an outcome of “3” in a very large number of games.

WEEK 6: DAY 5

Notes to the teacher:

- The questions are intended to make learners realize that certain predictions will more often be right than others.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Write the following four statements on the board.

Your aunt is pregnant. Susan says she will get a boy child.

Your aunt is pregnant. Felicity says she will get a girl child.

Your aunt is pregnant. Ben says she she will get twins.

Your aunt is pregnant. Temba says will get triplets.

Say to them:

The four friends Susan, Felicity, Ben and Temba always say the same when some woman they know is pregnant.

Ask the learners to reflect on the following question individually, and then let them discuss it in small groups:

Who do you think will most often be right, and who will least often be right?

Activity 2

Write the following statements on the board. Ask learners to arrange them, by just writing the numbers (letters), from what they are most confident will happen, to what they are least confident will happen. Each learner should do this individually. Then they should compare their lists in small groups of no more than four learners.

A. A certain boy, Thabang, will have an upset stomach tomorrow.

B. A ceratin girl, Sinah, will have a cold tomorrow.

C. A certain boy, Jeremy, will break his arm tomorrow.

Ask learners to write a paragraph to explain *how often* Thanbang will have an upset stomach, *how often* Sinah will have a cold, and *how often* Jeremny will break his arm.

SECOND TERM: WEEK 7 OVERVIEW

Hours: 5					**Number of Periods: 5**
Learning Outcomes and Assessment Standards **LO4** AS 5;6;7 **Integration: LO1** AS 1;3;5;6;7;8;9;10;11 **LO5** AS 2;3			**Milestones:** • Uses the appropriate SI unit to estimate, measure, record and compare mass (grams and kilograms). • Solves problems involving selecting, calculating with a calculator and converting between appropriate SI units (grams ⇔ kilograms). • Uses appropriate measuring instruments to attain valid levels of precision including: bathroom scale, kitchen scale and balances to measure mass.		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Compare the mass of different objects. Order the masses from lightest to heaviest along a line. Interpret a drawing of a balance scale to solve a mass problem that requires proportional thinking.	Get a feel of the mass of one kilogram. Compare the mass of different objects of one kg. Sort and record data in a table. Discuss and compare findings. Solve problems with balance scales. Add on to the lighter mass so that both sides have the same mass.	Work in groups. Order packets of different goods weighed in kg and g amounts. Organise data in a table. Summarise group's results in one table. First estimate, then use calculators to find how many small packets of goods make up a kg or more.	Take mass readings on a bathroom scale. Write mass measurements in kg/g and as decimals. Work in groups to estimate and weigh body masses, round off to the nearest kg and ½ kg. Solve problems working with kg and g.	Use number skills to solve rate problems. Compare and calculate the cost of the same goods packaged in different ways, per kilogram. Estimate and calculate which is the better buy.
Resources	Real examples or pictures of different kinds of scales such as a bathroom scale, a balance scale or a simple spring scale. Photocopies of worksheets or problems written up on blackboard.	Transparent containers filled with small counters, bags of materials, e.g. beans, weighed out in kg amounts. Goods packed in kg and g amounts. Worksheets or examples on the board for learners to copy.	Empty packaging like boxes and tins that hold goods weighed in kilogram and gram amounts for each group. Calculators for each group to work with.	Copies of prepared worksheets and answers sheets or similar examples with the same focus taken from learners' textbooks.	Worksheets or work cards complied from advertising fliers, newspaper ads with examples of the same kinds of goods packaged in different quantities.

WEEK 7: DAY 1 Introducing Mass

Notes to the teacher:
In everyday life we talk about weight and mass as the same thing. But in reality they are different. Weight is a force that we measure in newtons. Newtons measure the gravitational pull that the earth exerts on an object. When we jump off a ledge, for example, we are pulled towards the earth by gravity. If we stand on the ledge, the force we exert on the ledge is our weight. On the moon we weigh less than on earth because the moon's gravitational pull is less than the earth's gravitational pull. Mass on the other hand is measured in kilograms in grams and other units in between. Mass measures the amount of material in an object which stays the same, whether we are on the earth or on the moon.
Many books refer to mass and weight interchangeably, but correctly speaking, when we ask the question "How much does an object, a person or an animal weigh?" we are referring to their mass, not their weight. **While it is unnecessary to go into these details with Grade 4 learners**, it is important to use the right terminology now so that later on, they don't confuse mass with weight in scientific contexts and applications.

Resources:
Bring different kinds of scales to class, for example: a plastic balance scale; a kitchen scale that come in most standard maths kits; a bathroom scale; or a simple spring scale.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

- Go over conversions of units of length that learners have done in Term 1. Write the following examples on the board. Give learners turns to come up to the front and fill in the answers.
  1m = _____ mm 1 km = _____ m

  $\frac{1}{4}$ m = _____ mm $\frac{1}{2}$ km = _____ m

  Now ask learners if they remember another way to write half a metre in decimals. Can they also write a quarter or a tenth of a metre in decimals?

- Write the following examples on the board and give learners turns once more to fill in the answers. Ask them to explain their answers to the rest of the class.

  4 km = _____ m 2,5 m = _____ cm

  2,5 km = _____ m 1 500 mm = _____ m

CONCEPT DEVELOPMENT (25 minutes)

What is mass?

- Ask learners to explain what we mean when we say something is heavy or light. In as simple a way as possible, tell them that when we weigh an object we find out its mass which means the amount of material in that object.
- Hold up five or six objects in turn, all of different masses, for example: a black board duster, a metal or wooden blackboard instrument, a book, a piece of chalk.
- Ask learners to put them in order from light to heavy or heavy to light.
- Invite one learner come up to the front and hold two of the objects; one in one hand and one in the other to feel and compare their masses.

- Talk about what happens when you hold two objects of different masses and two objects of more or less the same mass in your hands.

Ordering and comparing masses

- Next ask learners to look around the classroom and decide what the heaviest and the lightest (moveable) objects are that they can see. They will offer different suggestions. Help them to agree on two objects, one heavy and one light.
- Draw a line across the board and write the names of the two objects at either end like this.
- Explain that the line is like a scale on which you can list the names of the objects from lightest to heaviest; in this example from the pair of glasses to the table.

Glasses _____ **Table**

- Each learner now copies the line in their books. Use the objects they choose, rather than these examples. They must now look for six other objects with masses in between these two and write in the names in order of their (estimated) mass. They should land up with a line that lists all 8 objects in order like this:

_____. _____. _____. _____ ._____. _____. _____ . ___

glasses duster metre stick soccer ball dictionary school bag chair table

- Make time for learners in their groups to discuss and evaluate each other's examples.

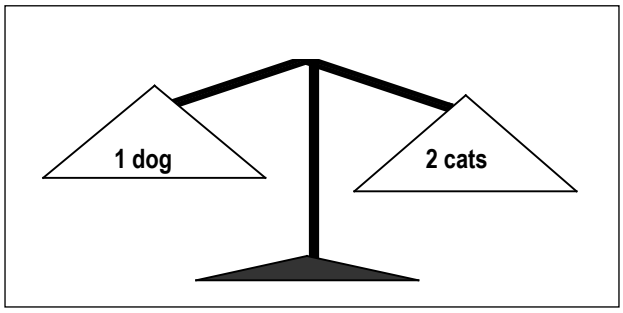
Introducing scales (10 minutes)

- Try to get hold of real examples of different kinds of scales for this activity. If you can't, look out for some good pictures of these. Discuss and compare the ways the different scales work, how we take mass readings from them, and which ones we use for which purposes. Examples can include a spring balance scale, which we use to weigh items we suspend, like a bag; a balance scale with two pans which we use to measure and compare two masses; a kitchen scale with only one pan; a bathroom scale or clinic scale that we use to measure body mass.

- Use the plastic balance scale from a school maths kit or you make your own from a wire hanger. Weigh different objects to show learners what happens when the mass on one side is heavier or lighter than the other side and what happens when the two masses are equal.
- Invite different learners to come up to the front and choose two objects or group of objects to weigh that they estimate have the same mass.
- They must keep trying until they get the scale to balance. The rest of the class can give suggestions of which objects to try. Do this four or five times.

PROBLEM SOLVING (15 minutes)

This activity links mass with proportion. Draw a picture of a balance scale like this on the board. Ask learners if they can interpret the picture, i.e. one dog weighs the same as 2 cats.



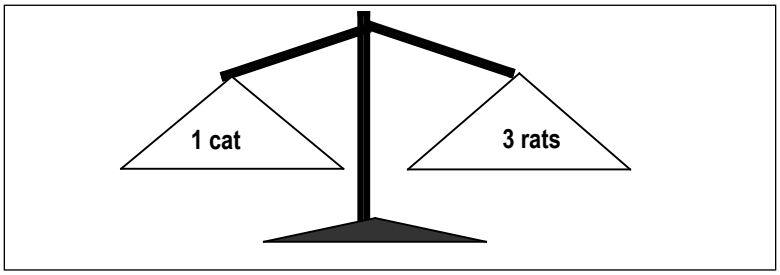
Ask questions like:

"How many dogs weigh the same as 4 cats?" or

"How many cats weigh the same 3 dogs?"

Reason through the solutions together.

- Next draw another scale to show 1 cat weighs the same as 3 rats.



- Learners now use the information from both scales to answer the next questions. They can work alone, in pairs or in small groups. Read the questions aloud for them if necessary.
- The italics to the left of the question explain the answers, but not necessarily the thinking or strategies learners will use to find the answers. For example they may use doubling or repeated addition, rather than multiplication.

  Questions

  a) 2 cats weigh the same as____ rats? *Multiply 2 x 3 = 6 rats*

  b) 12 rats weigh the same as ____ cats? *Multiply 3 x 4 to get 12 rats; Multiply 1 x 4 to get 4 cats.*

  c) 1 dog weighs the same as ___ rats? *If 1 dog weighs the same as 2 cats, and 1 cat weighs the same as 3 rats, then 1 dog weighs the same as 2 x 3 rats = 6).*

- Discuss answers together and the different strategies learners may have used.

Assessment	**Formal:** None **Informal:** Assess learners while working through the different tasks. Ask yourself questions like: Do they understand the tasks and the instructions? Have they the necessary thinking and calculation skills to answer all the questions? What kinds of activities can you do to help learners who can't keep pace with the rest of the class?

WEEK 7: DAY 2 How much is a kilogram?

Notes to the teacher:
Today we introduce learners to the kilogram as the standard unit of mass we commonly use. They estimate and compare the masses of different objects in relation to amounts weighed in kilograms. They experience how much a kilogram "feels" in their hands, to develop a sense of its real mass.

Resources:
- For the oral and mental activity, prepare one bottle or plastic see-through containers filled with small counters or beans for each group.
- For the main activity prepare bags of weighed materials, e.g. beans or pebbles that weigh exactly 1 kg. Use a scale to measure accurately.
- Also collect a variety of goods that come in marked in kg amounts, up to 2 kg. Include amounts that weigh 250 g; 750 g and 500 g. Use paper and sticky tape or a label to hide the information that gives the mass of each item. Make labels with these amounts written on to use later on.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

- Learners work in groups. Give one bottle filled with counters or beans to each group. The group members must decide together on the best estimate of how many objects are in the bottle. They write down their estimate and then count out the objects and compare the two numbers. Each group reports back on their findings. The group whose estimate is closest to the actual number is the winner.

CONCEPT DEVELOPMENT (30 minutes)

Learners continue to work in groups for the next activity.

- Give each group a bag of materials that you have measured out, each weighing exactly a kg.
- Tell them how much the bags weigh. Explain that just as we use a metre or kilometre to measure length, we use kilograms and grams to measure mass, to find out how much things weigh. Explain that a kilogram is made up of smaller units called grams which we use to weigh and name smaller masses.
- Write the conversion 1 kg = 1 000 g on the board. Relate this back to what learners know about length where 1 km = 1 000 m or 1 m = 1 000 mm.

Introducing kilograms

- Give out one of the kg bags you prepared beforehand to each group. All the learners in the group should have a chance to hold the bag in their hands to get a sense of how much one kilogram "feels" in their hands.
- Ask two learners at a time to come up to the front with their kg bag from their group. One learner chooses one of the unmarked packets/bags of goods on your table, holds it in one hand and their kg bag in the other and says if they think it weighs more or less than their kg bag. Ask questions that encourage learners to use language like: *half as much, less than half, a bit more or less than half, twice or double as much, under or over.* The second learner checks to see if he/she agrees with the other learner and together they estimate what the actual mass of the item is; in kilograms or grams. The rest of the learners can make inputs.

- Once they've done this ask them if they can estimate in grams or kilograms how much they think the second object weighs. Write a few of their estimates on the board. Then produce the label that shows the actual amount and compare this with learners' estimates. Attach the label to the item. Continue in this way until learners have estimated the masses of all the goods on your table and you've labelled them with the correct mass amounts.

Group activity

- Working together in their groups, learners now look for three or four objects around the classroom they think weigh about a kilogram, about 2 kg and about 5 kg. They can use their kg bags as a measure to compare and evaluate the masses of the objects they choose. They record their results in a table which they copy from the board.

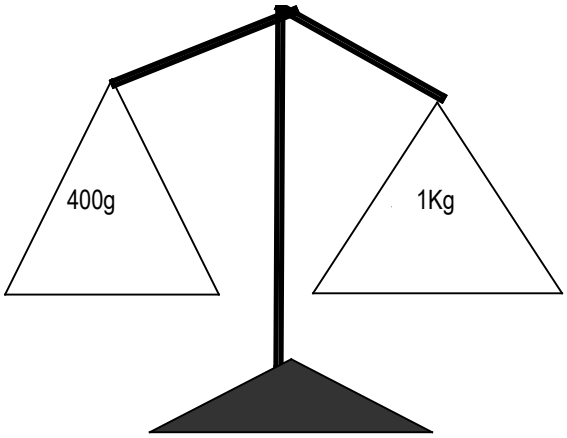
- Draw a table like this on the board without the examples filled in. Explain what learners must do and what they need to write in the table. Give out one large sheet of paper for each group to make a copy of the table.

About a kg	**About 2 kg**	**About 5 kg**
5 textbooks	*Box of paints*	*School bag*

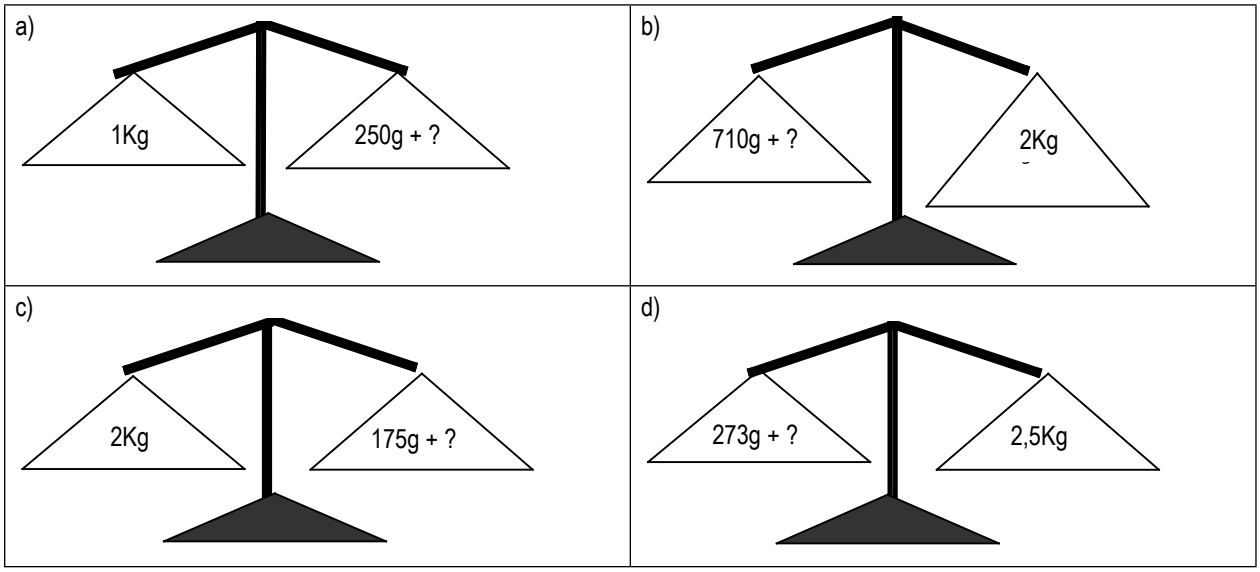
- Learners work in groups. Some can look for the objects and others can help draw the table. Move around the groups to give support and offer suggestions. When the groups are finished make time for feedback when each group tells the rest of the class about the objects they chose.

PROBLEM SOLVING (15 minutes)

- Draw a balance scale like this on the board. Explain to learners that they must work out how much they need to add to the smaller mass to make the masses the same and the scale balance. *(In this example they must add 600 g to 400g.)*



- Make a prepared worksheet with more of the same kind of examples or draw them on the board. The ones below are just suggestions. Include graded examples from easy to difficult. Keep the range between 0 – 3000 for now (3 kg). For example a) below is easier than d).



- As learners work, move around the class to observe how they work. This will give you a chance to review and assess different learners' calculation methods and skills. Think about further practice activities you can do in your number lessons where learners build up from 3-digits numbers to whole 1 000s.

CONSOLIDATION (5 minutes)

- End the lesson by reminding learners how we measure mass using two main units: kilograms and grams. Ask them do some research on their own of different products they use at home that come in gram and kilogram amounts. They should try and bring examples of used packaging, weighed in kg and g, to school with them the next day.

ASSESSMENT	**Informal:** Estimation skills of number and mass (in relation to a kg unit) Calculations skills: Adding on from 3-digit numbers to whole 1000s (context of mass)

WEEK 7: DAY 3

Notes to the teacher:
Learners order packaging or containers with different mass amounts from lightest to heaviest. They record their findings in a table. They then estimate and calculate how many of the smaller items they would need to make a kg or more.

Resources:
- Empty packing including boxes and tins weighing anything from 1 to 2 kg.
- Enough calculators for learners to work with in pairs or small groups.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

- Write a series of numbers and measurements on the board that learners must copy and re-write in order from biggest to smallest/ smallest to biggest. Include both numbers and mass measurements, for example:

  From biggest to smallest:
  1 321; 1 098; 2001; 999; 1019
  4m 35 cm; 3 m 99 cm; 4m 15cm; 6 m 45 cm
  1,5 kg; 2,25kg; 3 kg; 2 5 kg; 4 kg

  From smallest to biggest:
  1 768; 1867; 2 100; 1 999; 2009
  3,5 kg ; 3 kg; 4k g; 3,25 kg; 4,25 kg; 5 kg; 6,25 kg; 6 kg
  1 kg 300 g; 1 kg 101 g; 2 kg; 2 kg 156 g; 3 kg 101 g

Review and discuss answers together.

