RESOURCE HANDOUT

2019 TRAINING WORKSHOP NO.3

MATHEMATICS

FOUNDATION PHASE

PILO
IMPROVING LEARNER PERFORMANCE

education

Department:
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PROVINCE OF KWAZULU-NATAL

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Just-in-Time Training Workshop
2019: No. 3

Resources Handout

Maths

Jika iMfundo
what I do matters

Endorsed by:

Jika iMfundo: Foundation Phase JIT Workshop 3
Mathematics July 2019
Excerpts and other support material

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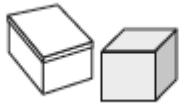
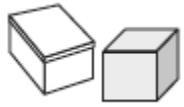
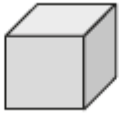
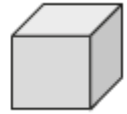
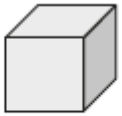
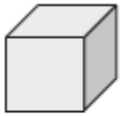
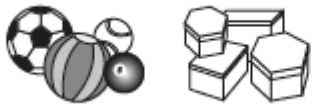
Session 2 Activities: Extracts from the Term 3 Jika iMfundo Dictionary.

box shapes (prisms)	A solid object that has six faces.		okusabhokisi (iphrizimu)	Into ebambekayo esabhokisi enamacala ayisithupha.	
cone	A geometric shape with a round base and a curved surface that tapers to a point.		ikhoni	Isimo eziyisiyingi ezansi bese siba nobuso obugobile.	
cylinder	A figure that is shaped like a can. It has two flat circular faces (sides) and one curved surface.		isilinda	Yisakhiwo esakheke njengekani. Sinezinhlangothi (izingxenye) ezimbili ezendlalekile kanye nolulodwa olugobile.	
face	The flat surface of a 3-D shape. E.g. You can see three of the faces of this prism (box shape).		ubuso	Uhlangothi oluyisicaba lwesimo sikanhlangothintathu. Isb. Ungakwazi ukubona izinhlangothi ezintathu eziyisicaba zesimo esiyibhokisi.	
flat	Something which is not curved. A 3-D object can have flat sides (faces). E.g. The faces (sides) of this cube are all flat.		kuyisicaba	Okuthile okungagobile. Unhlangothintathu angaba nezinhlangothi eziyisicaba. Isb. Izinhlangothi zaleli bhokisi ziyizicaba zonke.	
flat surface	A flat surface can rest on a table and not roll. A shape can slide on a flat surface. See slide/roll.		iphansi eliyisicaba	Into eyisicaba iyakwazi ukuhlala etafuleni ingagingqiki. Isimo siyakwazi ukushelela enaweni eyisicaba. Bheka shelela/gingqika.	
objects 3-D (3-dimensional objects)	Objects such as balls (spheres) and boxes (prisms).		onhlangothi-ntathu (Izinto ezinezinhlangothi ezintathu)	Izinto ezinjengamabhola (izimbulunga) kanye namabhokisi (amaphrizimu).	
prism	A geometric shape that has a base that can vary but the other faces are all rectangles or squares. A cube is a special prism which has all of its faces squares. E.g.		iphrizimu	Umfanekiso osazibalomdwebo onengaphansi okungenzeka lingafani kodwa amanye amacala onke angonxande noma izikwele. Isikwelebhokisi siyiphrizimu ekhethekile esinawo onke amacala aso ayisikwele. Isb.	
pyramid	A geometric shape that has a base that can change but all of the other faces are triangles.		iphiramidi	Isimo esiyisibalo esinephansi elinokuhlukahlukana kodwa ezinye izingxenye ziwunxantathu.	

