re(Solve) MATHS BY INQUIRY **Odds and Evens**

Y 4

Summary of learning goals

- This sequence focuses on developing students' understanding of the properties of odd and even numbers. Students explore the results of adding and subtracting odd and even numbers, and use these results to make generalisations.

- The primary generalisation that forms through the sequence is that adding an odd number of odds will always produce an odd total. Students apply this generalisation to solve problems and to explore patterns.

Australian Curriculum: Mathematics (Year 4)

ACMNA071: Investigate and use the properties of odd and even numbers.

ACMNA083: Find unknown quantities in number sentences involving addition and subtraction, and identify equivalent number sentences involving addition and subtraction.

Summary of lessons

Who is this sequence for?

- Students should have prior understanding of what makes a number even or odd. They need to view even numbers as numbers that are divisible by 2 with no remainder, and view odd numbers as those with a remainder of 1 when divided by 2.

- Students employ their mental computation skills.

Lesson 1: Number Maze

Students are presented with a number maze. As they move through the maze, students need to total the numbers on the path they follow. The challenge is to complete the maze with an odd total. By exploring possible solutions to the maze, students form generalisations about the results of adding odd and even numbers. They see that an odd number of odds in the sum is required to get an odd total.

Lesson 2: 10 to 1

This task challenges students to use addition, subtraction and the numbers 10 down to 1 to make a total of 27 and a total of 12. They will see that it is possible to create only an odd total with these numbers. Students look at the largest and smallest positive totals for the problem. They also look at the ways in which they can modify the task to create even totals.

Australian Academy of Science

Reflection on this sequence

Rationale

An important aspect of algebra is that of generalising number and arithmetic structures. This sequence focuses on forming generalisations when performing additive calculations with odd and even numbers. Students explore addition and subtraction with differing amounts of odd and even numbers to determine if their sum will be odd or even. Students' understanding and the ability to form a generalisation is reliant on understanding odd numbers as those numbers that when divided by 2 have a remainder of 1; and even numbers as those that can be evenly divided by 2.

reSolve mathematics is purposeful

- Students are encouraged to experiment, form hypotheses, and then test and prove their theories.
- This sequence draws on prior knowledge but introduces new contexts for study. It is a rigorous examination of a simple set of concepts with practical applications to number sense.

reSolve tasks are inclusive and challenging

- Both tasks in this sequence begin with students being given an unstructured problem and then allowed time to interact with the problem on their own terms and to experiment with its possibilities.
- As the sequence focuses on finding and testing hypotheses, a range of approaches to suit students' skill levels are provided.
- The lessons focus on students sharing and working together to recognise patterns in their collective data, and are structured so that all students can make a valuable contribution.

reSolve classrooms have a knowledge-building culture

- This sequence relies on the class to collect and analyse data as a group. Independently, students will struggle to collect enough data to draw generalisable conclusions.
- The focus here is independent exploration and then collective discussion and analysis during which each student provides their own examples.