CONCEPT DEVELOPMENT (25 minutes)

- Copy the table below onto the board. Leave space for at least 10 rows. Learners work in the same groups they worked in on the previous day.
- Share out the examples of the different packaging you've collected. Use additional items that learners may have brought. Make sure that each group has a variety of different masses to investigate.
- Working together in their groups learners first sort, then order their examples from least (mass) to most. Each learner should draw their own tables as shown below:

Mass amount	Item
E.g. 250 g	*Sugar*

- As learners work, move around from group to group to make sure they know what to do and that they know how to record the information correctly in their tables.

- When they are finished let each group report back on their findings. Write down the names of the products and the mass amounts on the board next to the table you drew.
- Ask learners to identify 10 products from the list and rank them in order from lightest to heaviest.
  Write this information in your table. Add two columns to the table with these headings.

Mass		**About how many make a kilogram?**	
		Estimate	**Calculate**
65 g	Salt		
75 g	Pretzel sticks		
125 g	Custard powder		

PROBLEM SOLVING (20 minutes)

Explain the next step of the activity. You can either use the products that learners list or the examples we have given above.

- Learners work alone or in pairs. They must first estimate and then use their calculators to find out how many packets of the small amounts make up one kg or just over a kg.
- If the amount falls short of a kg they must add one extra item in to reach the target of a kg or more. So using the first item in this table, for example, some learners may estimate that it will take 15 x 65 g packets of salt to make a 1 000 grams (1 kg).
- They then use their calculators to check their estimations to find that 15 x 65 g is only 975 g. So they have to add in another packet of 65 g to reach the target. (16 x 56 g = 1 040g)

Move around the class to observe how different learners work. In the case of amounts like 250 or 500 grams, it should be easy for them to find the answers quickly (4 lots of 250 g make one kg).

CONSOLIDATION (5 minutes)

Summarise the key concepts covered in the day's activities:

- Learners investigated examples of different goods weighing between 1 and 2 kg.
- They ordered these masses from lightest to heaviest using tables.
- They then found the 10 lightest items and estimated, then calculated how many of these it takes to reach a target of one kg or more.
- They practised using their calculators as a checking tool.

ASSESSMENT	**Informal:** Ordering 4-digit numbers; ordering mass amounts in grams and kilograms; estimating using multiplicative reasoning; using the calculator as a checking tool.

WEEK 7 : DAY 4

Notes to the teacher:
In today's activity learners begin by doing some quick word problems related to mass. In the main activity they learn how a bathroom scale works and how to take readings in kg and 0,5 kg amounts. They estimate their own body masses and then weigh themselves. They get further practice organising and presenting their information in tables.

Resources:
One or more bathroom scales

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

Give learners problems quick problems like these to solve:

a) Thabo's Dad weighs 68 kg. Thabo weighs half as much as he does. How much does Thabo weigh?
b) What is the combined mass of these three dogs? 45 kg; 40 kg and 25 kg
c) Gina weighs 26 kg. Her big sister weighs twice as much. How much does her big sister weigh?
d) Buti uses 450 g of mealie meal from a 1 kg packet. How much is left in the packet?

Review the answers together. Give some learners the chance to explain their thinking and the calculation strategies they used to find their answers.

CONCEPT DEVELOPMENT (30 minutes)

- Explain that in today's activity learners will have a chance to estimate and check their own masses using a bathroom scale.
- If possible get the class to gather round you so that they can all see the scale. Stand on the scale or ask for a volunteer to do so while some of the other learners take a reading. Help them decide if the amount should be rounded up or down if it falls between two kg marks. Learners can then return to their desks.

- Draw a linear representation of the scale markings across the length of the board as follows:

0kg I I I I I I I I I 5kg I I I I I I I I I 10kg

- Give learners a chance to study the line and then to say what measurements the long and shorter lines in between stand for. Some may say half kilograms, others may say "comma five". Now ask learners to count on in two ways using fractions and decimals from 0 -10.
- As they do, write in the numbers underneath the markings as follows:

0 kg I I I I I I I I I 5 kg I I I I I I I I I 10 kg

0 ½ 1 1 ½ 2 2 ½ 3 3 ½ 4 4 ½ 5 5 ½ 6 6 ½ 7 7 ½ 8 8 ½ 9 9 ½ 10

0 0,5 1 1,5 2 2,5 3 3,5 4 4,5 5 5,5 6 6,5 7 7,5 8 8,5 9 9,5 10

Use your ruler or your metre stick to point to any numbers and ask learners to count forwards or backwards in half kg intervals (in both fractions and decimals).

- **Weighing ourselves**
  Note: If for any reason there are learners who do not want to or cannot participate in this activity, do not make an issue about this. Find anther practical mass activity for them to do where they practise estimating and weighing different objects on other kind of scales you have available.

- Working in their groups, learners now estimate and then weigh themselves on the bathroom scale. Each group must make a table to record the estimates and the mass of each group member as shown below. Give each group an A3 sized sheet of paper to record the group's findings.

Names	**We estimate**	**We weigh**	**Difference**

- Before they begin, refer to the drawing on the board, remind learners how to round off to the nearest half kg (if a reading falls between 0,5 kg marks). If it falls closer to the 0,5 mark they round up to half a kilogram. If it falls closer to the lower kg mark than the half kg mark, they round down to the lower kilogram. Do one or two examples together.
- Take the scale from group to group. Group members must decide together on a reasonable estimate for the mass of the group member whose turn it is. They then check their estimate against the actual reading and calculate the difference between the two. Their completed tables will have a list of all the group members details as follows:

Names	**Estimated mass**	**Actual mass**	**Difference**
Thabang	*50 kg*	*45,5 kg*	*4,5 kg*
Lisa	*48 kg*	*51,5 kg*	*3,5 kg*

- If you have only one scale to work with, you can let the other groups begin working on the problem solving examples below. Find similar kind of examples in learners' textbooks if you prefer. Learners should, where possible, work through these on their own.
- Use this as an opportunity to formally assess and record learners' knowledge and ways of working with both number and mass (see guidelines below).
- Think about ways to both remediate and extend learners, depending on their needs and abilities.

Problem solving (20 minutes)

a) How many 500 g packets of flour weigh the same as 2,5 kg of flour?
b) Jane weighs 56 kg. Her baby sister weighs half as much. How much does her sister weigh?
c) In the shop you can buy mealie meal in 1 kg packets, 500 g, 250 g and 125 g packets. Jabu wants to buy 5 kg of mealie meal for a family dinner. Write down all the possible combinations of packets of mealie meal he can buy.
d) Mrs Dlamini needs 1,5 kg of rice to cater for a function. She only has a small packet of 250 g in her cupboard. How much more rice does she need?
e) A lift can take a load of up to 250 kg. The group of people below want to get into the lift. Only three people at a time can get into the lift. Find two possible ways of combining these people so that they can all get to their destination in two journeys.

Buthi: 100 kg; **Maru**: 85 kg; **Ben**: 72,5 kg; **Neo**: 71 kg; **Jannie**:90 kg; **Ahmed**: 69,5 kg

- Review answers and calculations strategies together. If learners have not completed the examples, they can complete these for homework and do the review the following day.

ASSESSMENT	**Informal:** Focus on learners' precision in estimating their body masses, how they work together in a group. **Formal:** Use the last activity to assess and record on an observation sheet, or similar tool, how different learners work to solve problems. Ask yourself questions like: • Can learners work independently to read and interpret the problems? • What calculation strategies do they use? • Do they show evidence of doing any mental calculations? • How do they show their calculations and their solutions in writing?

WEEK 7 : DAY 5

Notes to the teacher:
In today's activities learners work with rate. This involves comparing two quantities; in this case cost (in rands) and mass (kg and g). They use this information to calculate and compare which is the best buy for the same item that you packaged in different quantities. For example: is it cheaper to buy 1 kg bag of sugar @ R12.99 a kg or a 2 kg bag @ R27 a bag? Do some of your own research on current prices of household brands that you can buy in different quantities. You can find plenty of these in newspapers or advertising fliers. Make sure the prices are current and not outdated. Choose basic items that most households need, rather than luxury items some learners will not likely be able to afford.

Resources:
- The same examples of packaged products you used previously.
- Calculators.
- Textbook examples or advertising fliers with current prices that show the same kinds of goods packaged in different mass amounts.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

Hold up some of the products that learners worked with previously .Ask them to estimate their cost. Write four of five suggestions on the board. Then tell them the real price. (*If you do not know the exact price, make sure to give them a close estimate.)* Commend learners whose estimates are closest to the real amount. Do this for several products. Notice which learners take wild guesses and which give more informed responses.

CONCEPT DEVELOPMENT (25 minutes)

- You can either cut and paste the examples we provide to make up worksheets or work cards for learners to work with, or make up your own worksheets based on the research you did.
- Make master copies of these so that you can use them for as long as the prices remain more or less current.

	Washing Powder	**Cost per kg**	**Estimate**	**Calculate**
250 g	7.90	4 x R7.90	4 x R8 = R32	R31.60
500 g	14.90			
1 kg	18.90			
2 kg	38.90			

- Begin by asking learners to explain what they think "cost per kg" means. How would they calculate this? Take them through the first example together to find out what 4 packets of 250 g of washing powder will cost (giving a cost per kg).
- Discuss how the amount of R7.90 has been rounded off to R8. They should do the same for the other amounts. They can use calculators to find the actual cost and then compare these with their estimates. Their completed table should show these figures.

	Washing Powder	Cost per kg	Estimate	Calculate
250 g	R 6.90	4 x R6. 90	4 x R7 = R28	R27.60
500 g	R 14.90	2 x R14.90	2 x R15 =R30	R29.80
1 kg	R 18.90	1 x R18. 90	R18. 90	R18.90
2 kg	R 38.90	$\frac{1}{2}$ of R38.90	$\frac{1}{2}$ of R40 =R20	R19.45

- When they have done this correctly, ask questions like:
- Which is the most expensive way to buy 1 kg of washing powder? (2 x 500g packets)
- Which is the cheapest way? (to buy a 1 kg packet)
- If you need to by 2 kg of washing powder what packets will you buy? (2 x 1 kg packets)
- If you need to buy 5 kg of washing powder which packets will you buy? (5 x 1 kg packets)
- If you need buy 500 g, but did not want to break up the kg packet? (2 x 250 g packets)

PROBLEM SOLVING (15 minutes)

- Here is one example of a problem situation for learners to do, based on the same concept. You may look for similar examples in learners' textbooks or make up your own. Learners should not use calculators but work out the amounts themselves. They can use the calculator afterwards to check their calculations.

Example

a) Mrs Dladla is preparing curry and rice for a school function. She needs 9 kg of rice. How must she buy the rice so that she spends as little as possible?

R212.60 10 kg	R131.00 5 kg	R40.70 2 kg	R18.70 1 kg

b) For another function, Mrs Dladla has to use 13 kg of rice. How should she buy the rice this time?

Discuss and review answers together.

Assessment Activity

- Give learners a follow up example to use as a formal written assessment activity to review if learners have understood and can do these calculations on their own. Here they should not use calculators, but do the calculations themselves. To estimate they can round the amounts to the nearest whole rand amount or to the nearest 50c.

Cost of Peanut Butter			
Peanut butter	**Cost per kg**	**Estimate**	**Calculate**
250 g	R6.10		
500 g	R11.49		
2 kg	R50.70		
1,5 kg	R35.80		

Questions to ask:

- Is it cheaper to buy 2 x 250g bottles or one 500 g bottle? (1 x 500 g bottle)
- Is it cheaper to buy 2 x 500g bottles or 1 x 1 kg bottle? (2 x 500g bottles)
- Compare the difference in cost if you were to buy 3 kg of peanut butter by buying 1 x kg bottle and 2 x kg bottles versus buying 3 x 1 kg bottles. (R74.60 - R73.20 = R1.40)
- Compare the cost of buying 4 x 250 g bottles and 1 x 1 kg bottle. (Both ways will cost R24.40.)

CONSOLIDATION (10 minutes)

- Sum up the day's activities by talking about the concept of "value-for-money". Ask questions that get learners to think about issues like:

a) Is bulk buying always the cheapest?
b) Why do stores sometimes sell smaller amounts for less money than larger amounts?
c) What maths skills and knowledge do they need to use to work out which is the cheaper buy?
d) What are some of the other advantages to buying things in bulk?

- Encourage learners to use what they have learned when they go shopping with their families to buy food and other products and to calculate which is the better buy.
- Tell them to look out for the way in which big supermarkets give information on some goods, especially those that come in many different brands and packaging: according to price per kilogram or price per 100g as the case may be. They can find this information pasted to the shelf above the items.

ASSESSMENT	**Formal:** Use the last activity for formal assessment purposes. The activity tests several skills that you can asses at the same time, for example if they can work independently to: • interpret information given in tables; • estimate by rounding off; • do rate calculations to find the cost per kg for different amounts; • calculate with rands and cents (dividing and multiplying); • present and record information in a table.

SECOND TERM: WEEK 8 OVERVIEW

Hours: 2					**Number of Periods: 2**
Learning Outcomes and Assessment Standards **LO4** AS 5;6 and 7 **Integration: LO1** AS 1;3;5;6;7;8;9;10;11			**Milestones:** • Uses the appropriate SI unit to estimate, measure, record and compare mass (grams and kilograms). • Solves problems involving selecting, calculating with a calculator and converting between appropriate SI units (grams kilograms). • Uses appropriate measuring instruments to attain valid levels of precision including: bathroom scale, kitchen scale and balances to measure mass. • Investigate and extend numeric (to at least 2 000) and geometric patterns looking for general rules or a relationship, including patterns of learner's own creation.		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Convert units of mass in order to add together measurements given in different ways. Round off grams and fractions of a kg to the nearest kg.	Written Assessment Task based on all work done on mass so far.	Learners make and analyse number patterns, where there is no constant difference or ratio between successive terms.	Learners make and analyse number patterns, where there is a constant difference between successive terms.	. Learners make and analyse number patterns, where there is a constant difference between successive terms
Resources	Copies of practice activities or similar examples found in textbooks and other resources.	Copy of prepared Assessment Task or similar task with items to test learners' understanding of the work covered on mass.			

WEEK 8: Day 1

Notes to the teacher:
Today's activities give learners practice converting fractions of a kg to grams. From here, they do calculations where they add amounts given in mixed measurements by converting to grams and, in some instances, converting back to kg. In the second set of activities, they work out a rule for rounding off gram amounts and amounts expressed as fractions of a kg to the nearest kg. They do some practice activities applying what they've learned. Learners also get practice using calculators to compare their estimations with actual amounts and do further conversions of grams to kg.

Resources:
Graded examples for learners to practise adding and subtracting in kilograms and grams and doing conversions between the units. We provide some examples but you are free to change these or add your own. Copy these onto work cards with matching answer cards for each set of questions.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL WORK (10 minutes)

Write these conversions on the board in the same way, one underneath each other with some of the given amounts filled in.

1 kg = 1 000 g
$\frac{1}{2}$ kg = 500 g
$\frac{1}{4}$ kg = ____ g
$\frac{1}{8}$ kg = ____ g
$\frac{1}{10}$ kg = 100 g
$\frac{1}{5}$ kg = ____ g
$\frac{1}{20}$ kg = ____ g

Ask learners to find the missing gram amounts. If they answer correctly have them explain to the rest of the class how they worked out the answer. Afterwards, discuss different ways that they might have used to work these out if they did not know them already, for example:

- they first need to change kg to 1 000 g;
- they may know that $\frac{1}{5}$ of 1 000 g means 1 000g "cut up " into 5 equal parts. In this case they can divide 1 000 g by 5 or use less formal ways to break up 1 000 into five equal parts.

• Talk about another way they could think through the answers by looking for a relationship between the fractions, for example:

- $\frac{1}{4}$ kg is $\frac{1}{2}$ of $\frac{1}{2}$ a kg, so $\frac{1}{4}$ kg must be half of 500 g which is 250 g
- $\frac{1}{8}$ kg is half of $\frac{1}{4}$ kg so this is 125 kg
- $\frac{1}{10}$ of a kg is 100g, so $\frac{1}{5}$ kg must be twice this amount which is 200 g
- $\frac{1}{20}$ kg is half of $\frac{1}{10}$ kg so this is 50 g

• Before beginning with the main lesson's activities, give learners practice examples doing quick conversions like these:

1,5 kg = _____ g 2 kg = _____ g $\frac{1}{4}$ kg = _____ g 1 $\frac{1}{4}$ kg = _____ g
500 g = _____ kg
2 500 g = _____ kg 3 $\frac{1}{10}$ kg = _____ g 2 $\frac{1}{5}$ kg = _____ g

CONCEPT DEVELOPMENT (25 minutes)

- Here learners practice adding and subtracting in kilograms and gram amounts and converting units of mass. Note these exercises are not about using formal methods (algorithms) for adding or subtracting fractions but converting fractions of a kg into grams before adding the amounts together.
- Divide the learners into ability groups for this task. Give each group graded work cards to answer as follows: 1 is the weaker group; 2 is the middle group; 3 is the strong group.
- As learners work, move around the class and spend time with those groups of learners who need more help more than others.
- Make sure that all groups are kept busy for the assigned time. Let them swap cards if they finish quickly. Give out the answer cards so that they can check and correct their own work. This will free you to spend time working with the weaker groups.

Sample work cards

Group 1 (a)	**Group 1 (b)**
a) 1 kg + 2 kg + $\frac{1}{2}$ kg + $1\frac{1}{2}$ kg = _____ kg b) $\frac{1}{2}$ kg + 200 g + 140 g = _____ g c) 105 g+ _____ g = $\frac{1}{4}$ kg d) 920 g + _____ g = $1\frac{1}{2}$ kg e) 15 kg + 70 kg + $\frac{1}{10}$ kg = _____ kg	**Group 1** a) 500 g + 2 $\frac{1}{2}$ kg = ____kg b) 5 kg – $1\frac{1}{2}$ kg = _____ kg c) 350 g + $\frac{1}{2}$ kg +_____ g = 1 kg d) 8 kg – 2 $\frac{1}{4}$ kg + $\frac{1}{2}$ kg = ____ kg e) $\frac{1}{10}$ kg + _____ g = 2 kg

Group 2 (a)	**Group 2 (b)**
a) 1 kg - ____ g = $\frac{1}{2}$ kg b) 500 g - 150 g = _____ g c) 1050 g - _____ g = 1 kg d) 990 g – 720 g = _____ g e) 2,5 kg -_____ g = $1\frac{1}{4}$ kg	a)$12\frac{1}{10}$ kg + 500 g = ____ kg b) 25 kg – 500 g – $1\frac{1}{4}$ kg = ____ kg c) 350 g + 150 g + _____ kg = $3\frac{1}{2}$ kg d) 18 kg + 2 $\frac{1}{2}$ kg - ____ kg = 15 kg e) 130 g + 2,5 kg + $\frac{1}{4}$ kg = ____ kg

Group 3 (a)	Group 3 (b)
a) 20 $\frac{1}{2}$ kg - 15 $\frac{1}{4}$ kg = _____ kg b) 157,5 kg – 19 kg = ____ kg c) 8 400 kg - _____ kg = 1 112 kg d) 13 $\frac{3}{4}$ kg - 7 $\frac{1}{2}$ kg = _____ kg e) 1 670 g - _____ g = 7.5 kg	a) 19 $\frac{1}{2}$ kg + 500 g - 2$\frac{1}{8}$ kg =_____ kg b) 45 kg + 1 901 g + _____ g = 50 kg c) 3,5kg - _____ g = 2 120 g d) 18 $\frac{1}{2}$ kg – ____ kg = 14 $\frac{1}{10}$ kg e) 2 000 g + _____ kg = 12 $\frac{1}{5}$ kg

- As a challenge for more able learners who finish quickly, give them further examples where they have to convert non-unit fractions to grams.