rectangle	A shape with 4 straight sides and 4 square corners. Opposite sides are equal.	unxande	Isimo esinezinhlangothi ezi-4 eziqondile kanye namakhona ama-4. Amabili abhekene ayalingana.
roll or slide	This tin rolls on the curved surface but it slides on the flat surface of the can.	ukugingqika noma ukushelela	Leli thini liyagingqika uma lilele ngohlangothi olugobile kodwa liyashelela uma lilele ngohlangothi oluyisicaba.
shape	Form or outline. E.g.	isimo	Into enesakhiwo esithile. Isb
shapes 2-D (2-dimensional shapes)	Shapes such as triangles, squares, rectangles, circles, etc. E.g.	onhlangothi-mbili (imifanekiso enhlangothi-mbili)	Yizimo ezifana nonxantathu, izikwele, onxande, iziyingi, njll. Isb.
sphere	A round 3-D object. The mathematical name for a ball. See ball shape.	indilinga	Unhlangothi-ntathu oyindilinga. Igama elisetshenziswa ezibalweni elisho ibhola. Bheka isimo sebhola.
square	A shape with 4 straight sides which are equal in length and 4 square corners.	isikwele	Isimo esinezinhlangothi ezi-4 eziqondile kanye namakhona ayizikwele ama-4.
straight sides	An edge of a shape that is not curved. E.g. A square has straight edges.	izinhlangothi eziqondile	Uhlangothi oluqondile kusho ukuthi alugobile, kodwa oluyisiyingi lugobile. Isb. Isikwele sinezinhlangothi eziqondile.
straight sides/ round sides	A straight side is not curved and a round side is curved. E.g. A square has straight sides and a circle has round sides.	izinhlangothi eziqondile/ izinhlangothi eziyindilinga	Uhlangothi oluqondile kalugobile kanti lunohlangothi olugobile. Isb. Isikwele sinezinhlangothi eziqondile kanti isiyingi sinezinhlangothi ezigobile.
surface	The faces of a shape make up its surface – this is the outside area of a 3-D object. A surface can be flat or curved. E.g. A sphere has one curved surface, a cone has one curved surface and one flat surface (or face).	uhlangothi ingaphandle lento	Izinhlangothi zesimo ziwubuso besimo leso – kanti lolu wuhlangothi olungaphandle lukanhlangothintathu (3-D). Uhlangothi lungaqonda noma lugobe. Isb. Indilinga inohlangothi olulodwa olugobile, ikhowuni inohlangothi olugobile kanye noluyisicaba.

Session 2 Activity 5: Extracts from the Term 3 Jika iMfundo Lesson plans.

Grade 1 Lesson 37

Activity 1: Learners work in groups

Give each group of learners some balls and boxes of different sizes and colours.
The following are just examples, you can use any colours that you can find for the balls and boxes and talk about the sizes in relation to the objects that you have collected.
Ask learners to:

- *Show me a ball smaller than the green ball.*
- *Show me a box smaller than the pink box.*
- *Show me a ball bigger than the blue ball.*
- *Show me a box bigger than the red box.*
- Repeat with similar questions.

Activity 2: Whole class activity

Put pictures of boxes and balls of various sizes and colours on the board.
Ask learners questions such as the questions below. Adapt these questions to the pictures that you have found – refer to the colour and size of the shapes in your pictures.

- Compare pairs of objects:
  - *Which is bigger: the purple box or the green box?*
  - *Which is bigger: the orange ball or the blue ball?*
  - *What is smaller than the blue ball?*
  - *What is smaller than the pink box?*
- Ask learners to give you other examples of objects smaller than: the orange box; the pink box; the orange ball, etc.
- Ask learners to give you other examples of objects bigger than: the green ball; the yellow box; the green box, etc.
- Remind learners that when we compare two objects we say 'bigger' or 'smaller'.
- Compare three (or more) objects:
- *Which is the biggest object?*
- *Which is the smallest object?*
- Remind learners that when we compare three or more objects, the one that is bigger than all of the objects is the biggest object. (Similarly for the smallest object.)

Grade 2 Lesson 16

Activity 1: Whole class activity

Play this game with the learners, using objects in your class shaped like cylinders, balls and boxes. (If you have enough time (and objects), the learners can play the game in groups of four.)

- Call two learners to the front of the class.
- Blindfold them.
- Give each one of them same object, either ball- or box-shaped.
- They now feel what the object feels like.
- They explain to the other learners what they feel. (They should talk about the type of surfaces they can feel – are they flat or curved? Is the object big/small?)
- See which one of the two learners can identify first if it is a cylinder, a ball- or a box-shaped object.
- Tell learners the mathematical names of the objects – cylinders, spheres and prisms.
- Repeat the game, allowing as many as possible of the learners to participate and identify 3-D objects.

