

LUNCH LAP: Sequence Overview

Summary of learning goals

Students apply Pythagoras' Theorem to explore a practical real-world problem. They use spreadsheets and dynamic modelling techniques to model and solve the problem, then use geometric reasoning to justify their findings.

Australian Curriculum: Mathematics (Year 9)

ACMMG222: Investigate Pythagoras' Theorem and its application to solving simple problems involving right angled triangles.

Summary of lessons

Who is this Sequence for?

This sequence is designed to develop and consolidate skills and conceptual understanding of Pythagoras' Theorem. The lessons assume that students have been introduced to Pythagoras' Theorem and are able to complete routine calculations to find the length of the hypotenuse or of one of the short sides.

Lesson 1: Modelling a Lunch Lap

Students participate in an investigation to find the length of a path that touches three sides of a rectangle, starting and finishing at the same point on the fourth side. They model the problem, use Pythagoras' Theorem to calculate the length of the path, then work with spreadsheets and GeoGebra models to find the shortest possible path.

Lesson 2: Understanding a Lunch Lap

This task builds on the first lesson in the sequence. Having established that the length of the shortest path remains unchanged regardless of the position of the gate, and that it forms a parallelogram, students use geometric reasoning to find the positions of the carts and justify that the parallelogram is the shortest path.

We value your feedback after these lessons via our website.

Reflection on this sequence

Rationale

The concepts behind Pythagoras' Theorem and its proofs are taught well in classrooms, and there are ample high quality resources to assist teachers. This sequence is not intended to prove or teach the theorem for this reason. However traditional applications are often shallow and uninteresting and so the focus here is on providing an explorative and atypical application.

The tasks in this sequence provide an imagined application of interest that produces a surprising result. The lessons also provide useful opportunities for fluency with Pythagoras' Theorem.

reSolve Mathematics is Purposeful

- This sequence provides interesting applications of Pythagoras' Theorem aimed at building students' fluency with calculations in unorthodox contexts.

reSolve Tasks are Challenging Yet Accessible

- Lunch Lap can be modelled in different ways to best suit the classroom's preferred style of learning.
- Tasks build on foundational understanding of Pythagoras' Theorem but push knowledge in new directions and relate to other mathematical principles.

reSolve Classrooms Have a Knowledge Building Culture

- Lunch Lap relies on collaborative inquiry, action and reflection to reach a solution.