  If they know that $\frac{1}{10}$ of a kg = 100 g, they can work out that $\frac{3}{10}$ of a kg is three times as much: 3 x 100 g = 300 g.

Extension Examples

$\frac{3}{4}$ of a kg = _____ g

$\frac{4}{5}$ of a kg = _____ g

$\frac{2}{5}$ of a kg = _____ g

$\frac{3}{5}$ of a kg = _____ g

$\frac{3}{10}$ of a kg = _____ g

$\frac{7}{10}$ of a kg = _____ g

$\frac{3}{20}$ of a kg = _____ g

$\frac{9}{20}$ of a kg = _____ g

$\frac{3}{8}$ of a kg = _____ g

$\frac{7}{8}$ of a kg = _____ g

PROBLEM SOLVING (20 minutes)

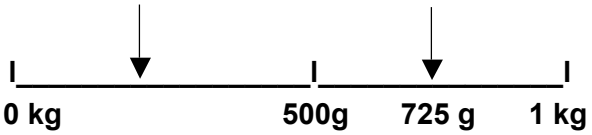
- In this section we deal with rounding off to the nearest whole kg. **Rather than telling learners the "rule" for doing this give them an example where they have to work out what the rule is by following how someone has rounded off given amounts.** They could then give reasons as to why they have settled on certain rules.

  Example

Jamal works for his father. They sell rice from a bag. Each day his father asks Jamal to tell him how much rice he has sold. Jamal first rounds off the amounts to the nearest whole kg to give him a quick estimation of his sales. Study Jamal's figures in the table below. See if you can work out what rule for rounding off he uses.

Amount	**Rounded off to the nearest kg**
3 kg 780 g	4 kg
605 g	1 kg
1 kg 466 g	1 kg
2 kg 711 g	3 kg
$2\frac{1}{4}$ kg	2 kg
$3\frac{3}{4}$ kg	4 kg
Total rounded off amount	15 kg

- Give time for learners to work this out. If they are stuck ask questions to guide their thinking. For example:
  Why does he round an amount like 1 kg 466 g down to 1 kg, but an amount like 3 kg 780 is rounded up to the next kg?
  Why does he round $2\frac{1}{4}$ kg down to 2 kg, but rounds $3\frac{3}{4}$ kg up to 4 kg?
  Once learners can tell you what they've found out and why, draw a number line like this to explain the rule clearly:



- Discus the line and the midway mark of 500 g. Give examples of amounts under and over 500g and have learners say which way to round them: up or down.

- Go back to the example of Jamal. Learners can use calculators to add the actual amounts and compare these with the rounded off total of 15 kg. They will need to convert kg amounts to grams and then convert the total in grams back to kg and grams. Suggest they use a table like this:

Amount	**In grams**
3 kg 780 g	3 780 g
605 g	605 g
1 kg 466 g	1 466 g
2 kg 711 g	2 711 g
$2\frac{1}{4}$ kg	2 250 g
$3\frac{3}{4}$ kg	3 750 g
Actual amount	14 562 g = 14 kg 562 g
Rounded off amount	15 kg
Difference	438 g

- Give a few more practice examples where learners must round off kg, fractions of a kg and gram amounts to the nearest whole kg. For example:
  a) 3 $\frac{1}{4}$ kg
  b) 498 g
  c) 2 $\frac{3}{4}$ kg
  d) 67 kg 450 g
  e) 1 kg 499 g

CONSOLIDATION (5 minutes)

Explain to learners that this is the end of the mass programme and they now need to prepare for a written assessment where you can review what they have learned. They should take their books home with him and go over the activities they have done in class and do some more written practice on their own. Summarise the main concepts covered together.

WEEK 8 : DAY 2

Notes to the teacher:
For today we have prepared a sample written assessment activity that you can use to review what learners know and can do in relation to mass. You can add or take out items as you see fit and source additional questions from learners' textbooks and other resources. Take in learners' work to mark. Record their scores noting any particular difficulties learners might have. Make time in a follow up lesson to give work back to the learners and review answers and calculation strategies together. Decide which topics you have to do more work on and think about how to fit these into your programme. Remember that when learners do capacity in Term 3, many of the same calculation strategies and principles of converting from one unit to another will be the same.
If you make these links for your learners, you will help them gain a deeper understanding of how the metric system works.
Likewise, as measurement and fractions are so strongly integrated, the more they begin to understand and can do in relation to fractions, the easier many of the measurement tasks will seem.

Resources:
Copies of the question paper and an observation sheet to record learners' scores.

ACTIVITIES FOR THE DAY

WRITTEN ASSESSMENT: Topic Mass

Question 1

How many grams are there in:

a) $2\frac{1}{2}$ kg b) $1\frac{1}{4}$ kg c) 4 kg

d) 1,5 kg e) $2\frac{1}{5}$ kg f) $\frac{3}{4}$ kg

Question 2

How many kilograms are there in:

a) 2 000 g b) 3 500 g c) 5 250 g

Question 3

Find the missing gram amounts.

a) 125 g + 45 g + _____ g = 1 kg
b) 500 g + 2 500 g + _____ g = 5,5 kg
c) 124 g + _____ g = 2 kg
d) 2,5 kg + 1,5 kg + 4,5 kg + _____ g = 12 kg

Question 5

Buti has bag of marbles that weighs $4\frac{1}{2}$ kg.
Sakkie has a bag of marbles that weighs $\frac{1}{2}$ as much.
How much does Sakkie's bag of marbles weigh?

Question 6

Which is heaver: a bag of feathers that weighs 2kg or a bag of flour that weighs 2 kg?
Explain your answer

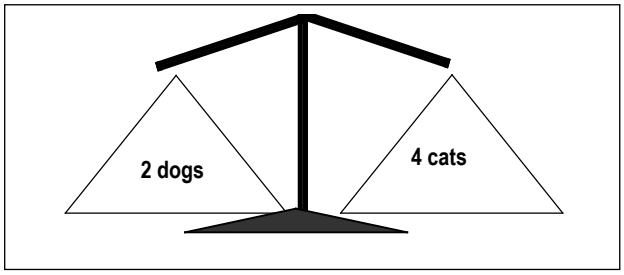
Question 7

Write in the names of these objects in the line below from lightest to heaviest:

Feather, textbook, packet of biscuits, table, rubber, chair

_____

Question 8 .



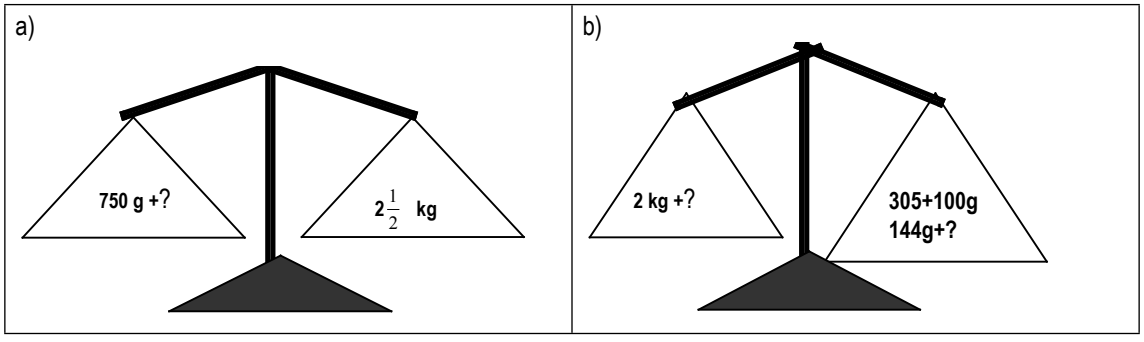
This scale shows that 2 dogs weigh the same as 4 cats.
Write the letters of the 3 statements below that are correct.

a) 1 dog weighs the same as 4 cats.
b) 1 cat weighs half as much as a dog.
c) 8 cats weigh the same as 6 dogs.
d) 12 cats weigh the same as 6 dogs.
e) 1 dog weighs the same as 2 cats.

_____

Question 9

How much must you add to the smaller mass in these two examples so that scales balance?



Question 10

a) Round these masses to the nearest kg to estimate the total:

1 kg 350 g + 2,5 kg = _____ 4 kg 120 g + 1 kg 890 g = _____

b) Add the amounts to find the real total.

c) Find the difference between your rounded off amount and the real total.

Question 11

Lebo work at a café.

Each day she fills sugar bowls that hold $\frac{1}{4}$ of a kg of sugar from a 2,5 kg packet.

a) How many sugar bowls does Lebo fill?

b) How many kg of sugar does Lebo use in 5 days?

Question 12

A lift can carry 500 kg at a time. 4 men get into the lift.

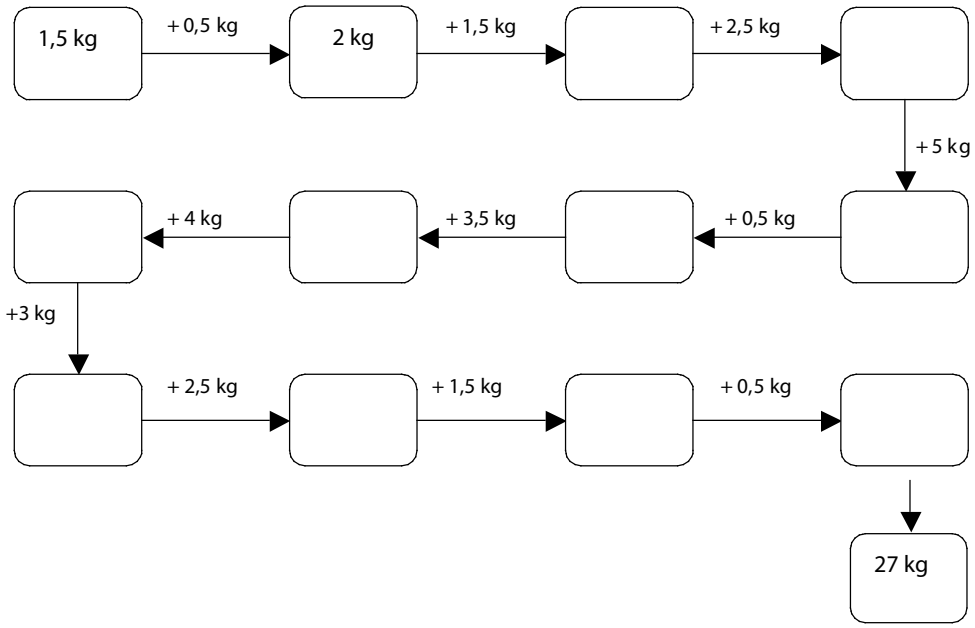
- George weighs 67 kg
- Len weighs 79 kg
- Andy weighs 58 kg
- Smangy weighs 56, 5 kg

a) How much do the men weigh altogether?

b) How many more kg can the lift hold?

Question 13

Add on the given amounts. Write your answers in the blocks. Use the example to guide you.



ASSESSMENT	**FORMAL**: Written assessment activity covering all aspects of mass dealt with over the 7 day programme.

WEEK 8: DAY 3

Notes to the teacher:

- In this lesson learner will use doubling to make number patterns, and halving to solve mathematical problems.
- Learners will also experience division as the inverse of multiplication.
- Learners will practice multiplication with one-digit numbers, while forming number patterns

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Say to the learners:

I am now going to help you to make your own number pattern. Just do what I say.

Say to them:

Choose any number from 1 to 10 and write it down.

Double your number, and add one to the answer.

Write your new number down, next to your original number.

Double your new number, and add one to it.

Write your new new number down, next to the previous one.

Continue like this to make at least five more numbers.

For example, a learner who chose the starting number 6 will produce the following number pattern:

6 13 27 55 111 223 447 895

Activity 2

Let each learner now choose a different number between 2 and 10, and form the first eight numbers in another number pattern in the same way.

Let each learner exchange the final number in any of his/her two number sentences with a classmate. Each learner should then try to find out what the other learners' starting number was. Learners may repeat this for some time, making more number patterns by starting with numbers bigger than ten, and challenging each other to figure out the starting numbers.

Activity 3

Let learners make more similar patterns now, not by doubling and adding 1 each time, but by doubling and *subtracting* 1. For example, if the starting number is 6 this will result in 6 11 21 40 79 . . . . .

Again, let learners exchange their eighth numbers with classmates, and try to figure out how each others' number pattern was formed, like in activity 2.

Activity 4

Let learners make more number patterns by doubling, but now allow them to add or subtract other numbers than 1, and let each learner decide what he/she will add or subtract after

doubling. A learner may for instance decide to double and then add 3, and start with the number 5, to produce the following pattern:

5 13 68 343 1718 . . . . .

Activity 5

Say to the learners:

In activity 1 you chose a starting number and I told you to multiply it by 2 and to add 1.

In this activity, I will tell you what number you start with, but you will decide what you multiply it with and what you add.

So, chose a number bigger than 2 and smaller than 6 to multiply with,
and a number bigger than 2 and smaller than 6 to add.

Write your decisions down.

Now use 2 as a starting number and make your pattern, up to the sixth number.

For example, a learner who chose to multiply by 4 and add 3, will produce the following number pattern:

2 11 47 191 767 3071

Activity 6

Let learners choose new numbers to multiply with and to add, and each form as number pattern starting with 1.

Let them then exchange the fifth numbers in their patterns with classmates, and try to figure out how each others' number pattern was formed, like in activity 2.

Learners may find this quite challenging and they may not succeed, but they will get substantial computation practice in the process.

WEEK 8: DAY 4

Notes to the teacher:

- Continuation of the work on number patterns. At the same time, this work is practice in mental and written multiplication, and addition and subtraction.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Inform learners that they will learn a different way of making number patterns today. Write the numbers 1,2, 3 etc on the board, up to 10, and ask learners to do the same in their classwork books:

1 2 3 4 5 6 7 8 9 10

Tell learners that each of them should now choose a number between 4 and 11, and write it down. Then they should multiply each of the above numbers with their chosen number, and add 2 to the answer. The results should be written down directly below the above numbers. For example, if one chooses 3 (which learners were not allowed to do), the results will be as shown below:

1 2 3 4 5 6 7 8 9 10

5 8 11 14 17 20 23 26 29 32

Each learner should make five different patterns, by choosing different numbers to multiply with, between 4 and 11.

Activity 2

In this activity, learners will again (like on the previous day) challenge each other to figure out how their patterns work. Let each learner choose one of his/her patterns, and exchange it with a classmate. The classmate has to figure out how the pattern was made.

Activity 3

Let learners make patterns like in activity 1, but now they may choose larger numbers to multiply with, and they may decide what to add (or subtract) each time. Again, learners should exchange patterns with classmates like in activity 2, to figure out how each others' patterns were produced.

Activity 4

Arrange learners in discussion groups of three or four, and ask them to tell each other how they go about when they try to figure out each others' patterns.

WEEK 8: DAY 5

Notes to the teacher:

- Continuation of the work on number patterns.

.

Resources:

- Prepare and copy 5 different patterns like those made on Week 8 Day 4, as an assessment task for Activity 1. Example:"
  7 11 15 19 23 27 31 35 39 43 47
  Learners have to figure out how the patterns work, and write this down.

ACTIVITIES FOR THE DAY

ASSESSMENT

Use the assessment task that you have prepared.

Allow learners 30 minutes to do the assessment task.

CONSOLIDATION

Let learners make more patterns like on the previous day, this time starting with multiples of 10 instead of the numbers 1 to 10:

10 20 30 40 50 60 70 80 90 100

For example, if one multiplies with 4 and subtracts 3, the resultant pattern is:

37 77 117 157 197 237 277 317 357 397

Again let learners challenge each other to figure out their patterns.

SECOND TERM WEEK 9

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 1, 3 and 4	**Milestones:** • Investigates and compares (alone and/or as a member of a group or team) three-dimensional objects • In the range up to 2 000: - Say which of two given numbers is bigger. • Orders more than two given numbers from smaller to bigger • 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 2 000.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Mental multiplication. Compare and order 4-digit numbers. Represent 4-digit numbers (expanded notation)	Mental addition and subtraction. Compare and order 4-digit numbers.	Make shapes (cubes)	Investigate capacity of boxes by placing small cubes into them.	Make shapes (cubes)
Resources	Annexure K Annexure B.	Annexure K Annexure B	Empty boxes, glue, scissors, rulers.		Empty boxes, glue, scissors, rulers.

Note that many scissors are needed for days 3 and 5. However, the work of day 3 may be done on any of the first 3 days, so that the available scissors can circulate from class to class over the first three days.

WEEK 9: DAY 1

Notes to the teacher:

- This lesson is devoted to consolidation of number knowledge (multiplication facts) and number concept.

Resources:

- A copy of the multiplication fact cards (Annexure K) for every three learners.
- A copy of the four-digit number cards (Annexure B) for every three learners
- A copy of Annexure I (Many 3-digit numbers), cut into strips with 5 numbers on each strip, one strip for each learner.
- A n A4 sheet for each learner

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITIES

Activity 1

Learners play the number bond game, as described in the lesson plan for Term 1, Week 4, Day 1, with the multiplication fact cards (Annexure K). The groups should be no more than 4 learners per group.

Activity 2

Learners play the number placing game as described in the lesson plan for Week 2 Day 1, with the 4-digit number cards (Annexure B).

ASSESSMENT

Activity 3:

Hand out the strips with 4-digit numbers (5 numbers on each strip), that you have cut from Annexure P. Different learners should get different sets of numbers. Learners should write their names at the top of the sheets.

Ask learners to do the following for each number:

- make a drawing to show how they will represent the number with flard cards;
- write the number in expanded notation;
- write the number in words.

Learner may use their flard cards to figure out how to represent the numbers.

At the bottom of the sheet, they have to write the five numbers, from smallest to largest.

Take the sheets in for assessment when learners have finished, so that you can analyse their answers to help you prepare for the teaching challenges you face this term.

Ask learners to again bring empty cereal (or similar) boxes to class the next day.

WEEK 9: DAY 2

Notes to the teacher:
- This lesson is devoted to consolidation of number knowledge (addition and subtraction facts) and number concept

Resources:
- A copy of the multiplication fact cards (Annexure K) for every three learners.
- A copy of the number bond cards (Annexure H) for every three learners

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Learners play the number placing game as described in the lesson plan for Week 2 Day 1, with the 4-digit number cards (Annexure B), with the additional rule that a number card can only be placed if it differs by less than 100 from the card next to which it is placed.