Grade 3 Lesson 28

Activity 2: Learners work individually

- Draw a triangle. Draw three more, but all should look different. Discuss with your partner what is different about each one. (The differences could be in the size and/or orientation of the shapes.)
- Draw a rectangle. Draw three more, but all should look different. Discuss with your partner what is different about each one. (The differences could be in the size and/or orientation of the shapes.)
- Draw a square. Draw three more, but all should look different. Discuss with your partner what is different about each one. (The differences could be in the size and/or orientation of the shapes.)
- Draw a circle. Draw three more, but all should look different. Discuss with your partner what is different about each one. (The differences could be in the size of the shapes. Circles do not look different if their 'orientation' is changed. Discuss this with learners.)
- When all learners have finished this activity you could call the whole class together to have a general discussion about the findings in relation to different shapes that learners drew.

Grade 3 Lesson 39

Activity 1: Whole class activity

Revise names and properties of the following shapes (hold up a model of each one as you talk about it, pointing to the faces, edges and vertices as you speak about them):

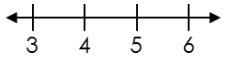
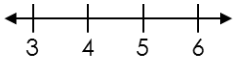
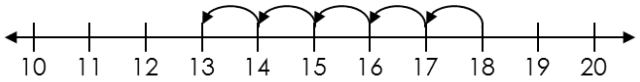
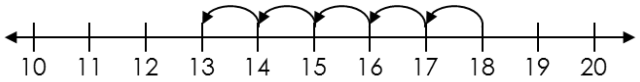
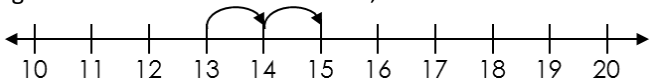
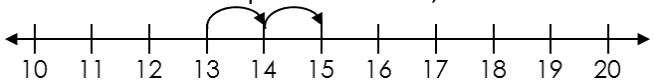
- Pyramid: All the surfaces are flat, has a pointed top.
- Cylinder: Two flat round surfaces of the same size, one curved face.
- Prism: Base and top are the same size and shape, all faces are flat.
- Cone: One flat round surfaces, one curved face, and pointed top.
- Sphere: Curved all around, one surface.

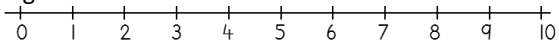
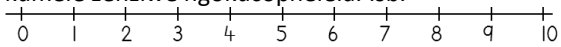
Activity 2: Whole class activity

Hold up each 3-D object and discuss the shapes that make the surfaces of the object. Discuss what kind of shapes the surfaces are and whether the surfaces are curved or flat.

- *Which shapes make up the surfaces of a box/cube?* (Squares; flat)
- *Which shapes make up the surfaces of a cylinder?* (Circles and rectangles; circles are flat, rectangles are rounded/curved)
- *Which shapes make up the surfaces of a pyramid?* (Triangles, square/rectangle/triangles; all flat)
- *Which shapes make up the surfaces of a cone?* (Circles, semicircles; semicircles are curved and one circle is flat)
- *Which shapes make up the surfaces of a prism?* (Rectangles, triangles, rectangles, squares; all flat)

Session 3 Activities: Extract from the Mathematics Dictionary - Number patterns (Grade 1 2 3)

