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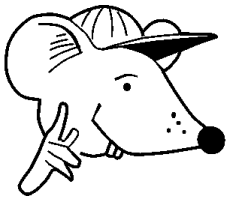
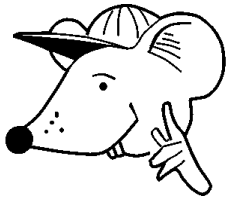


MATHEMATICS



N.S. Yr. 4 P.16

Extend number sequences by counting on and back

Equipment

Paper, pencil, ruler.
Number squares.
Calculator for extension work.

MathSphere

Concepts

Children should be able to understand, read and write the following terms:

Next, consecutive, sequence, predict, continue, rule.

They should be able to count on in 2s, 3s, 4s, and 5s to about one hundred and then count back. A 1 - 100 number line is really useful for this kind of work, or a number square.

It is important that children learn **to count on and back from different starting points** i.e. do not always start counting from 1. It is not as easy as it sounds when the starting point is unfamiliar:

e.g. count on in 4s from 37

Constant practice out loud is very valuable!

The series of numbers should be recognised as a **SEQUENCE** which can be continued and further numbers in the sequence can be **PREDICTED**.

From this a **RULE** can be made for the sequence. At first this rule will be in words only. In later years these rules can be written in algebra.

Whilst calculators are not included in the Numeracy Strategy for this module, nevertheless they are very useful. For example, they can be made into an 'add 5 machine' by carrying out the following instructions:

Enter [5] [+] [+] [=]

Then enter the starting number eg [27] and keep pressing [=]

(Don't press anything else - no extra add signs or clear.)

The calculator can also be made into a 'subtract 5' machine in just the same way. It is a good idea to use the calculator and call out the next number before pressing the = sign, seeing how quickly counting on and counting back can be achieved.

(Note: this may not work for some calculators)

Fill in the missing numbers in these sequences:

1. 53, 58, 63, 68, ☐, ☐

2. 49, 53, 57, 61, ☐, ☐

3. 39, 42, ☐, 48, ☐, 54

4. 58, 62, 66, ☐, ☐, ☐

5. 47, 42, 37, ☐, 27, ☐

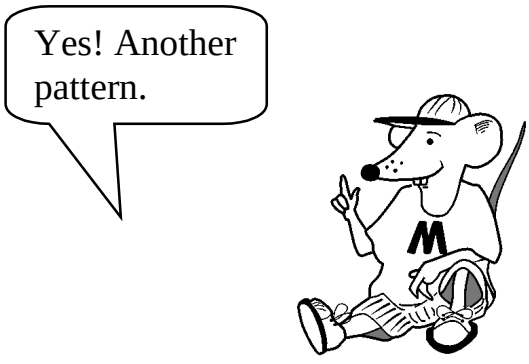
6. 99, 96, ☐, 90, ☐, 84

7. ☐, 33, 29, 25, ☐, 17

8. ☐, ☐, 87, 85, 83, 81

9. Take a 6 x 6 square. Starting at 1 count on in twos. Circle or colour the numbers you land on.

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



10. What do you notice?

If you went on, would 45 be in your sequence? How do you know?

Fill in the missing numbers in these sequences:

1. 55, 53, 51, 49, ☐, ☐

2. 21, 26, 31, 36, ☐, ☐

3. 5, 9, ☐ 17, ☐, 25

4. 67, 70, 73, ☐, ☐, ☐

5. 8, 11, 14, ☐, 20, ☐

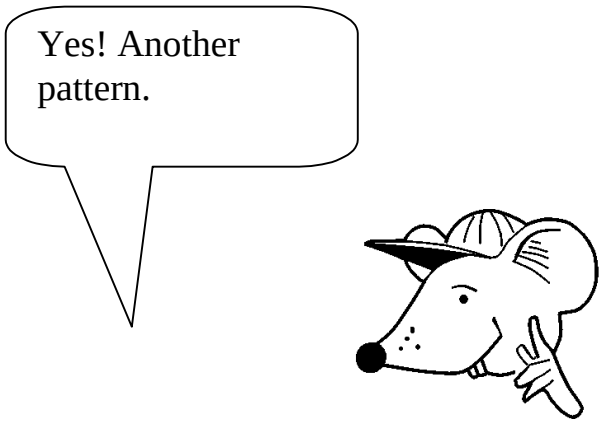
6. 42, 39, ☐, 33, ☐, 27

7. ☐, 99, 94, 89, ☐, 79

8. ☐, ☐, 21, 19, 17, 15

9. Take a 6 x 6 square. Starting at 1 count on in threes. Circle or colour the squares. What do you notice?

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



10. If you started at 5 and counted on in threes would you get a similar pattern? How is it different?

Number sequences

Put the next two numbers into these sequences. Then say what the rule is for the sequence.

Example: 3, 6, 9, 12, *15* *18*

Rule: ***The numbers are going up in threes***

1. 9, 13, 17, 21, ☐ ☐

Rule……

2. 27, 32, 37, 42, ☐ ☐

Rule……..

3. 81, 85, 89, 93, ☐ ☐

Rule……..

4. 67, 69, 71, 73, ☐ ☐

Rule…….

5. 89, 93, 97, 101, ☐ ☐

Rule…….

6. 97, 95, 93, 91, ☐ ☐

Rule…….

7. 42, 39, 36, 33, ☐ ☐

Rule…….

8. 77, 73, 69, 65, ☐ ☐

Rule …….

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Number sequences

Put the next two numbers into these sequences. Then say what the rule is for the sequence.

Example: 5, 9, 13, 17, *21* *25*

Rule: ***The numbers are going up in fours***

1. 10, 15, 20, 25, ☐ ☐

Rule……

2. 87, 90, 93, 96, ☐ ☐

Rule……..

