re(Solve) MATHS BY INQUIRY Place Value Cards

Y2

Summary of learning goals

- These tasks explore the multiplicative place-value properties of numbers. Students learn to represent numbers up to 1000 as multiples of 100s, 10s and 1s. For example, $664 = (6 \times 100) + (6 \times 10) + (4 \times 1)$.

Australian Curriculum: Mathematics (Year 2)

ACMNA026: Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and tens from any starting point, then moving to other sequences.

ACMNA027: Recognise, model, represent and order numbers to at least 1000.

ACMNA028: Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting.

Summary of lessons

Who is this sequence for?

- The sequence introduces the multiplicative place-value properties of numbers. Students should have a sound understanding of the additive place value of numbers; that is, 64 is made up of 60 and 4.
- Students also need experience skip counting off the decade by 10s and 100s.

Lesson 1: Counting Cards

The teacher uses a set of cards with 1, 10 and 100 printed on them and asks students to skip count according to the number printed on the card. The cards are shuffled and again skip counted according to the number on the card. Students are asked to consider why they reach the same total when the cards are presented in a different order. They then explore the relationship between the cards and the place-value property of the final number in the count.

Lesson 2: Counting with Plato

Students look at the fact that counting ten 1s is equal to 10, ten 10s is 100 and ten 100s is 1000. Plato the counting robot is introduced to the students. The students count with Plato and then, using the total of the count, reflect on how many 1s, 10s or 100s may have been shown in the counting sequence.

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Australian Academy of Science

Reflection on this sequence

Rationale

The place-value properties of a number can be represented additively; for example, 136 = 100 + 30 + 6. They can also be represented as a multiplicative; for example, 136 = one 100 + three 10s + six 1s, which can also be represented as 136 = (1 × 100) + (3 × 10) + (6 × 1). The latter representation is more typically used in classrooms but, considering students do not learn to multiply until the middle primary years, stating 'one 100' or 'three 10s' can hold little or no meaning to students. This sequence is focused on building students' understanding of multiplicative place-value representation while still allowing them to draw on additive representation.

The sequence also builds the idea of regrouping. In the first lesson, students count no more than eight cards each of 100s, 10s and 1s, meaning that the cards neatly represent the place value parts of the number. In the second lesson, the students count more than ten cards each of 100s, 10s and 1s. When exploring the place value of the number, the cards no longer neatly represent the place value parts. Students are asked to regroup; that is, group ten 10s together to form one 100 or ten 1s together to form one 10.

reSolve mathematics is purposeful

- Students build fluency with counting and place value. The sequence also explores substantial mathematical idea regrouping.
- Although the focus of the sequence is on place value, the first lesson also touches on the important mathematical understanding of commutativity. Students see that the order in which the cards are counted does not matter, as they will always reach the same total.

reSolve tasks are inclusive and challenging

- This sequence provides prompts to enable access and challenge for all students. Limiting the size of the numbers to just 1s and 10s still allows students to explore the same important mathematical ideas as those explored when counting with 100s, 10s and 1s.

reSolve classrooms have a knowledge-building culture

- This sequence requires students to work collaboratively with fellow classmates. Their collaboration is more than just completing the task together. They are encouraged to listen carefully to each other, question, critique, discuss and correct as needed.