Maths word	Explanation/diagram	Isihumusho	Umdwebo/incazelo
after (a number)	The number that comes next in a pattern. E.g. 5 comes after 4 if you are counting up.	emva (kwenombolo)	Inombolo elandelayo ephethinini. Isb. U-5 uza emva kuka-4 uma ubala ukhkuphuka.
backwards	In the reverse of the usual way. E.g. when you count backwards the numbers get smaller: 10, 9, 8, 7, …	ukuhlehla	Ukungayi lapho uvame ukuya khona. Isb. Uma ubala uhlehla izinombolo ziya ngokuya zincipha: 10, 9, 8, 7, …
before	A number that comes in front of another number, in the counting sequence. E.g. 5 comes *before* 6.	ngaphambili	Inombolo engaphambi kwenye inombolo, uma kubalwa. Isb. Isi-5 siza ngaphambili kwesi-6.
between	A number or numbers in the middle of two numbers. E.g. 4 and 5 are between 3 and 6. 	phakathi	Yinombolo noma izinombolo eziphakathi kwezinye izinombolo. Isb. Izinombolo 4 nenombolo 5 ziphakathi kwenombolo 3 no-6. 
count	Say numbers in the correct numerical order.	bala	Bala utsho amanani ngokokulandelana kwawo.
counting back	Counting back means counting down (backwards) from a given number. To subtract you can count back from the bigger number to the smaller number. E.g. 18 – 5 = 13. Count back: 18 … 17, 16, 15, 14, 13 	ukubala uhlehle	Ukubala uhlehle kusho ukubala uye phansi (emuva) usuke enombolweni oyinikiwe. Uma ususa ubala usuke enombolweni enkulu uye kwencane. Isb. 18 – 5 = 13. Bala uhlehle: 18 … 17, 16, 15, 14, 13 
counting in 10s, 50s, 100s	When you count in groups from a given number. E.g. count in 10s from 15: 15, 25, 35, 45, 55, 65 Count in 50s to 200: 50, 100, 150, 200.	ukubala ngama-10 50 100	Uma ubala ngamaqoqo usukela enombolweni onikezwe yona. Isb. Bala ngama-10 usuke e-15: 15, 25, 35, 45, 55, 65. Bala ngama-50 usukele ema-50 uye ema-200: 50, 100, 150, 200
counting on	Counting on means counting forwards from a given number. To add you can count on. Usually you count on from the bigger number. E.g. 13 + 2 = 15. Count on: 13 … 14, 15 	ukuqhubeka ubale	Ukubala uqhubeke kusho ukubala uye phambili usuke enombolweni oyinikiwe. Uma uhlanganisa ufana nomuntu obala aqhubeke. Ngokujwayelekile ubala usuke enombolweni enkulu. Isb. 13 + 2 = 15. Bala uqhubeke: 13 … 14, 15 
describe (a pattern)	To tell or write about a pattern to explain how the pattern is made up. E.g. 3, 5, 7, 9, … This pattern is made by starting at 3 and then adding 2 every time	chaza (iphethini)	Ukusho iphethini noma ukubhala ngalo ukuze kuchazwe ukuthi lakheke kanjani. Isb. 3, 5, 7, 9, … Ieli phethini lakhiwe ngokuqala ngo-3 bese kwengezwa oku-2 njalo nje kuze kufikwe endaweni elandelayo ephethinini.