3. 34, 38, 42, 46, ☐ ☐

Rule……..

4. 89, 91, 93, 95, ☐ ☐

Rule…….

5. 103, 99, 95, 91, ☐ ☐

Rule…….

6. 27, 22, 17, 12, ☐ ☐

Rule…….

7. 31, 28, 25, 22, ☐ ☐

Rule…….

8. 103, 101, 99, 97, ☐ ☐

Rule……

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**

1. On a 1- 100 number square start at 4 and count on in fours. Circle or colour each number you land on.

2. What do you notice? Is there a pattern? Describe the pattern.

3. Practice counting forwards and backwards in fours.

4. On the same grid, starting at 5, count on in fives. Circle or colour (in a different colour) each number you land on.

5. What do you notice? Is there a pattern? Describe the pattern.

6. Write down the numbers that you have shaded twice?

7. What can you say about the pattern of numbers that you have shaded twice?

8. Take another number square and starting with a different number (eg 2), repeat the above. Practice counting on and back from this new starting position.

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**

1. On a 1- 100 number square start at 3 and count on in threes. Circle or colour each number you land on.

2. What do you notice? Is there a pattern? Describe the pattern.

3. Practice counting forwards and backwards in threes.

4. On the same grid, starting at 2, count on in twos. Circle or colour (in a different colour) each number you land on.

5. What do you notice? Is there a pattern? Describe the pattern.

6. Write down the numbers that you have shaded twice?

7. What can you say about the pattern of numbers that you have shaded twice?

8. Take another number square and starting with a different number (eg 1), repeat the above. Practice counting on and back from this new starting position.

For this work you will need a calculator.

Enter [2] [+] [+] [=]

4 may well come up - ignore this - do not press anything!

Then enter the starting number [5] and keep pressing [=]

(Don't press anything else - no extra add signs or clear.)

1. Write down the answers that you get, up to 27.

2. Write, in words, what is happening as the sequence goes on.

3. Predict and write down what the next three numbers in the sequence, after 27, will be. Write them down. Check on the calculator to see if you are correct.

4. Clear the calculator and repeat the above, but enter 4 instead of 2.

i.e. Enter [4] [+] [+] [=]

Then enter the starting number [3] and keep pressing [=]

5. Write down the answers that you get, up to 23.

6. Write in words what is happening as the sequence goes on.

7. Predict and write down what the next three numbers in the sequence, after 23, will be. Write them down. Check on the calculator to see if you are correct.

8. Make your calculator into an add 5 machine. Start at 0 and keep pressing [=] sign until you reach 100. How many times did you have to press the sign?

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For this work you will need a calculator.

Enter [2] [-] [-] [=]

0 may well come up - ignore this - do not press anything!

Then enter the starting number [95] and keep pressing [=]

(Don't press anything else - no extra add signs or clear.)

1. Write down the answers that you get, down to 77.

2. Write, in words, what is happening as the sequence goes on.

3. Predict and write down what the next three numbers in the sequence, after 77, will be. Write them down. Check on the calculator to see if you are correct.

4. Clear the calculator and repeat the above, but enter 3 instead of 2.

i.e. Enter [3] [-] [-] [=]

Then enter the starting number [73] and keep pressing [=]

5. Write down the answers that you get, down to 61.

6. Write in words what is happening as the sequence goes on.

7. Predict and write down what the next three numbers in the sequence, after 61, will be. Write them down. Check on the calculator to see if you are correct.

8. Make your calculator into a subtract 5 machine. Start at 100 and keep pressing [=] sign until you reach 0. How many times did you have to press the sign?

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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

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

Answers

Page 3
1. 73, 78 **2.** 65, 69 **3.** 45, 51 **4.** 70, 74, 78 **5.** 32, 22 **6.** 93, 87
7. 37, 21 **8.** 91, 89
2. 3 columns - only numbers ending in 0, 2, 4, 6, 8 included. No - 45 does not end in 0, 2, 4, 6 or 8.

Page 4
1. 47, 45 **2.** 41, 46 **3.** 13, 21 **4.** 76, 79, 82 **5.** 17, 23 **6.** 36, 30
7. 104, 84 **8.** 25, 23
9. 2 columns coloured. One column odd, the other even.
10. Yes, but different columns coloured.

Page 5
1. 25, 29 numbers are going up in 4s
2. 47, 52 numbers going up in 5s
3. 97, 101 numbers going up in 4s
4. 75, 77 numbers going up in 2s
5. 105, 109 numbers going up in 4s
6. 89, 87 numbers going down in 2s
7. 30, 27 numbers going down in 3s
8. 61, 57 numbers going down in 4s

Page 6
1. 30, 35 numbers going up in 5s
2. 99, 102 numbers going up in 3s
3. 50, 54 numbers going up in 4s
4. 97, 99 numbers going up in 2s
5. 87, 83 numbers going down in 4s
6. 7, 2 numbers going down in 5s
7. 19, 16 numbers going down in 3s
8. 95, 93 numbers going down in 2s

Page 7
2. Many patterns might be described eg alternate tens, diagonal lines, every other number etc.
5. two vertical lines, numbers ending in 5 and 0
6. 20, 40, 60, 80, 100
7. all tens, going up in 20s etc

Page 8
2. variety of answers - diagonal lines, every third square etc
5. 5 vertical columns - even numbers only etc
6. 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96
7. going up in sixes - six times table etc

Page 9
1. 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27 **2.** going up in twos - odd numbers etc
3. 29, 31, 33 **5.** 3, 7, 11, 15, 19, 23
6. Going up in 4s - alternate odd numbers **7.** 27, 31, 35 **8.** 20