Activity 2

Learners play the number bond game, as described in the lesson plan for Term 1, Week 4, Day 1, with the larger number bond cards (Annexure H). The groups should be no more than 4 learners per group.

WEEK 9: DAY 3

Notes to the teacher:

- Learners will make 1 cm by 1 cm cubes today, as a first step in doing work on volume and capacity.

Resources:

- Empty cereal (or similar) boxes.
- A pair of scissors for each learner.
- Glue.
- Each learner will need a ruler.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

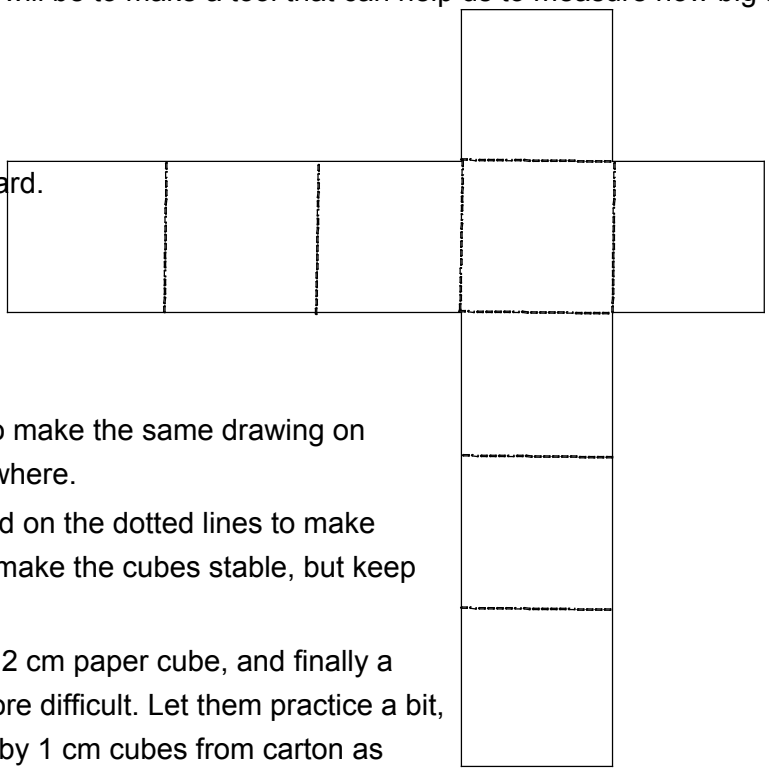
Activity 1

Show some of the paper or cardeboard prisms that learners have made, and ask learners how one may possible compare the sizes of different prisms to say which is biggest and which is smallest. Allow some discussion.

Announce that the work of the day will be to make a tool that can help us to measure how big a container is.

Activity 2

Make a drawing like this on the board.



Learners have to use their rulers to make the same drawing on a sheet of paper, 3 cm wide everywhere.

They should then cut it out, and fold on the dotted lines to make a 3 cm by 3 cm cube. Use glue to make the cubes stable, but keep one face open..

Let learners the n make a 2 cm by 2 cm paper cube, and finally a 1 cm by 1 cm cube. This will be more difficult. Let them practice a bit, then let them make as many 1 cm by 1 cm cubes from carton as they can.

WEEK 9: DAY 4

Notes to the teacher:

- This is a continuation of the previous day's work.

Resources:

- Empty cereal (or similar) boxes.
- A pair of scissors for each learner.
- Glue.
- Each learner will need a ruler.

ACTIVITIES FOR THE DAY

INVESTIGATION

Activity 1

Ask learners how many of the 1 cm by 1 cm cubes they think can fit into the 3 cm by 3 cm cube.

Activity 2

Learners investigate how many 1 cm by 1 cm cubes they think can fit into the 3 cm by 3 cm cube, by using the cubes they have made. They may have to share 1 cm by 1 cm cubes to have enough.

Activity 3

Let learners make some 3 cm by 4 cm by 5 cm paper or cardboard cubes, and investigate how many 1 cm by 1 cm cubes can be packed into it.

WEEK 9: DAY 5

Notes to the teacher:

- This is a continuation of the previous day's work.

Resources:

- Empty cereal (or similar) boxes.
- A pair of scissors for each learner.
- Glue.
- Each learner will need a ruler.

ACTIVITIES FOR THE DAY

PRACTICAL

Each learner makes as many neat accurate 1 cm by 1 cm cardboard cubes as he/she can. This must be stored safely for future use.

SECOND TERM WEEK 10

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 1, AS 6, 8, 9. LO 4 As 1 LO 3 As 1 and 2.	**Milestones:** • Know or quickly determine addition and subtraction facts for • multiples of 10 to at least 1000, • multiples of 100 to at least 2000 • Solving problems involving all operations. • Solves problems involving equal sharing and measurement, involving fractions including halves, thirds, quarters, fifths, sixths, sevenths, eighths, ninths and tenths and mixed numbers • Learners will measure each side of different 2-dimensional shapes and add all the measurements together

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Mental multiplication. Comparing and ordering 4-digit numbers..	Problem solving.	Working with fractions. Experiencing equivalent fracstions.	Measurement and properties of shapes.	Measurement and properties of shapes.
Resources	Annexure K Annexure H.	Worksheets.	Term 1 Annexure Q: Fractionrulers.	Rulers.	Rulers.

WEEK 10: DAY 1

Notes to the teacher:

- This lesson is devoted to consolidation of number knowledge (addition and subtraction facts) and number concept

Resources:

- A copy of the multiplication fact cards (Annexure K) for every three learners.
- A copy of the number bond cards (Annexure H) for every three learners

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Learners play the number placing game as described in the lesson plan for Week 2 Day 1, with the 4-digit number cards (Annexure B), with the additional rule that a number card can only be placed if it differs by less than 100 from the card next to which it is placed.

Activity 2

Learners play the number bond game, as described in the lesson plan for Term 1, Week 4, Day 1, with the multiplication fact cards

WEEK 10: DAY 2

Notes to the teacher:
- In this lesson learners will work at a variety of problems, as contained in the workbooks

Resources:
- Workbooks

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Learners work at the problems given in the worksheet for the day.

Let learners work individually for the first half of the lesson, then compare their work in small groups during the second half of the lesson.

WEEK 10: DAY 3

Notes to the teacher:

- In this lesson learners will engage with more fraction units, specifically twelfths, twentieths, fiftieths and hundredths. The concept of hundredths is a prerequisite for understanding centimeters as hundredths of a metre.

Resources:

- A copy of Pencil Sheet F of Term 1 Annexure Q for each learner.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Hand out a copy of Pencil Sheet F to each learner. Learners have to measure the pencils A1 to A5 with the rulers next to which the pencils are placed. They have to do this individually.

Note that this is quite a demanding task. It requires that learners have a good understanding of how fractions are formed when a whole is sub divided into equal parts. Circulate between learners. One way in which you can help learners without creating the risk that they simply start to parrot the information you give them, is to ask the following question, pointing to the subdivisions on the ruler:

What part of a stick is each of these sections?

Here are the lengths of the pencils:

Pencil A1 is one and 17 twentieths of a STICK long.

Pencil A2 is one and 41 fiftieths of a STICK long.

Pencil A3 is one and 9 twelfths of a STICK long.

Pencil A4 is one and 60 hundredths (or 6 tenths) of a STICK long.

Pencil A5 is one and 67 hundredths of a STICK long.

WEEK 10: DAY 4

Notes to the teacher:

- Learners will draw a variety of shapes accfurately..

Resources:

- Rulers.

ACTIVITIES FOR THE DAY

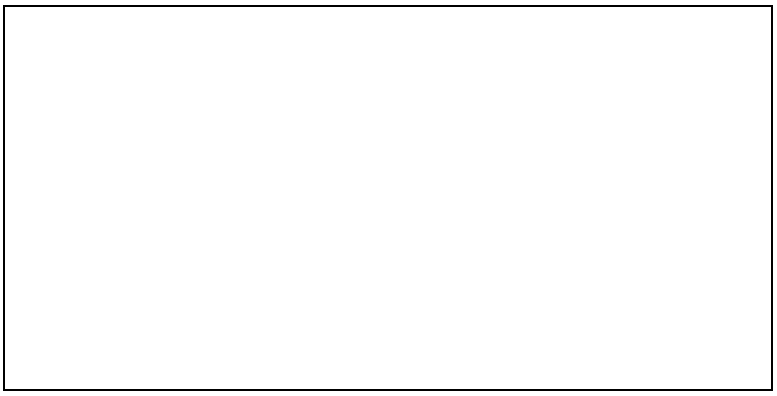
CONCEPT DEVELOPMENT

Write the following specifications on the board.

Learners have to draw these shapes as accurately as they can, using rulers and pencils.

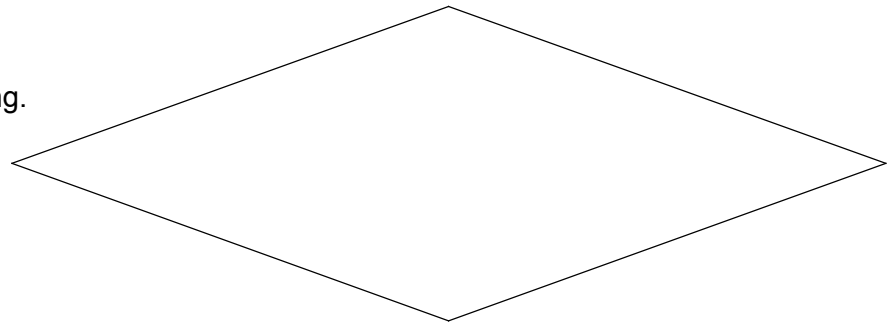
Length must be 18 cm.

Width must be 12 cm



Each side must be 10 cm long.

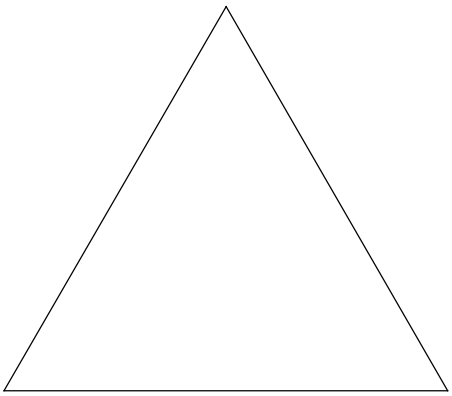
The height, in the middle, must be 6 cm.



Learners have to find out what is the perimeter of each of the figures.

Learners also have to draw each figure in double the size, and half the size specified here.

Each side of the triangle must be 8 cm long.



WEEK 10: DAY 5

Notes to the teacher:

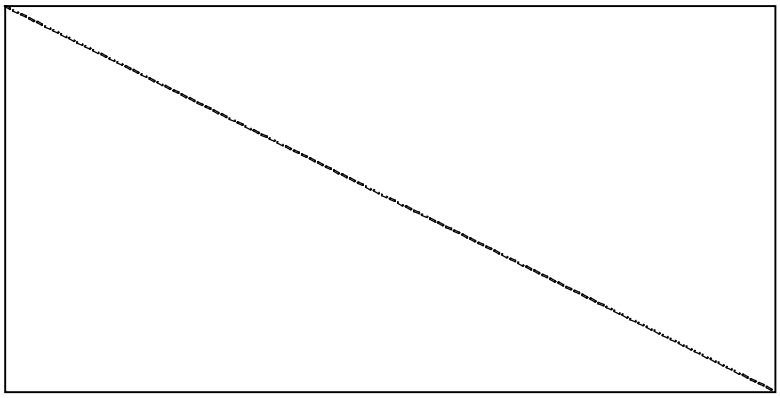
- In this lesson learners will measure certain elements of the figures they have drawn on the previous day.

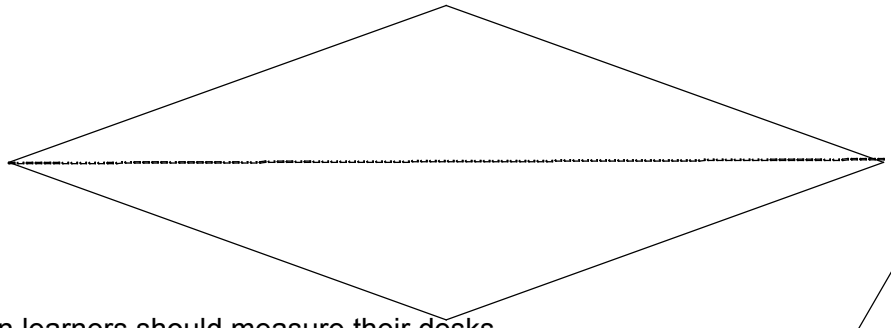
Resources:

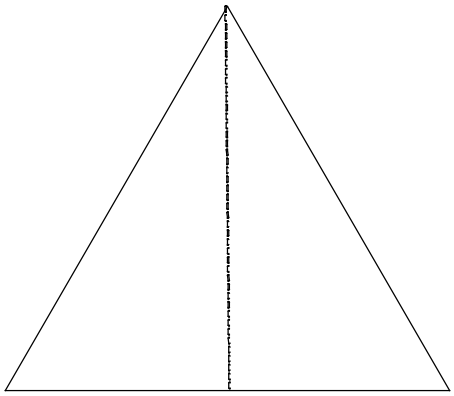
- Rulers.

ACTIVITIES FOR THE DAY

Draw the figures on the board. Learners have to measure all the dotted lines, on the figures they have drawn on the previous day, and compare their answers.



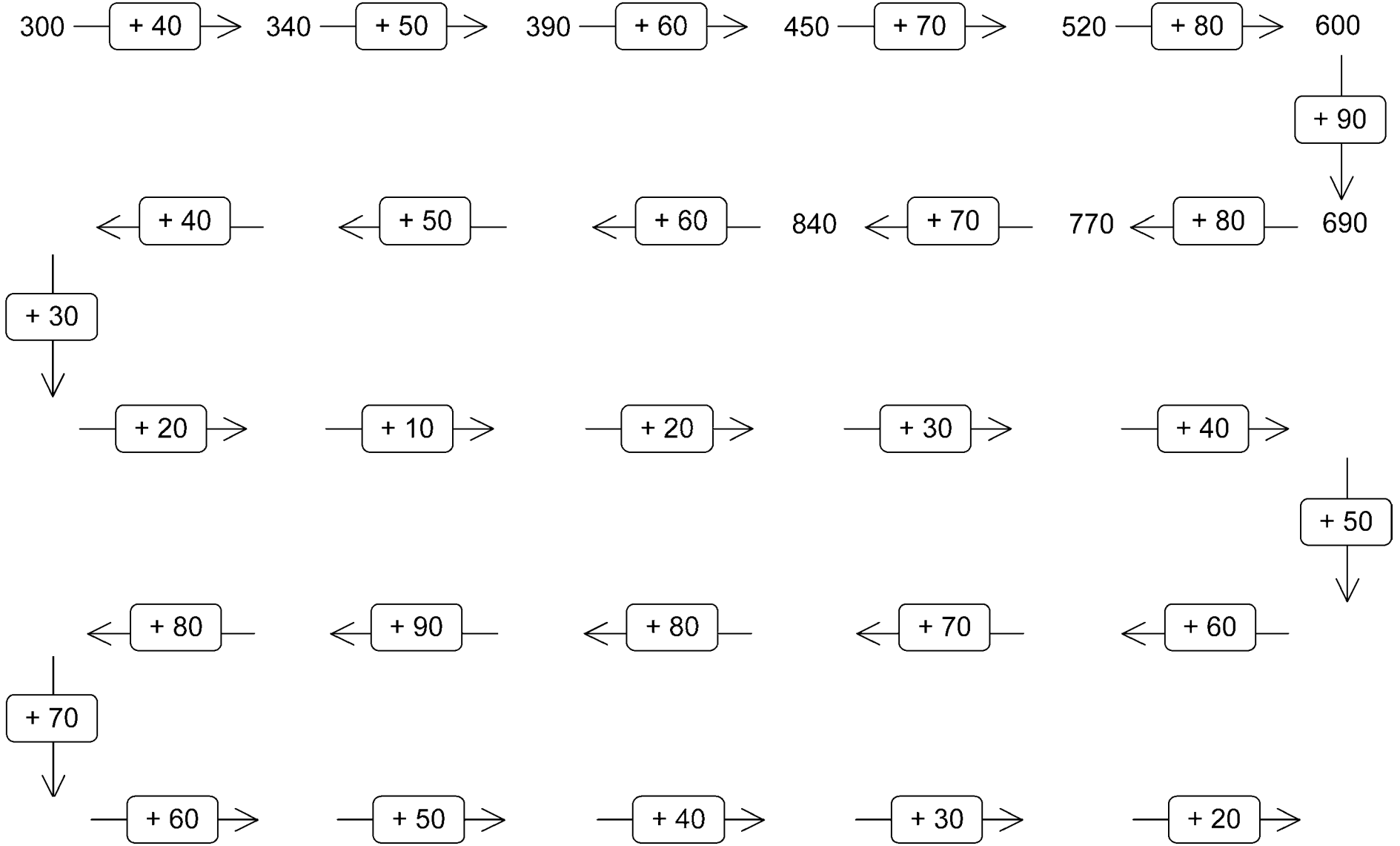




Then learners should measure their desks (every element they can) and write a report that describes the desk.

