re(Solve) MATHS BY INQUIRY Cartoon Counting

Y 4

Summary of learning goals

- Students will participate in an exploration of a different number base to build a deeper understanding of and appreciation for our base-10 number system.
- Students will explore grouping by 8s to create a place-value system based on 8 and investigate the ways in which base 8 can be represented on a number chart, highlighting patterns.
- They will explore the similarities and differences between the two number systems.

Australian Curriculum: Mathematics (Year 4)

ACMNA073: Apply place value to partition, and rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems.

Summary of lessons

Who is this sequence for?

- It is anticipated that students will have a developing understanding of the ways in which our number system is built around the number 10.
- Students should be able to unitise groups to make tens, hundreds, thousands and beyond. They should also be able to partition numbers into their place-value parts and recognise that the value of a digit is determined by its place in a number.

Lesson 1: Cartoon Counting

Students consider what counting would be like for cartoon characters, who generally have only eight fingers. Our number system uses 10 as its base, as we have 10 fingers. Students are asked to think about the ways in which numbers might be grouped using a base of 8 and so reinvent base-8 numbers.

Australian Academy of Science

Reflection on this sequence

Rationale

The purpose of this task is not primarily to learn a new base number system but, rather, to build a better understanding of our own base-10 number system. Working with a different base is an effective way to draw attention to the structure of our own number system. Students can become very familiar with the mechanics of working with numbers and place value without having a deep understanding of numbers. Working with a different base moves students out of their comfort zone as they need to restructure numbers, and helps them to see the power of 10 in our system.

reSolve mathematics is purposeful

- This task employs students' creativity and imagination to restructure our number system.
- Students use a different base to better understand the power of 10 in our number system.

reSolve tasks are inclusive and challenging

- Working with an unfamiliar base moves students from what is familiar to something very unfamiliar, creating a high level of challenge.
- Access is provided through enabling prompts that explicitly link the task back to base 10. This prompt still requires students to work on the same mathematical purpose as those working with base 8.

reSolve classrooms have a knowledge-building culture

- This task supports students to apply their existing knowledge, challenge their thinking and explore misconceptions in a collaborative environment.
- A 'gallery walk' invites groups to share their counting methods and answer questions from other class members.
- Students are invited to re-count their collection, adopting new learning received from others in the class.