Maths word	Explanation/diagram	Isihumusho	Umdwebo/incazelo
	to get to the next term in the pattern.		
extend (a pattern)	To add terms (numbers or shapes) to a given pattern. To do this you need to find the rule for the pattern. E.g. Extend the pattern by giving the next 3 terms (numbers) in the pattern: 4, 9, 14, … Rule: add 5 each time to get the next term. Extended pattern: 4, 9, 14, 19, 24, 29…	nweba (iphethini)	Ukwengeza iphethini. Kumele uthole umthetho olandelwe ukuze ukwazi ukwenza ukunweba ngale ndlela. Isb. Nweba iphethini ngokunikeza amanye amabanga alo ama-3 kulo lelo phethini: 4, 9, 14, … Umthetho: nweba ngoku-5 njalo nje ukuze ufinyelele ebangeni elilandelayo Nweba leli phethini: 4, 9, 14, 19, 24, 29…
interval	The gap between – it could be a time interval or an interval in numbers (the size of the gap in a number pattern. e.g. There is an interval of 1 hour between 3 o'clock and 4 o'clock. The interval in the number pattern 15, 30, 45, 60, … is 15.	phakathi nesikhathi	Siyaba nesikhathi esiphakathi kwezehlakalo ezimbili. Njengokuthi uma kunomcimbi owenzekayo, kuba nomculo phakathi kwenkulumo yesikhulumi kanye nenye inkulumo yesikhulumi.
multiple	The product when you multiply one whole number by another whole number. e.g. 6 is a multiple of 2; 25 is a multiple of 5.	okuphindaphindeka ngenombolo ethile	Umphumela wokuphindaphinda inombolo ephelele ngenye inombolo ephelele. Isb. Oku-6 kuphindaphindeka ngoku-2; 25 kuphinaphindeka ngoku-5.
multiples of 2	The products when you multiply whole numbers by 2. E.g. 2, 4, 6, 8, 10, 12, 14 are the first seven multiples of 2.	okuphindaphindeka ngo-2	Umphumela wokuphindaphinda izinombolo eziphelele ngo-2. Isb. 2, 4, 6, 8, 10, 12, 14 yizinombolo zokuqala eziyisi-7 eziphindaphindeka ngo-2.
multiples of 5	The products when you multiply whole numbers by 5. E.g. 5, 10, 15, 20, 25, 30, 35 are the first seven multiples of 5.	okuphindaphindeka ngo-5	Umphumela wokuphindaphinda izinombolo eziphelele ngo-5. Isb. 5, 10, 15, 20, 25, 30, 35 yizinombolo zokuqala eziyisi-7 eziphindaphindeka ngo-5.
number line	A number line is a line on which numbers can be placed, according to their value. The gaps on the number line must be drawn accurately. E.g: 	umugqa wezinombolo	Umugqa wezinombolo wumugqa onezinombolo ezibhalwe kuwo zalandelana ngokwezikhundla zazo. Izikhala ezinombolweni kumele zenziwe ngokucophelela. Isb. 
number pattern/ numeric pattern	A number / numeric pattern is another name for a number sequence or pattern.	Iphethini lezinombolo	Iphethini lezinombolo ngelinye igama lezinombolo ezilandelana ngandlela thile noma ezakha iphethini elithile.
number sequences	Number sequences are patterns of numbers that follow a rule. E.g. 2, 4, 6, 8, 10, 12, … are the even numbers, they are a sequence of numbers	Ukulandelana kwezinombolo	Lawa ngamaphethini ezinombolo alandela umthetho othile. Isb. 2, 4, 6, 8, 10, 12, … yizinombolo ezingelona ugweje ezilandelanayo.

Session 3 Activity 2: 1–200 number board

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

Session 3 Activity 3: Lesson plan extracts

Grade 1 Term 3 Lesson 29

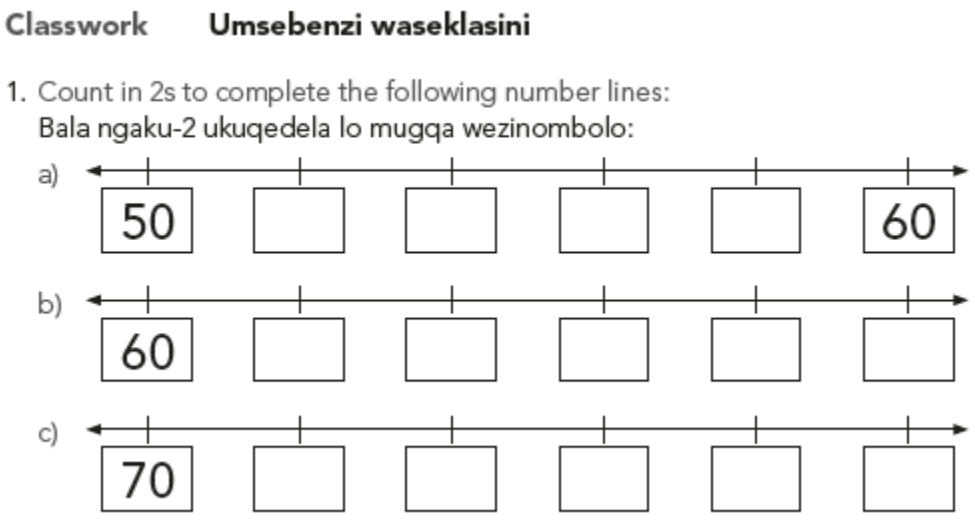
Lesson vocabulary: How many, groups, lots of, add, addition, plus, equals, remainders, number patterns, number sequences.

Activity 1: Learners work in groups

Give each group of learners a 1–80 number board.

