Lesson 7: Two-digit number patterns

AND

Lesson 8: Patterns in hundreds charts

Lesson type: Pattern-Building

Time Allocated: 40-60 minutes

Overview:

Aim: To help students understand what adding ten does to a number, examining the patterns of which digit changes and which digit stays the same, and linking these with visual patterns in the hundreds chart. To build links between written format for numbers and physical objects such as bundling sticks and MAB blocks.

Note: The important questioning from this Lesson is demonstrated in the grade two lesson from the DVD series, Teaching Back to Front with Tierney (http://goo.gl/os3tfe). *Consider watching it first to see what happens and where students get stuck.*

Concepts targeted in both Lessons:

- Our number system is "base ten", meaning that we work in multiples of ten. Ten *tens* make one *hundred*. Ten *hundreds* make one *thousand*.
- The position of the digits in a written numeral determines which number is written. 324 is different from 432.

Main tasks:

- Identify how the numbers in a particular column of a hundreds chart are related to each other.
- Determine which digit changes and which digit stays the same when 10 is added to a two-digit number.
- Use blocks and bundling sticks to represent numbers.

Resources:
For Lesson 7, you will need bundling sticks, rubber bands and copies of the work sheet.
For Lesson 8, you will repeat a very similar process, but use MAB blocks instead.

Format:

Lesson 7:
Hand out the work sheet. Work through each question together, allowing the children to try the question and then discuss it in pairs. Focus on the pattern of tens.

Lesson 8:
This is a repeat of Lesson 7, but without the teacher choosing the starting number and using MAB instead of bundling sticks. It enables the students to check and see if the pattern that they found in Lesson 7 is the same for other numbers as well. MAB blocks are an important visual cue for students when learning numbers larger than 1000, so please try to make the links between MAB and bundling sticks clear.

Differentiation:

Extension students:

- Consider moving straight on to Lesson 9, Extending patterns in hundreds charts.
- Also have them make each of the numbers with MAB as well as bundling sticks and look for patterns between these. Use a metre ruler for the students to line the MAB up against, as 16 will come to 16cm. That way when they are adding 10 it becomes easier to see the jumps. Focus on adding multiples of ten as well (e.g. 20, 30, 50) and going past 100.

Support students:

- The important questioning from this Lesson is built into this lesson. To watch rather than read about this watch the grade two Lesson from the DVD series, *Teaching Back to Front with Tierney* (http://goo.gl/os3tfe).

Two-digit number patterns:

In our number system, the pattern of tens is really important. In this activity you will try to figure out how bundles of ten are related to the way in which numbers are written.

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

Find the number 16 on the chart. Colour it in yellow.
Get 16 bundling sticks or pencils. Draw them here:

Bundle your sticks or pencils into groups of ten.

- How many groups did you make?
- How many sticks are left over?

The number 16 is written below here. Circle the part of the number that shows the groups of ten. Put a square around the number that shows how many sticks are left over.

16

Now find the number 26 on the chart above. Colour it in green. How is it kind of the same as 16?

Make 26 from bundling sticks. Draw the bundles and left overs here. Circle the part of the number that shows the groups of ten. Put a square around the number that shows how many sticks are left over.

26

What do you notice about the way the number is written and the number of bundles and left-overs that you have? Look for a pattern.

Make 36 from bundling sticks. Draw the bundles and left overs here. Circle the part of the number that shows the groups of ten. Put a square around the number that shows how many sticks are left over.

3 6

What do you notice about the way the number is written and the number of bundles and left-overs that you have? Look for a pattern.

Make 46 from bundling sticks. Draw the bundles and left overs here. Circle the part of the number that shows the groups of ten. Put a square around the number that shows how many sticks are left over.

4 6

What do you notice about the way the number is written and the number of bundles and left-overs that you have? Look for a pattern.

Make 56 from bundling sticks. Draw the bundles and left overs here. Circle the part of the number that shows the groups of ten. Put a square around the number that shows how many sticks are left over.

5 6

What do you notice about the way the number is written and the number of bundles and left-overs that you have? Look for a pattern.

What is the same about each of the numbers above? What is changing? How does that relate to the digits? Describe the pattern that explains all of the numbers above:

Patterns in hundreds charts

This chart shows all the numbers between one and one hundred in a very specific layout. In this activity you will try to find patterns in how the numbers in columns and in rows are related to each other.

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

Choose a number in the second row of the chart. Colour it in yellow.

Make it from MAB blocks. Draw it here:

Add ten to your number. What do you get?

Colour that number in yellow too. Draw it here with MAB blocks:

What is the same about your drawings? What is different?

Add ten to your new number. What do you get?

Colour that number in yellow too. Draw it here with MAB blocks:

What is the same about your drawings? What is different?

Add ten to your new number. What do you get?

Colour that number in yellow too. Draw it here with MAB blocks:

What is the same about your drawings? What is different?

Add ten to your new number. What do you get?

Colour that number in yellow too. Draw it here with MAB blocks:

What is the same about your drawings? What is different?

Add ten to your new number. What do you get?

Colour that number in yellow too. Draw it here with MAB blocks:

Look at all of your drawings. How do the patterns in your numbers, drawings and blocks relate to their position in the hundreds chart?