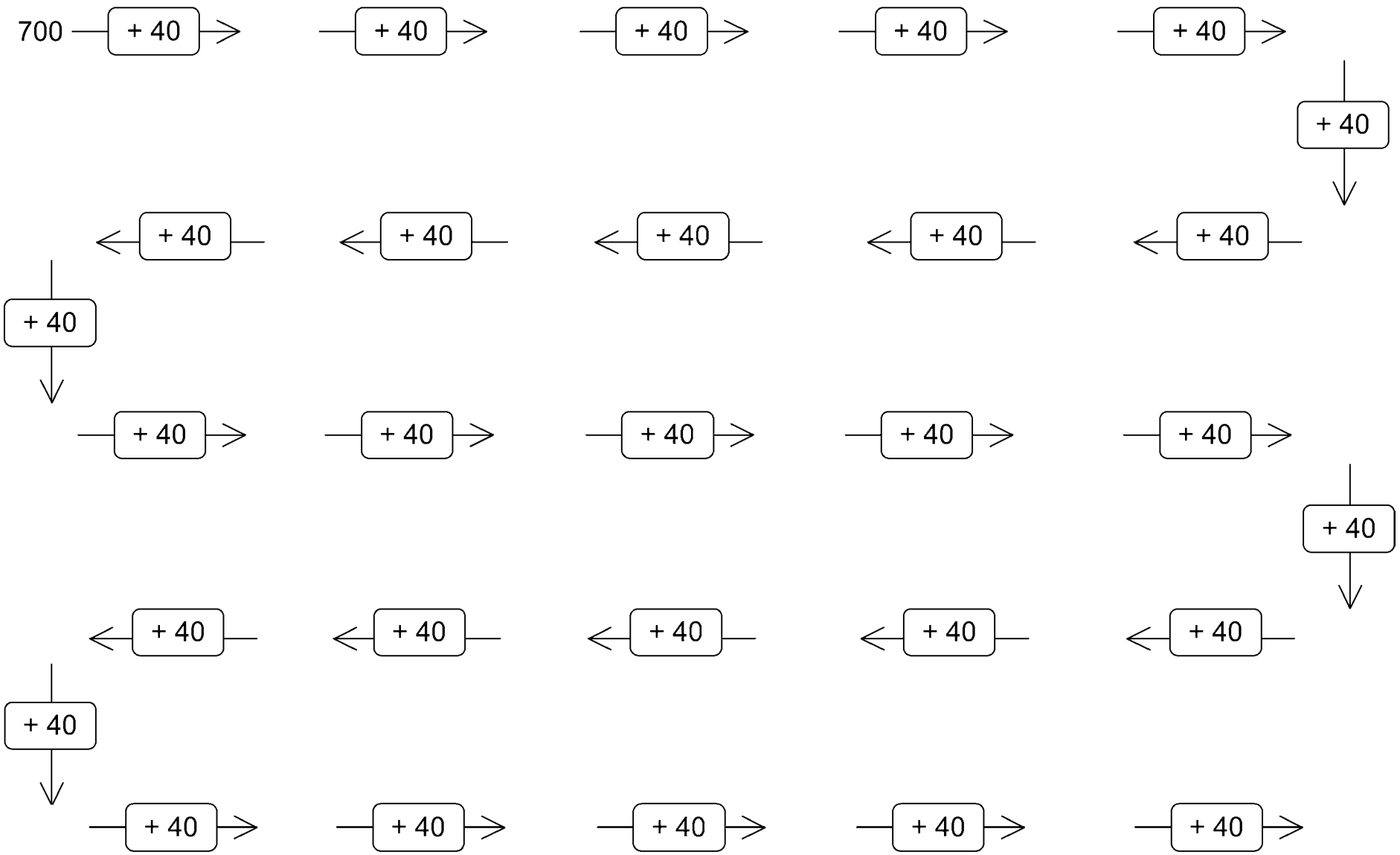
ANNEXURES

Number journey A

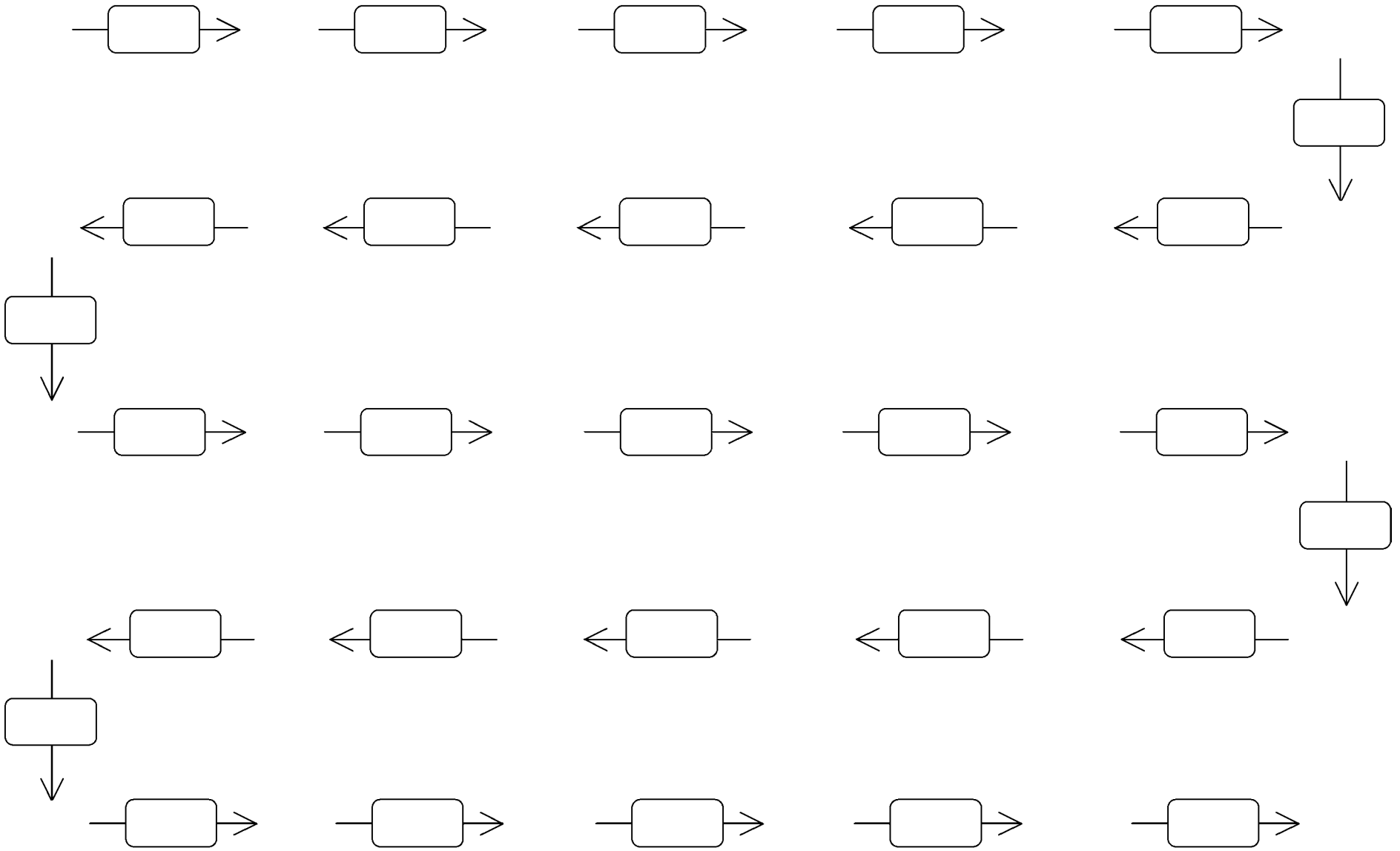


Term 2 Annexure A (Number journeys series 1)

Number journey B



Number journey X



Term 2 Annexure A (Number journeys series 1)

1009	1105	1205
1013	1119	1210
1020	1127	1221
1036	1135	1238

Term 2 Annexure B (Four-digit number cards)

1049	1142	1248
1057	1157	1254
1069	1165	1265
1076	1177	1272

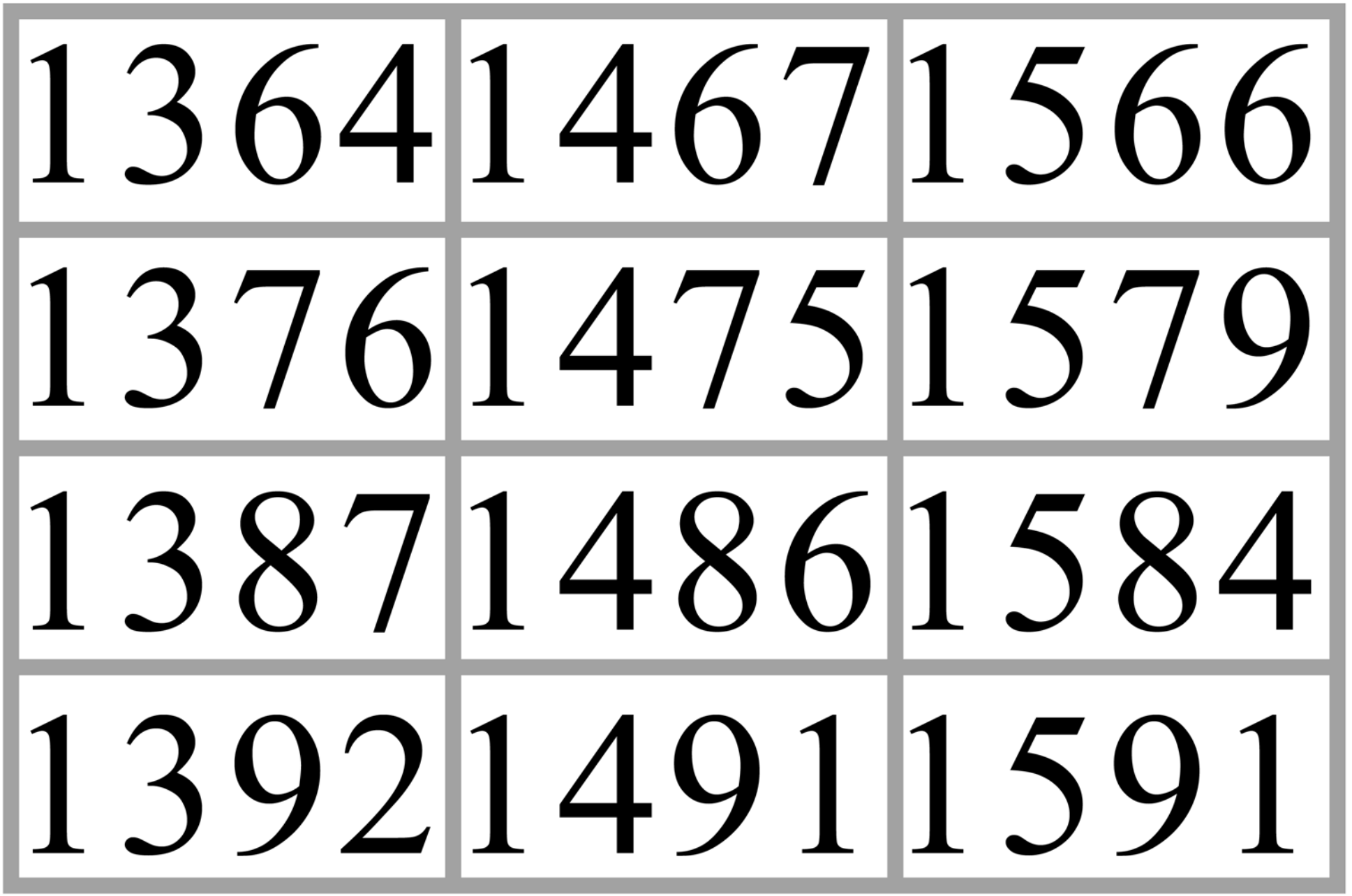
Term 2 Annexure B (Four-digit number cards)

1 081	1 188	1 282	1 282
1 090	1 194	1 298	1 298
1 307	1 407	1 500	1 500
1 311	1 418	1 510	1 510

Term 2 Annexure B (Four-digit number cards)

1324	1427	1528
1332	1435	1536
1342	1440	1546
1357	1454	1558

Term 2 Annexure B (Four-digit number cards)



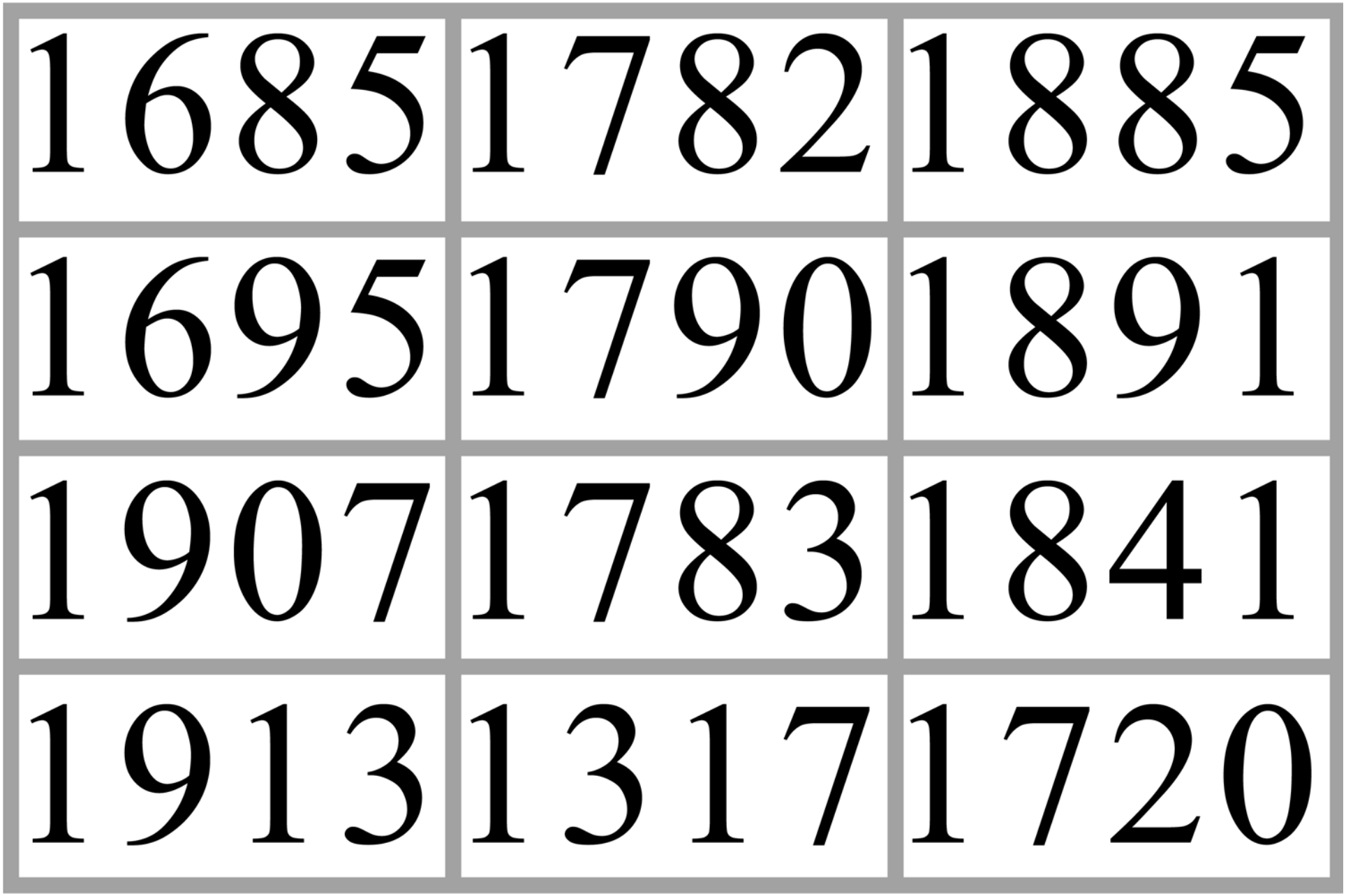
Term 2 Annexure B (Four-digit number cards)

1602	1709	1808
1617	1719	1810
1625	1725	1827
1636	1736	1833

Term 2 Annexure B (Four-digit number cards)

1648	1749	1841
1656	1758	1851
1665	1769	1867
1675	1772	1878

Term 2 Annexure B (Four-digit number cards)



Term 2 Annexure B (Four-digit number cards)

1923	1467	1478	
1936	1803	1991	
1943	1090	1901	
1952	1153	1367	

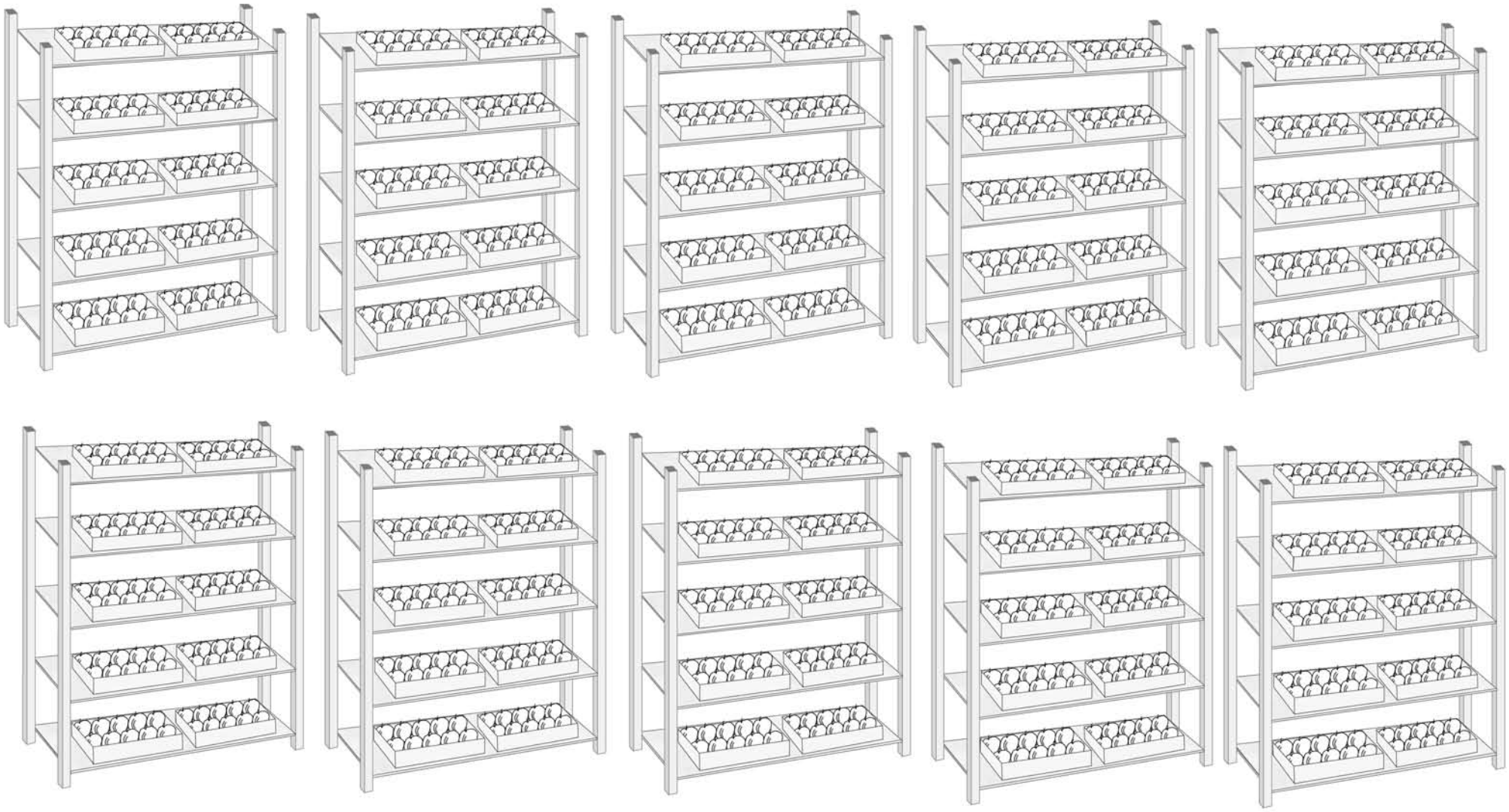
Term 2 Annexure B (Four-digit number cards)

1967	1989	1022
1973	1334	1180
1989	1271	1672
1994	1398	1896

Term 2 Annexure B (Four-digit number cards)

