


Grade 4 Mathematics

Patterns, Relations, and Functions: Lesson 6

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students, will have an arrow symbol () by them.

Purpose of Lesson 6:

- In this lesson, the tutor and the students will
 - ✓ find patterns shown in a hundreds chart.

Equipment/Materials Needed:

- Copies of Student Sheet 119
- Paper and pencils
- Chalkboard
- Crayons or markers (optional)

Preparations before beginning Lesson 6:

- Run one copy of Student Sheet 119 for each student.
- Have paper and pencils available.
- Have crayons or markers available. Students can shade in the squares with pencils, but color is much more effective.
- You should cover Lesson 16 of Number Relations on multiples before beginning this lesson.

Lesson 6: Patterns

Say:

In Lesson 16 of Number Relations, you listed multiples of numbers. In this lesson, you will look at many patterns in the multiples of numbers.

 Give students Student Sheet 119.

Say:

Shade numbers in each hundreds chart using the multiple given. Remember, you say the multiples of a number when you skip count by that number.

What patterns do you see in the multiples of 2? (These are some patterns that you should make sure the students see: only even numbers are shaded; every other column is shaded; the ones digit is 2, 4, 6, 8, or 0; every other number is colored.)

What patterns do you see in the multiples of 3? [In the rows, I left two spaces uncolored, then I colored one space, I left two spaces uncolored, etc. The same coloring scheme happens in the columns. Diagonals are shaded. In the diagonals, when viewed from right to left, the tens digit increases and the ones digit decreases. The sum of the digits of each number shaded can be divided evenly (is divisible) by 3.]

What patterns do you see in multiples of 8? (The ones digit is even, 2, 4, 6, 8, or 0. I see diagonals. I skip 3 in every column. Not many numbers are shaded.)

What patterns do you see in the multiples of 7? (The ones digit can be any number. There are no more than two numbers shaded in any row or column.)


What patterns do you see in the multiples of 4? (The ones digit is either 2, 4, 6, 8, or 0. This pattern was the same as the multiples of 2 and 8. In rows, I shaded every fourth number. In columns, I shaded every other number. In a diagonal, going from right to left, the tens digit increases by one and the ones digit decreases by 2.)

What patterns you see in the multiples of 5? (Only two columns were shaded. The ones digit is always 5 or 0. As I go down a column, the tens digit increases by one and the ones digit stays the same.)

What patterns do you see in the multiples of 6? (The ones digit is 2, 4, 6, 8, or 0. In rows, I shade every sixth number. In columns, every third number is shaded. The sum of the digits of any shaded number is divisible by three. Only even numbers are shaded.)

What patterns do you see in the multiples of 9? (I see two diagonals. The sum of the digits of each number shaded is 9. On the diagonal starting with nine, the tens digit increases by one and the ones digit decreases by one.)

Look at all the charts. Do you see any common patterns in them? (Only the multiples of 2 and 5 have entire rows shaded. The multiples of 2, 4, 6, and 8 have only even number shaded. The multiples of 3 and 6 have two numbers not shaded between shaded numbers in each column. The diagonals on the 9's chart are found in the 3's chart. There are many other patterns. I discover new ones every time I do this activity.)

 Have one student summarize today's lesson. Number patterns are found in many places on a hundreds chart.

Student Sheet 119 (Patterns: Lesson 6)

Multiples of 2

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

Multiples of 3

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

Multiples of 8

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

Student Sheet 119 (Patterns: Lesson 6) (continued)

Multiples of 7

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

Multiples of 4

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

Multiples of 5

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

Student Sheet 119 (Patterns: Lesson 6) (continued)

Multiples of 6

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

Multiples of 9

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