reSolve MATHS BY INQUIRY Addition Chain

Y8

Summary of learning goals

- This resource focuses on mathematical reasoning using algebra. Students use spreadsheets to investigate potential arithmetic relationships and then use algebra to identify and justify which relationships are generally true. The task can be used as a springboard for an in-depth exploration of the Fibonacci sequence, and develops skills in using spreadsheets.

Australian Curriculum: Mathematics (Year 8)

ACMNA191: Factorise algebraic expressions by identifying numerical factors.

ACMNA192: Simplify algebraic expressions involving the four operations.

Summary of lessons

Who is this sequence for?

- This lesson is designed to consolidate skills in algebra, including collecting like terms, and expanding and factorising using the distributive law. The resource emphasises the importance of algebra in generalising and justifying arithmetic results. It is assumed that students have some familiarity with algebraic notation.

Lesson 1: Addition Chain

This resource starts with a teacher-led calculation short cut and asks students to think about how it is done and why it works. Students use spreadsheets to search for similar relationships and use algebra to explain which of these are always true. The task can be used as a springboard for an exploration of the Fibonacci sequence.

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Australian Academy of Science

Reflection on this sequence

Rationale

Approaching algebra as generalised arithmetic shows students the power of algebra when abstracting number. This focus on algebra as generalised arithmetic is typically under-represented in secondary mathematics in favour of more time spent on functions and equations.

reSolve mathematics is purposeful

- This sequence supports a rich interpretation and enactment of the Australian Curriculum: Mathematics, providing fun and engaging ways to understand the algebraic content of the Curriculum. The lesson draws on well-established mathematical concepts to identify the algebra within the context of numerical sequences; it also explores well-known sequences such as the Fibonacci sequence.

reSolve tasks are inclusive and challenging

- The task activates existing knowledge, develops new knowledge and explores relationships between key ideas in the Australian Curriculum. Students are required to navigate a variety of different statistical and mathematical software in ways they are unlikely to be experienced with, and which include a wide variation of prompts and programs to suit students.

reSolve classrooms have a knowledge-building culture

- The task in this sequence begins by inspiring curiosity and intrigue through a shared classroom experience that promotes higher-order thinking through the role of both teacher and student. Students build understanding through collaborative inquiry, action and reflection. It encourages students to challenge their existing concepts and to use their mistakes as a vehicle for further learning.