Sheet A

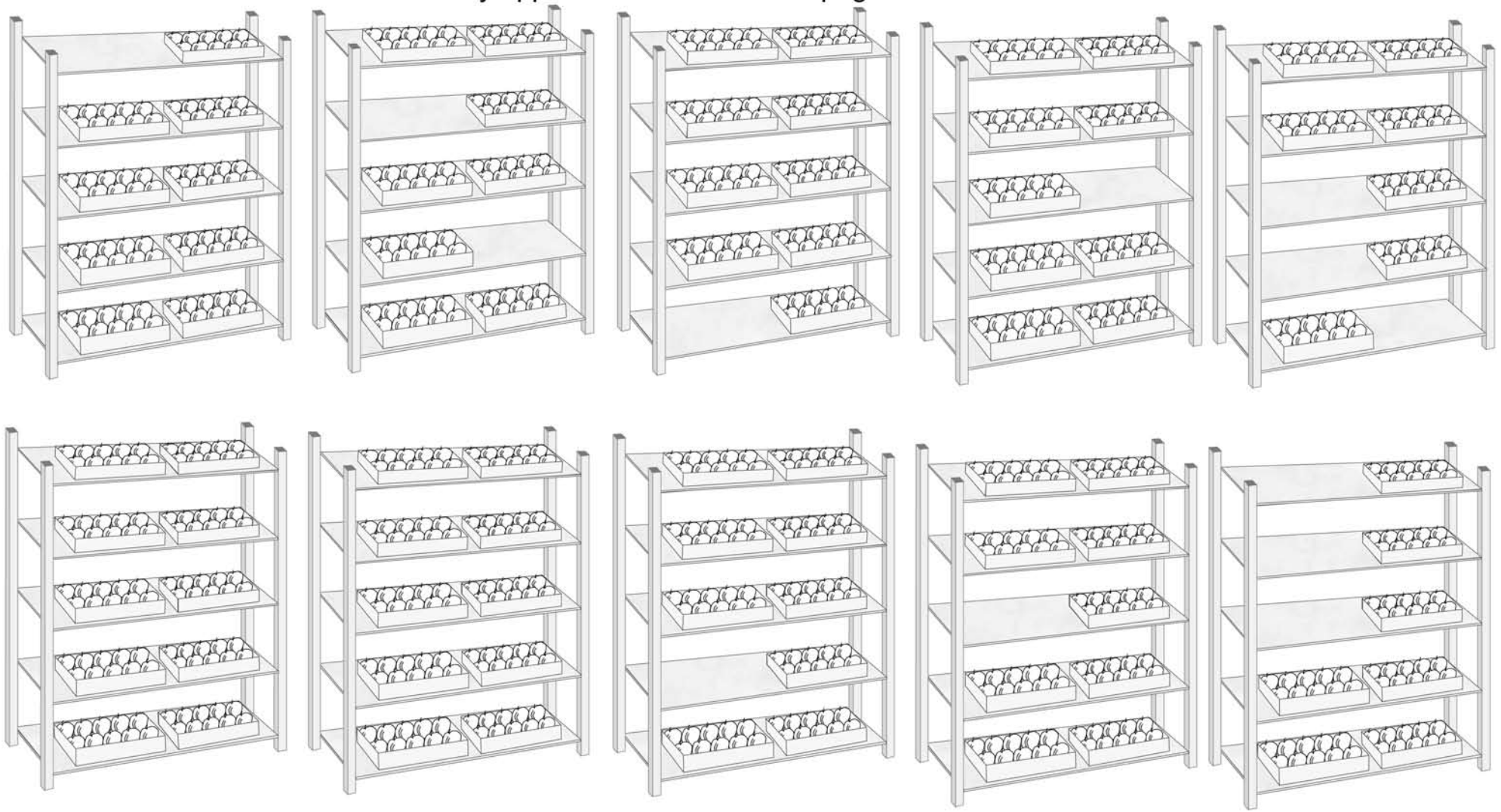
How many apples are shown on this page?



Term 2 Annexure C (Apple counting sheets)

Sheet B

How many apples are shown on this page?



Term 2 Annexure C (Apple counting sheets)

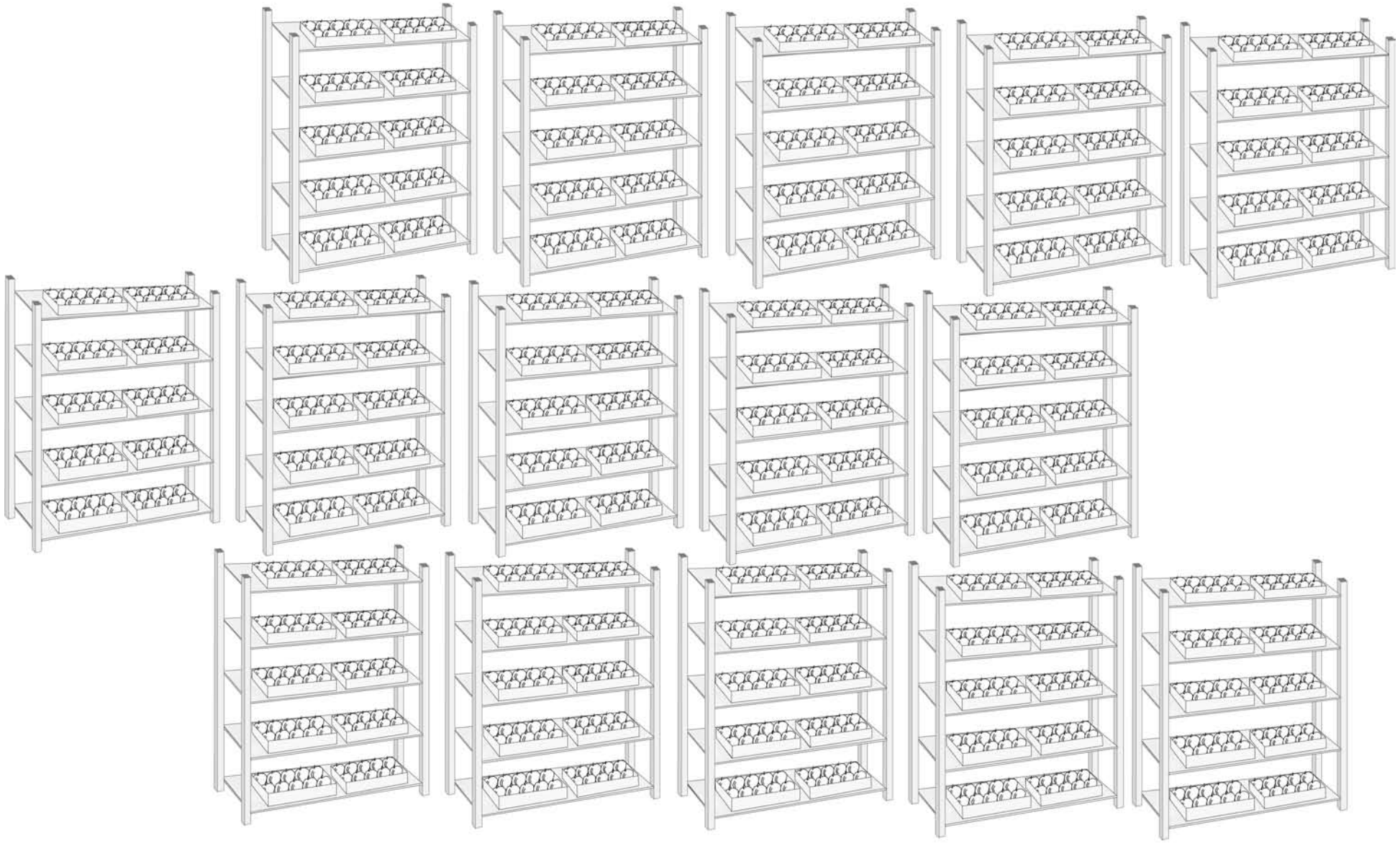
Sheet C

How many apples are shown on this page?

Term 2 Annexure C (Apple counting sheets)

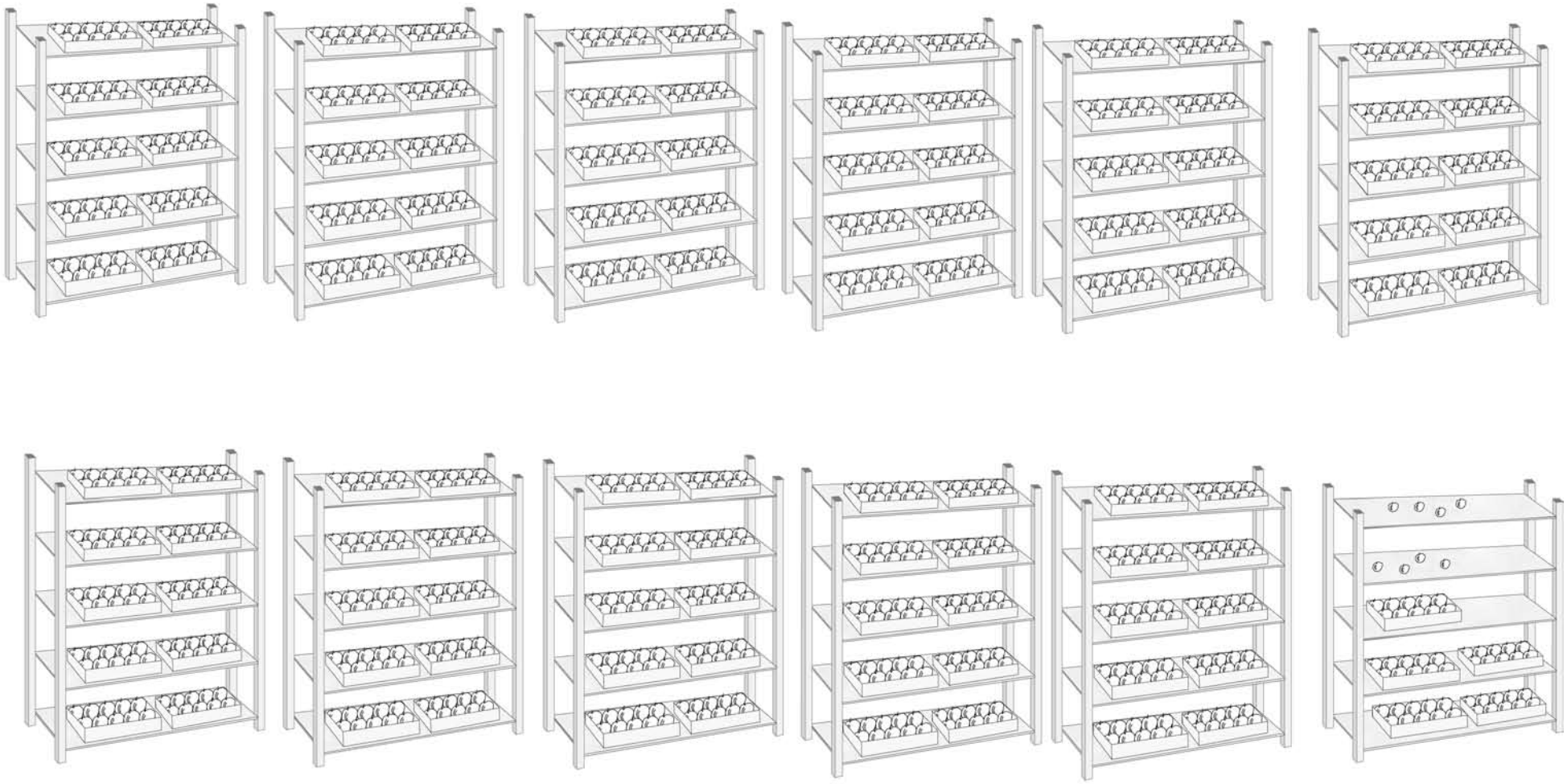
Sheet D

How many apples are shown on this page?



Term 2 Annexure C (Apple counting sheets)

Sheet E How many apples are shown on this page?

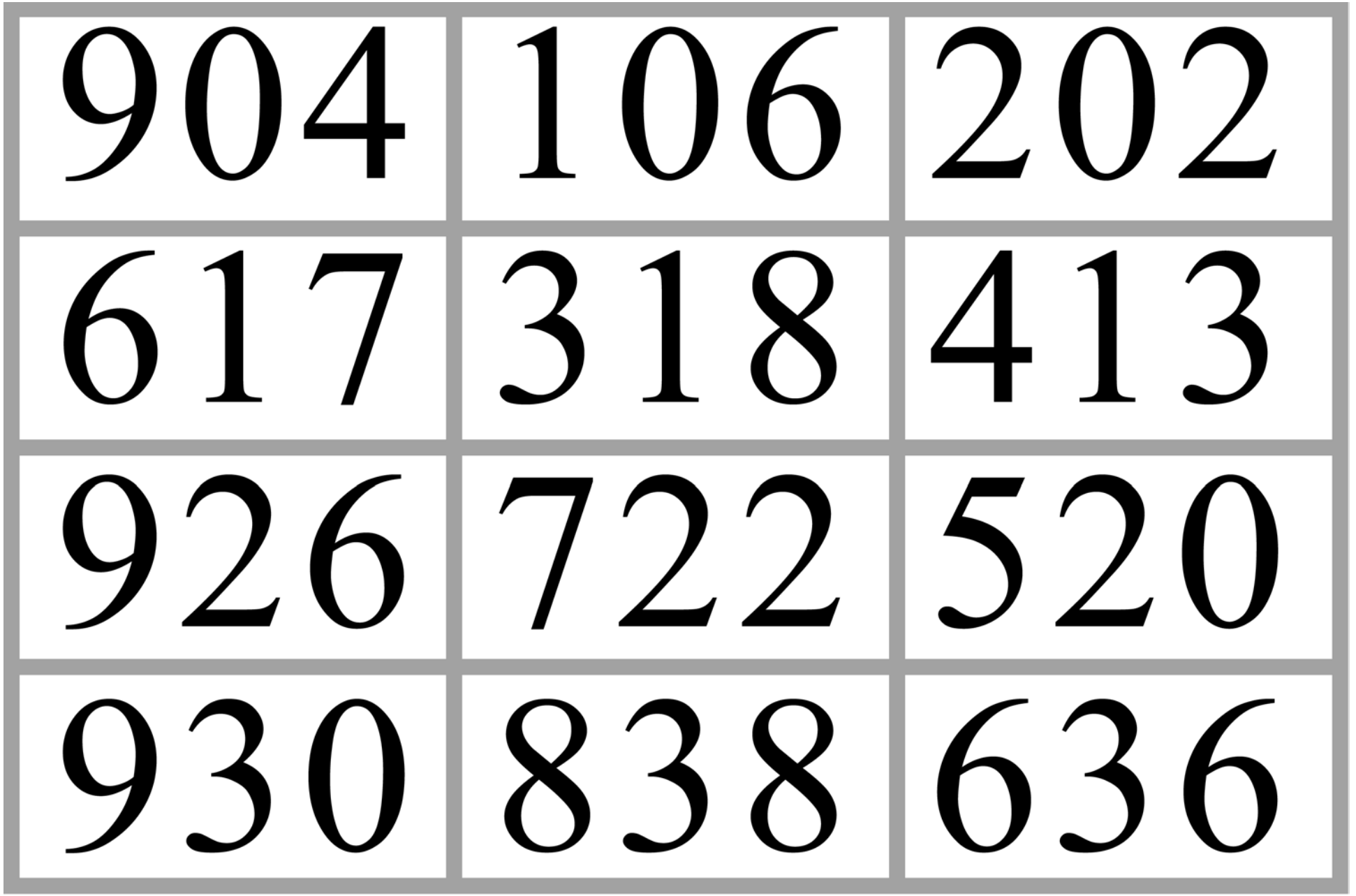


Term 2 Annexure C (Apple counting sheets)

Sheet F How many apples are shown on this page?



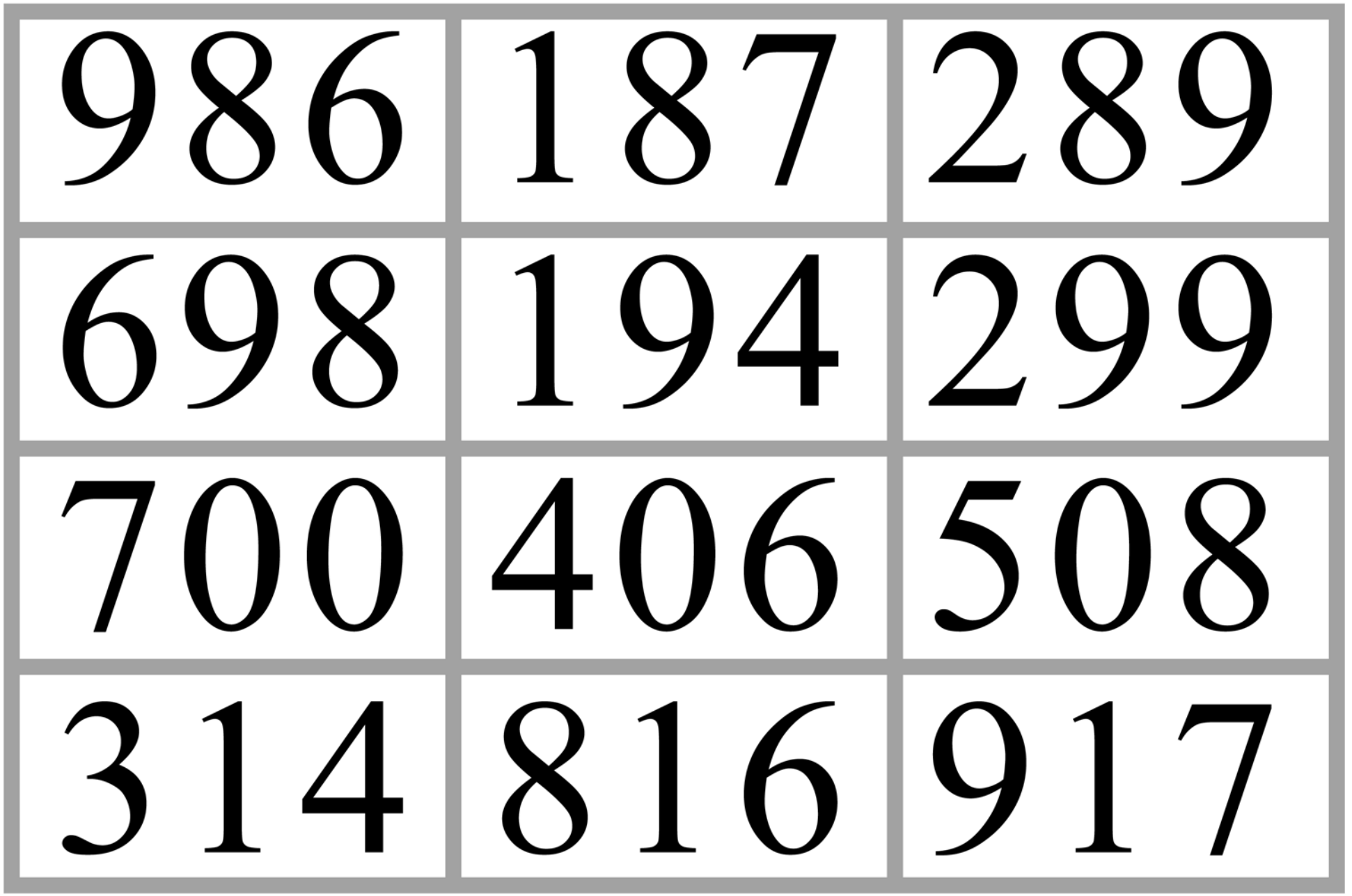
Term 2 Annexure C (Apple counting sheets)