- Ask learners to place counters on 10, 20, 30, 40, 50, 60, 70, 80.
- Encourage them to point at the numbers and count in tens while they do this (10, 20, 30, 40, 50, 60, 70, 80).
- Ask: *What multiples have we just shown on the number board*? (10s, or the multiples of 10)
- Ask learners to place counters on 2, 4, 6, 8 … 50.
- Encourage them to point at the numbers and count in twos (2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50).
- Ask: *What multiples have we just shown on the number board*? (2s, or the multiples of 2)
- Discuss: *We have looked at patterns of 10s and 2s on the number board. What did you notice?* (Answers may vary but encourage learners to see that some of the multiples of 2 are also multiples of 10)

Classwork Activity



Grade 2 Term 3 Lesson 23

Lesson vocabulary: Number patterns, number sequences, multiples, forwards, backwards, addition, subtraction, even numbers, odd numbers, copy, extend.

Activity 1: Learners work in pairs

- Learners use a 0–200 number board.
- Ask them to count in 2s and place a counter on each number they count.
- They can put their fingers underneath each multiple as they count using the counters to guide them.
- Count backwards in multiples of 2 from 180 to 0, using the number line and pointing to the numbers as they count.
- Let learners now count in 2s, counting from any given number, such as 37. (The sequence they will count is: 37, 39, 41, 43, 45, …)
- Remind learners that when counting in multiples of 2, we are counting even numbers – they all end on a multiple of 2. (Numbers that are not even are called odd numbers. Odd numbers are not multiples of 2.)
- Ask learners to show you which numbers will be between these pairs of numbers, while counting in twos:
  - 0 and 22 (2, 4, 6, 8, 10, 12, 14, 16, 18, 20)
  - 70 and 98 (72, 74, 76, 78, 80, 82, 84, 86, 88, 89, 90, 92, 94, 96)
  - 137 and 157 (139, 141, 143, 145, 147, 149, 151, 153, 155)
  - Etc.

Grade 3 Term 3 Lesson 20

Lesson Vocabulary: Number pattern, family, predictable, increasing, decreasing, multiple, regular pattern, copy, extend, describe, before, after, left, right, sequence.

Activity 1: Whole class activity.

- Write down these numbers on the board. Ask: *Can you explain/describe each pattern?*
  - 210, 220, 230, 240, 250, 260 (10s pattern)
  - 45, 50, 55, 60, 65, 70 (5s pattern)
  - 400, 402, 404, 406, 408, 410 (2s pattern)
- Ask some learners to make up their own patterns. Ask them to describe how their patterns grow. They can make patterns that involve multiples of 2, 3, 4, 5, 10, 25, 50 or 100. (Allow about five learners to do this.)
- Now look at these numbers. *They may not be in order and all the numbers in the sequence might not be there. Which one does not belong to the pattern? Why do you say that?*
  - 210, 220, 203, 240, 250, 260 (203 does not belong to the 10s pattern)
  - 365, 375, 385, 397, 405 (397 does not belong to the 5s pattern)
  - 540, 250, 580, 130, 755 (755 does not belong to the 10s pattern)
  - 65, 44, 70, 55, 60, 50 (44 does not belong to the 5s pattern)
  - 400, 401, 420, 438, 428, 310 (401 does not belong to the 2s pattern)

Session 3 Activity 5: CAPS Term 3 overview extract

CAPS Grade 1 Term 3

Copy, extend and describe

Copy, extend and describe simple number sequences to at least 80. Sequences should show counting forwards and backwards in:

- 1s from any number between 1 and 80

Counting forwards in:

- 10s from any multiple of 10 between 0 and 80
- 5s from any multiple of 5 between 0 and 80
- 2s from any multiple of 2 between 0 and 80

Create and describe own patterns

- Create and describe own number patterns

CAPS Grade 2 Term 3

Copy, extend and describe

Copy, extend and describe simple number sequences to at least 180. Sequences should show counting forwards and backwards in:

- 1s from any number between 0 and 180
- 10s from any multiple of 10 between 0 and 180
- 5s from any multiple of 5 between 0 and 180
- 2s from any multiple of 2 between 0 and 180
- 3s from any multiple of 3 between 0 and 180
- 4s from any multiple of 4 between 0 and 180

Create own number patterns

CAPS Grade 3 Term 3

Copy, extend and describe

Copy, extend and describe simple number sequences to at least 750. Sequences should show counting forwards and backwards in:

- the intervals specified in Grade 2 with increased number ranges
- 20s,25s, 50s,100s to at least 1 000

Create and describe own number patterns