Term 2 Annexure D (Number cards 1000 to 1003)

945	145	249
850	753	654
368	462	569
976	874	777

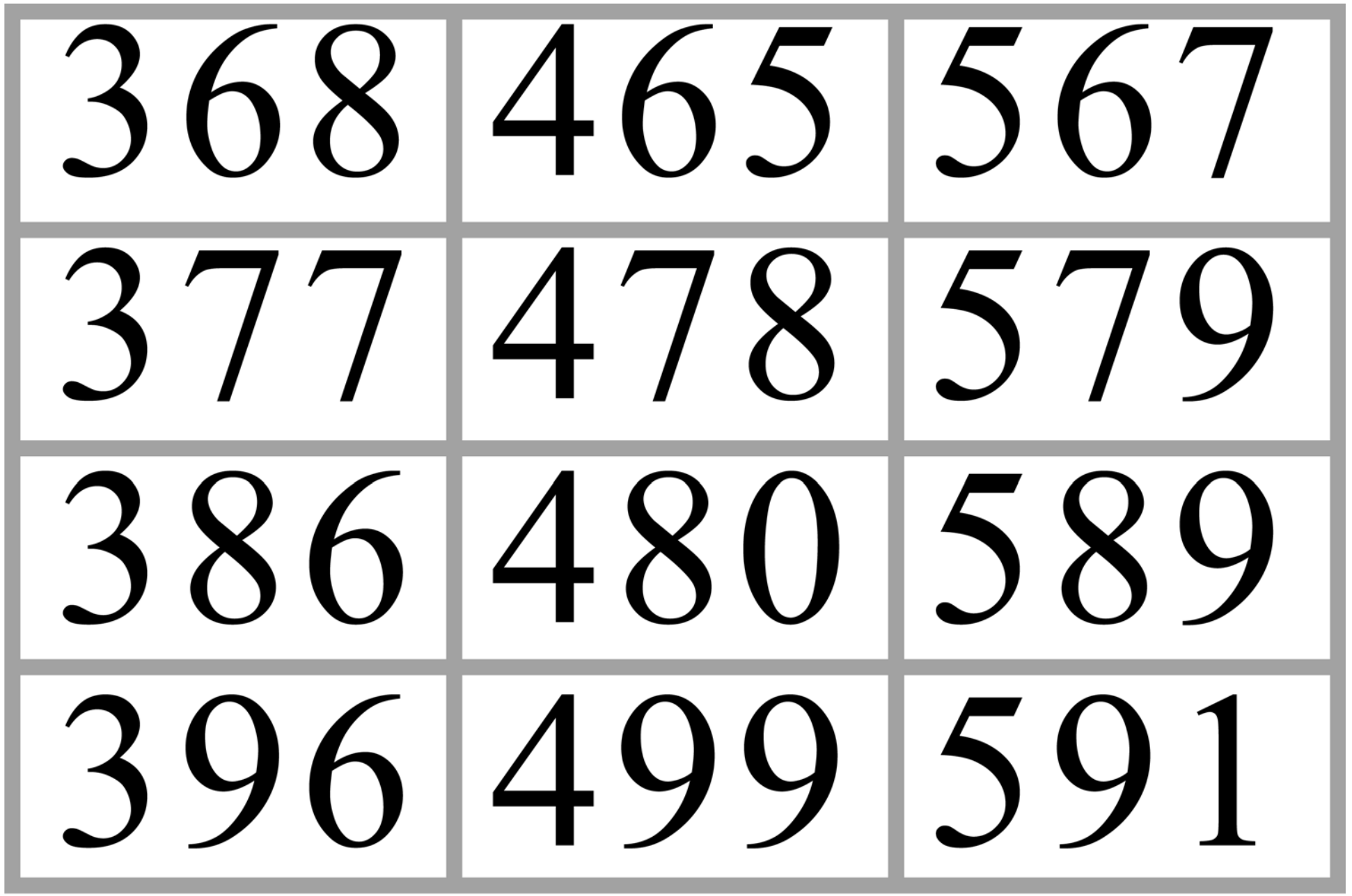
Term 2 Annexure D (Number cards 1000 to 1003)



Term 2 Annexure D (Number cards 1000 to 1003)

320	427	528
333	437	535
344	443	548
358	453	551

Term 2 Annexure D (Number cards 1000 to 1003)



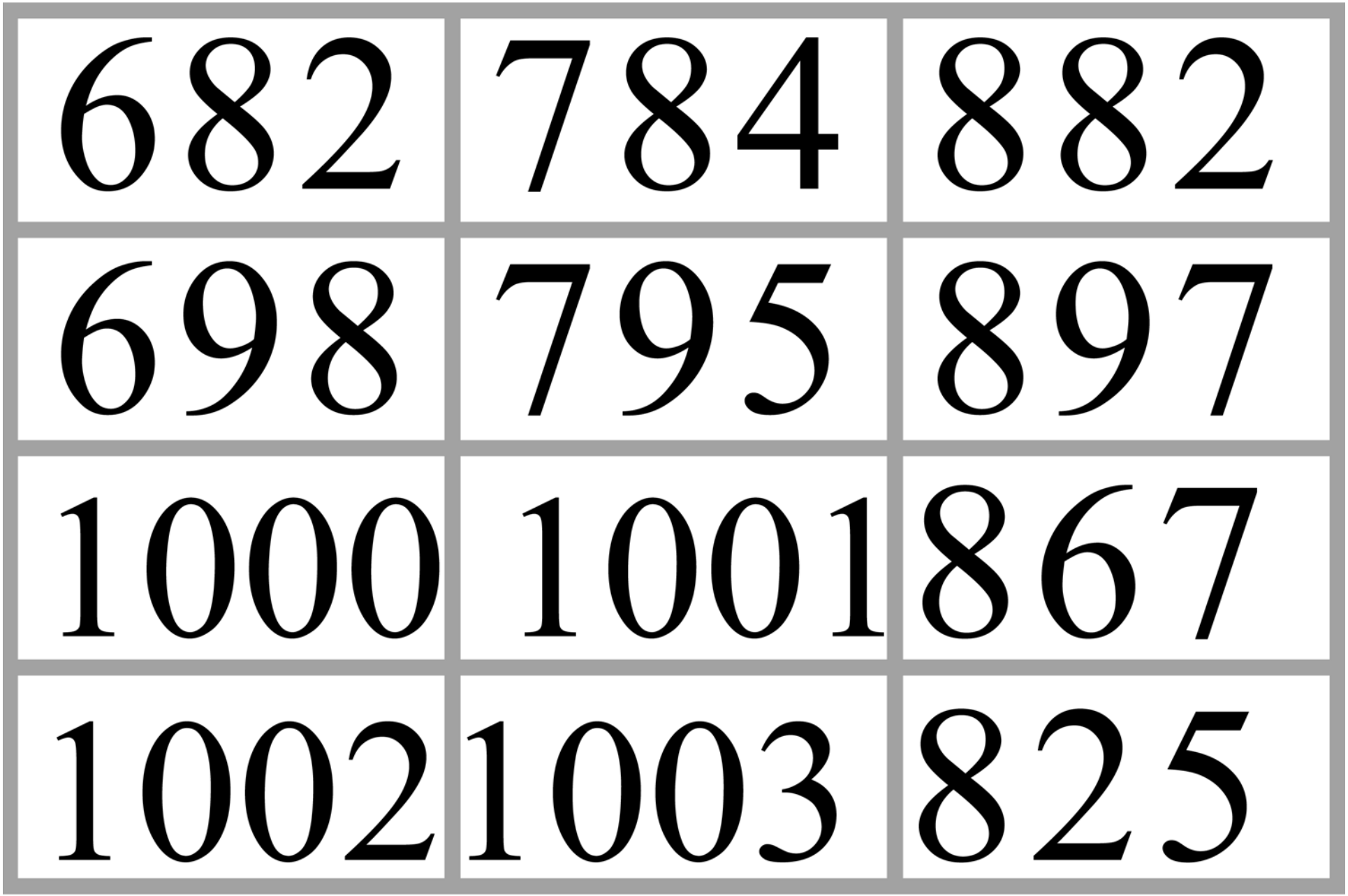
Term 2 Annexure D (Number cards 1000 to 1003)

601	708	801
615	717	816
623	723	821
638	733	832

Term 2 Annexure D (Number cards 1000 to 1003)

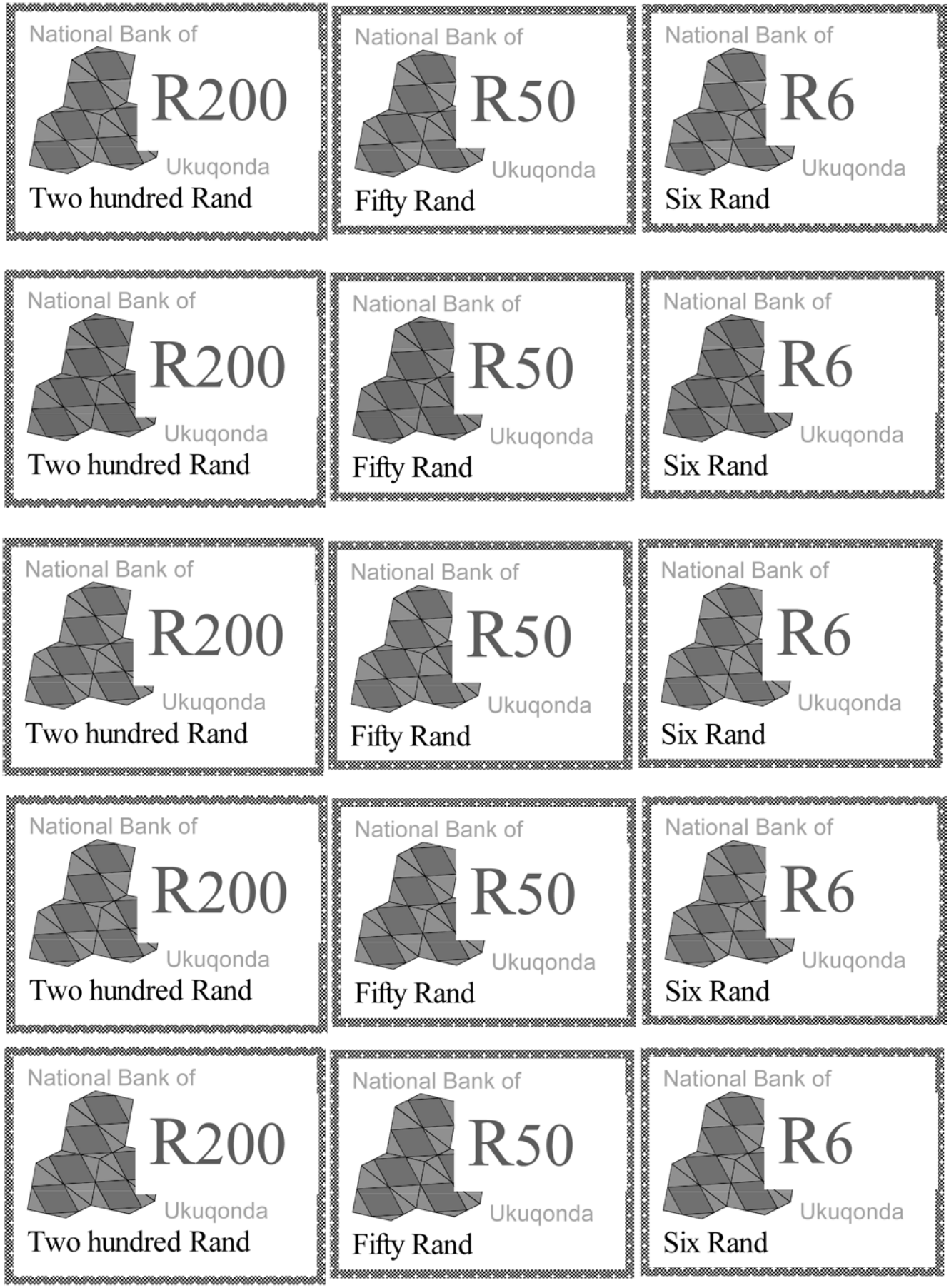
648	749	845
653	758	851
663	764	868
672	774	872

Term 2 Annexure D (Number cards 1000 to 1003)



Term 2 Annexure D (Number cards 1000 to 1003)

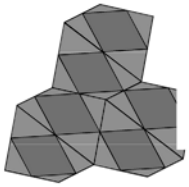
Money sheet A



Term 2 Annexure F (Money sheets)

Money sheet B

National Bank of

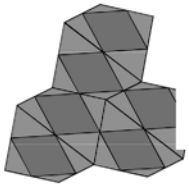


R400

Ukuqonda

Four hundred Rand

National Bank of

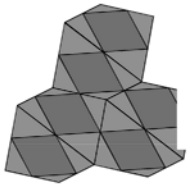


R600

Ukuqonda

Six hundred Rand

National Bank of

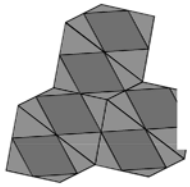


R40

Ukuqonda

Fourty Rand

National Bank of

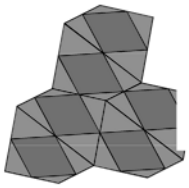


R70

Ukuqonda

Seventy Rand

National Bank of

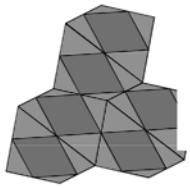


R300

Ukuqonda

Three hundred Rand

National Bank of

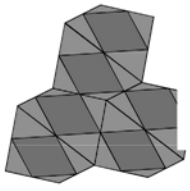


R9

Ukuqonda

Nine Rand

National Bank of

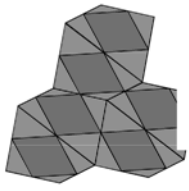


R90

Ukuqonda

Ninety Rand

National Bank of



R5

Ukuqonda

Five Rand

900+200	800+300
900+300	800+400
900+400	800+500
900+500	800+600
900+600	800+700
900+700	800+800
900+800	700+400
900+900	700+500

Term 2 Annexure H (Number bond cards)

700+600	700+700
700+800	700+900
600+500	600+600
600+700	600+800
600+900	500+600
500+700	500+800
500+900	400+700
400+800	400+900

Term 2 Annexure H (Number bond cards)

300+800	300+ 900
100+900	200+800
300+700	700+300
900+100	800+200
400+600	600+400
200+900	500+500

Term 2 Annexure H (Number bond cards)

1900–100	1800–100
1700–100	1600–100
1500–100	1400–100
1300–100	1200–100
1100–100	1000–100
2100–100	2100–200
2100–300	2100–400
2100–500	2100–600

Term 2 Annexure H (Number bond cards)

1900–200	1800–200
1900–300	1800–300
1900–400	1800–400
1900–500	1800–500
1900–600	1800–600
1900–700	1800–700
1900–800	1800–800
1900–900	1800–900

Term 2 Annexure H (Number bond cards)

1700–200	1600–200
1700–300	1600–300
1700–400	1600–400
1700–500	1600–500
1700–600	1600–600
1700–700	1600–700
1700–800	1600–200
1700–900	1600–900

Term 2 Annexure H (Number bond cards)

1500–200	1400–200
1500–300	1400–300
1500–400	1400–400
1500–500	1400–500
1500–600	1400–600
1500–700	1400–700
1500–800	1400–200
1500–900	1400–900

Term 2 Annexure H (Number bond cards)

1300–200	1200–200
1300–300	1200–300
1300–400	1200–400
1300–500	1200–500
1300–600	1200–600
1300–700	1200–700
1300–800	1200–200
1300–900	1200–900

Term 2 Annexure H (Number bond cards)

1100–200	1000–200
1100–300	1000–300
1100–400	1000–400
1100–500	1000–500
1100–600	1000–600
1100–700	1000–700
1100–800	1000–200
1100–900	1000–900

Term 2 Annexure H (Number bond cards)

1900+100	1800+100
1700+100	1600+100
1500+100	1400+100
1300+100	1200+100
1100+100	1000+100
2100+100	2100+200
2100+300	2100+400
2100+500	2100+600
Term 2 Annexure H (Number bond cards)	

1900+200	1800+200
1900+300	1800+300
1900+400	1800+400
1900+500	1800+500
1900+600	1800+600
1900+700	1800+700
1900+800	1800+800
1900+900	1800+900

Term 2 Annexure H (Number bond cards)

1700+200	1600+200
1700+300	1600+300
1700+400	1600+400
1700+500	1600+500
1700+600	1600+600
1700+700	1600+700
1700+800	1600+200
1700+900	1600+900

Term 2 Annexure H (Number bond cards)

1500+200	1400+200
1500+300	1400+300
1500+400	1400+400
1500+500	1400+500
1500+600	1400+600
1500+700	1400+700
1500+800	1400+200
1500+900	1400+900

Term 2 Annexure H (Number bond cards)

1300+200	1200+200
1300+300	1200+300
1300+400	1200+400
1300+500	1200+500
1300+600	1200+600
1300+700	1200+700
1300+800	1200+200
1300+900	1200+900

Term 2 Annexure H (Number bond cards)

1100+200	1000+200
1100+300	1000+300
1100+400	1000+400
1100+500	1000+500
1100+600	1000+600
1100+700	1000+700
1100+800	1000+200
1100+900	1000+900

Term 2 Annexure H (Number bond cards)

848	869	881	449	376	435	718	335
825	301	776	415	713	596	831	696
949	626	450	881	630	957	727	945
393	304	569	643	718	586	723	886
413	477	944	716	646	914	795	917

365	418	637	947	561	367	360	774
720	397	400	358	382	469	545	596
670	864	768	830	949	386	457	668
635	789	510	396	653	905	343	669
995	574	568	496	906	406	572	777

367	766	598	397	747	464	352	668
711	852	780	439	994	894	571	824
362	561	488	567	763	539	404	700
475	742	521	320	329	637	650	471
707	329	662	507	661	699	838	806

714	498	682	713	636	931	720	391
661	656	989	796	361	629	739	327
714	662	806	738	658	972	928	457
990	922	497	630	552	303	480	843
761	502	997	779	331	983	957	418

Term 2 Annexure I (Many 3-digit numbers)

897	940	637	464	847	499	730	670
777	990	334	374	769	447	386	831
985	899	562	650	737	815	401	671
347	927	802	927	671	603	535	363
604	817	929	817	879	814	490	950

340	436	439	801	495	305	746	416
759	551	300	376	364	567	358	756
828	464	907	375	481	711	380	520
763	847	641	978	595	723	709	496
311	472	553	648	604	550	798	531

669	695	647	973	436	905	674	947
562	782	675	945	867	799	564	383
898	690	508	349	435	532	762	535
861	833	908	737	386	981	789	518
798	470	982	546	512	875	554	847

977	431	850	576	639	515	470	810
631	728	721	384	730	875	420	966
883	509	794	710	444	726	877	897
973	572	936	377	366	957	743	688
512	574	387	979	590	367	760	703

Term 2 Annexure I (Many 3-digit numbers)

10×20	10×30
10×40	10×50
10×60	10×70
10×80	10×90
20×20	20×30
20×40	20×50
20×60	20×70
20×80	20×90

Term 2 Annexure K(Multiplication fact cards).

30×20	30×30
30×40	30×50
30×60	10×90
40×20	40×30
40×40	40×50
50×20	50×30
50×40	70×20
80×20	90×20

Term 2 Annexure K(Multiplication fact cards).

7×9	2×3
2×4	2×5
2×6	2×7
2×8	2×9
7×7	7×3
6×7	6×8
6×9	8×9
7×4	7×5

Term 2 Annexure K(Multiplication fact cards).

3×2	3×3
3×4	3×5
3×6	4×2
4×3	7×8
4×4	4×5
5×2	5×3
5×4	7×2
8×2	9×2

Term 2 Annexure K(Multiplication fact cards).

9×3	9×4
9×5	9×6
9×7	9×8
9×9	5×5
8×8	9×9
3×8	3×7
4×9	3×9
4×6	4×7

Term 2 Annexure K(Multiplication fact cards).

4×8	5×6
5×7	5×8
5×9	8×3
6×2	6×3
6×4	8×4
6×5	6×6
8×5	8×6
8×7	7×6

Term 2 Annexure K(Multiplication fact cards).

7×90	2×30
20×4	2×50
20×6	2×70
20×8	2×90
70×7	7×30
60×7	6×80
60×9	8×90
70×4	7×50

Term Term 2 Annexure K(Multiplication fact cards).

3×2	3×30
3×4	3×50
3×6	4×20
4×3	7×80
4×4	4×50
5×2	5×30
5×4	7×20
8×2	9×20

Term 2 Annexure K(Multiplication fact cards).

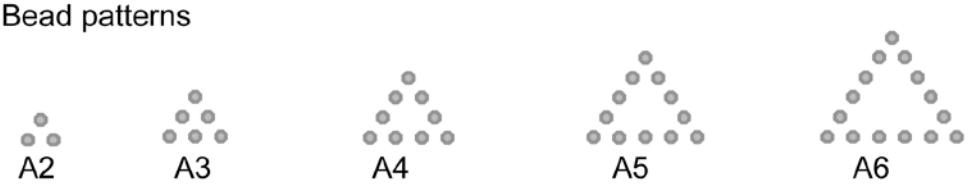
90×3	9×40
90×5	9×60
90×7	9×80
90×9	5×50
80×8	9×90
30×8	3×70
40×9	3×90
40×6	4×70

Term 2 Annexure K(Multiplication fact cards).

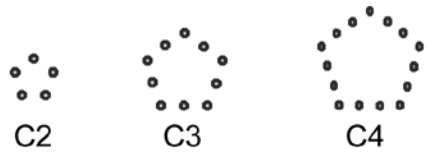
40×8	5×60
50×7	5×80
50×9	8×30
60×2	6×30
60×4	8×40
60×5	6×60
80×5	8×60
80×7	7×60

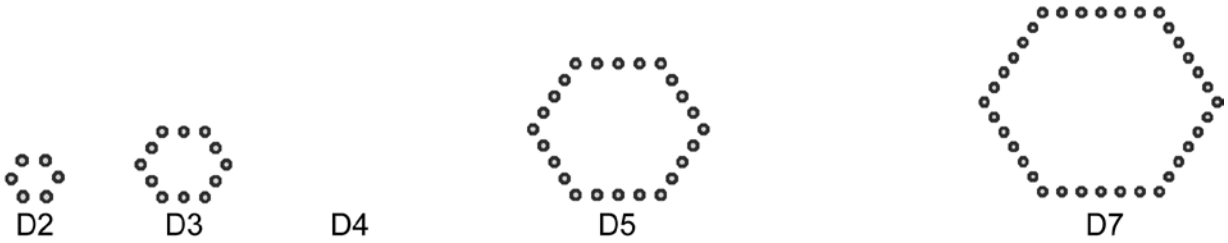
Term 2 Annexure K(Multiplication fact cards).

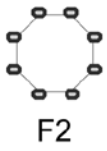
Bead patterns



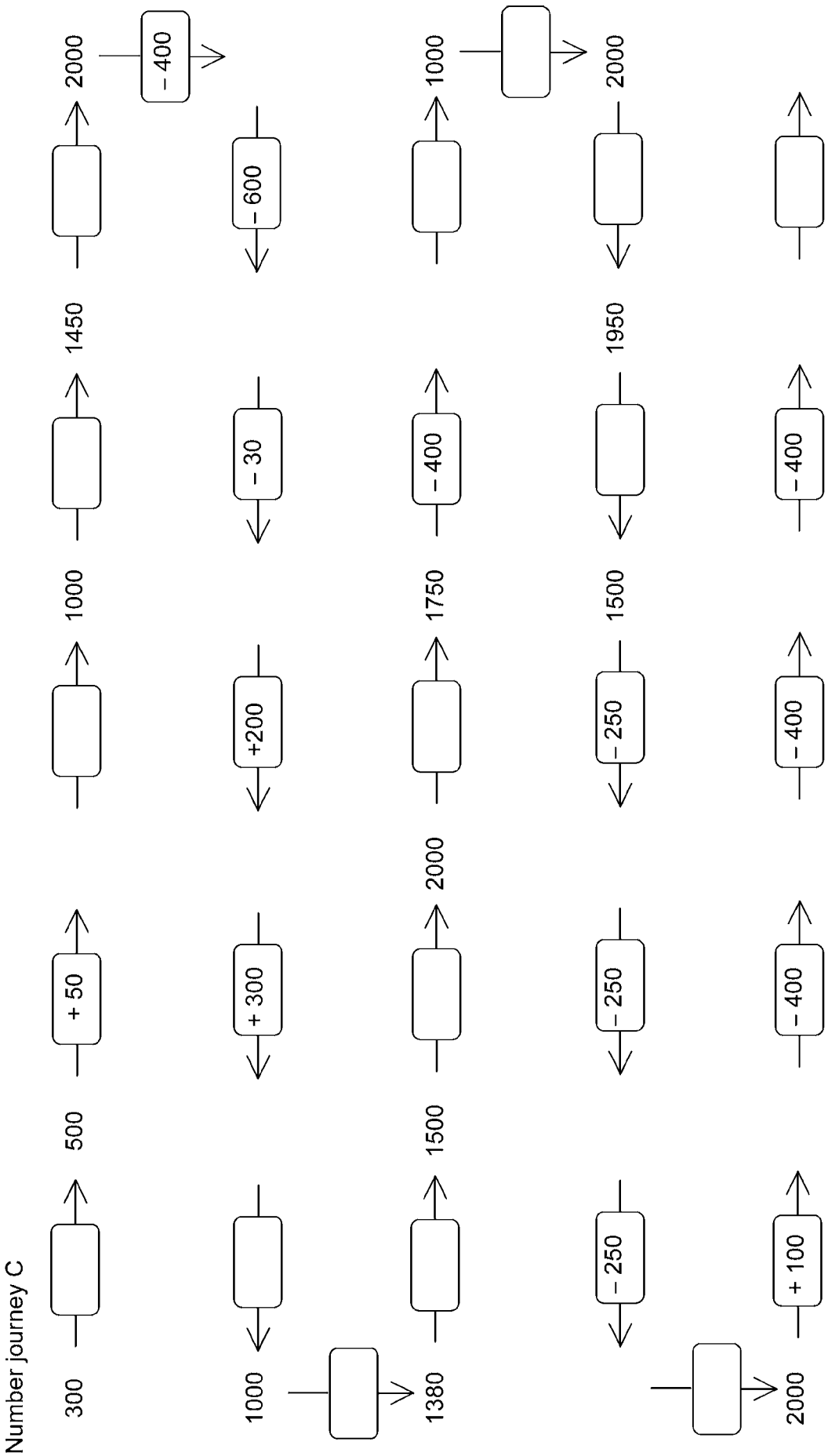






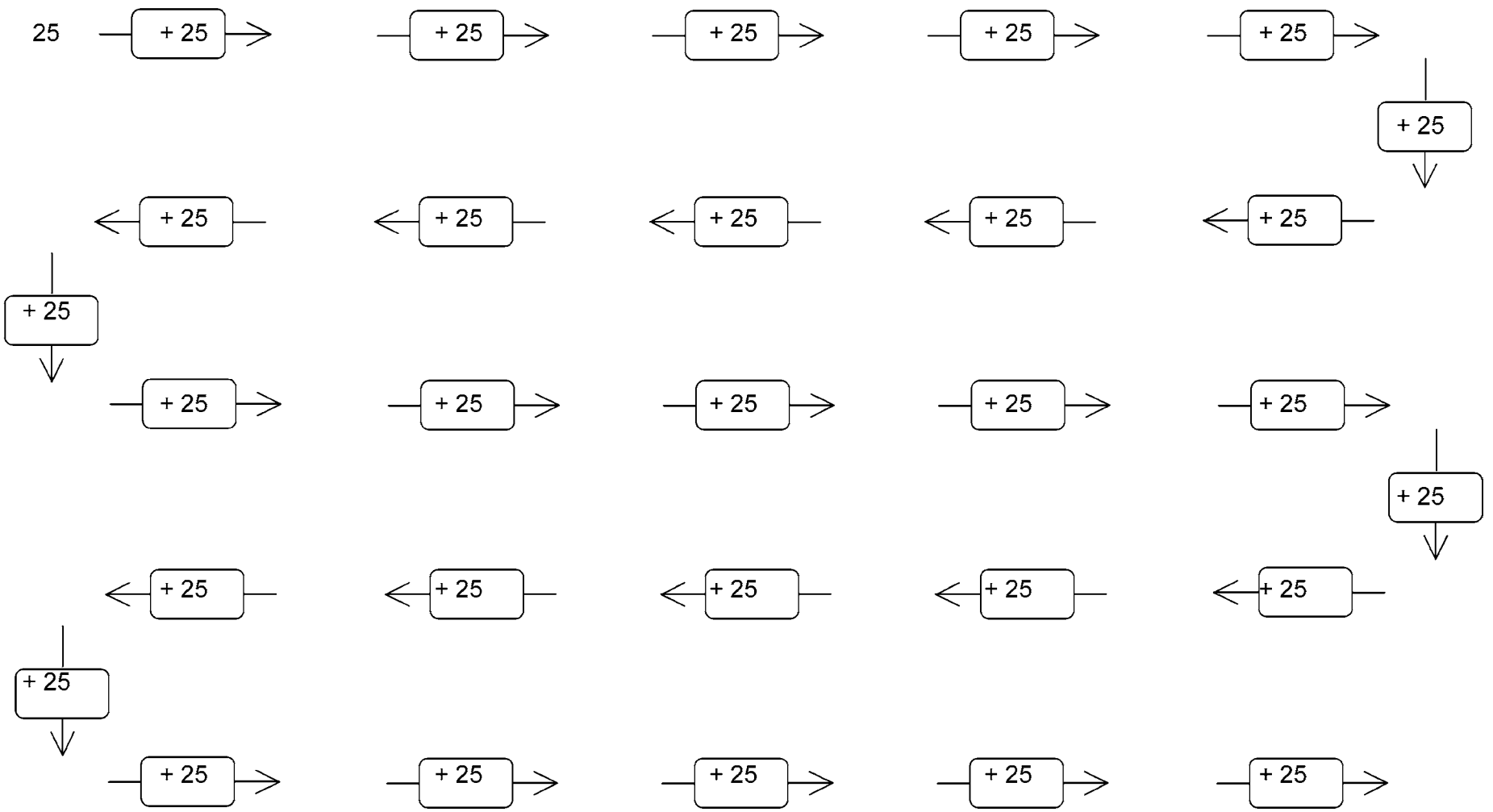


Term 2 Annexure L (Bead patterns)



Term 2 Annexure M (Number journeys series 2)

Number journey D



Term 2 Annexure M (Number journeys series 2)

Term 2 Annexure N (Number journeys series 3)

1744 1756 1346 1570 1400 1692 1393 1282
1756 1094 1844 1252 1194 1862 1564 1367
1045 1468 1205 1326 1232 1317 1198 1138
1140 1036 1906 1213 1417 1696 1430 1161
1041 1690 1399 1809 1948 1667 1744 1499

1822 1622 1212 1345 1210 1994 1407 1642
1426 1586 1551 1550 1019 1147 1060 1993
1634 1071 1830 1278 1934 2000 1575 1499
1021 1490 1256 1161 1628 1081 1412 1411
1482 1510 1318 1739 1405 1742 1925 1585

1301 1888 1621 1706 1684 1481 1496 1910
1136 1573 1042 1144 1277 1896 1455 1316
1441 1831 1815 1594 1877 1826 1894 1602
1397 1366 1309 1510 1179 1130 1863 1912
1937 1975 1533 1843 1666 1122 1197 1907

1672 1750 1432 1591 1872 1581 1592 1402
1461 1928 1243 1850 1551 1921 1303 1844
1778 1686 1360 1194 1591 1773 1278 1033
1308 1487 1610 1286 1745 1557 1864 1299
1137 1535 1094 1815 1565 1943 1202 1061

1197 1784 1348 1519 1775 1912 1754 1826
1100 1016 1576 1404 1206 1366 1827 1223

Term 2 Annexure P (Many 4-digit numbers)

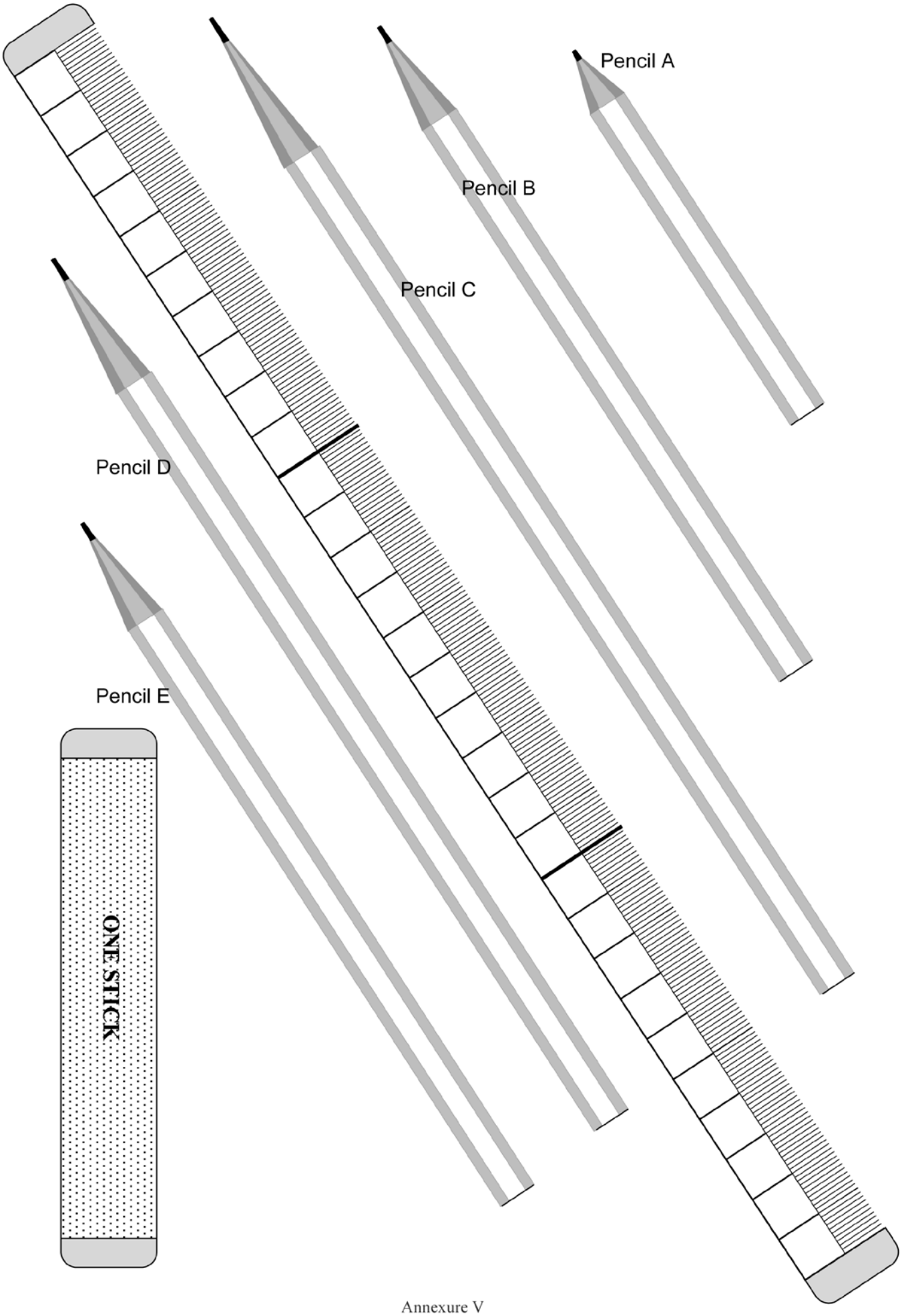
1884 1489 1264 1131 1792 1904 1100 1614
1257 1377 1460 1480 1597 1205 1251 1308
1817 1333 1115 1969 1568 1838 1770 1685

1033 1369 1516 1630 1861 1906 1716 1320
1056 1431 1377 1483 1489 1936 1123 1951
1683 1831 1811 1808 1310 1726 1280 1937
1681 1099 1084 1179 1358 1051 1291 1645
1728 1448 1095 1754 1630 1932 1442 1447

1576 1598 1902 1622 1757 1341 1620 1229
1546 1926 1088 1713 1848 1425 1298 1050
1544 1241 1499 1168 1556 1639 1396 1775
1779 1832 1429 1153 1997 1173 1375 1491
1554 1753 1323 1864 1930 1795 1813 1186

1061 1662 1750 1566 1168 1161 1866 1008
1117 1596 1638 1761 1677 1133 1954 1837
1274 1689 1308 1268 1110 1187 1771 1205
1259 1441 1870 1676 1208 1425 1533 1997
1666 1877 1791 1322 1532 1110 1263 1911

Term 2 Annexure P (Many 4-digit numbers)



Annexure V

Notes:

Notes: