INTERACTIVE WORKSHOP

Tick Tock!

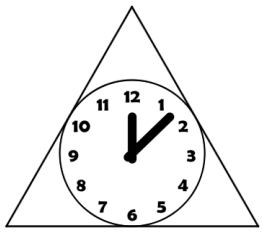
Topics: Geometry, Area and Trigonometry

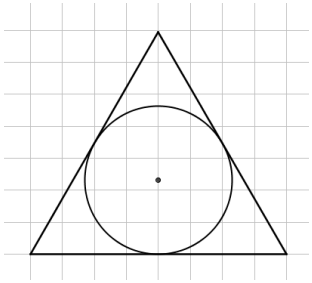
Given an equilateral triangle students are asked to find the area of its in-circle in as many ways as possible.

Year Group: 5th Year
Level: Leaving Certificate Higher

Posing the Task

A manufacturer wishes to make a clock using a triangular sheet of metal. What is the area of the largest circular clock face that she can make using the measurements in the diagram below?





Planning the Boardwork

Response 1- Use grid paper to find an approximation of circle area

- Approximating form the area of the equilateral triangle using grid paper

Response 2- Measuring Radius with Ruler and use πr^2

- Use a ruler to measure radius (diameter) and use area of circle (πr^2)- approx. length of radius 2.3cm answer = 16.62cm² /radius of 2 cm gives 12.57cm²

Response 3- Area of Triangle minus area of circle non area of circle

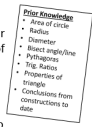
- Approximating form the area of equilateral triangle and subtract three 'triangles'

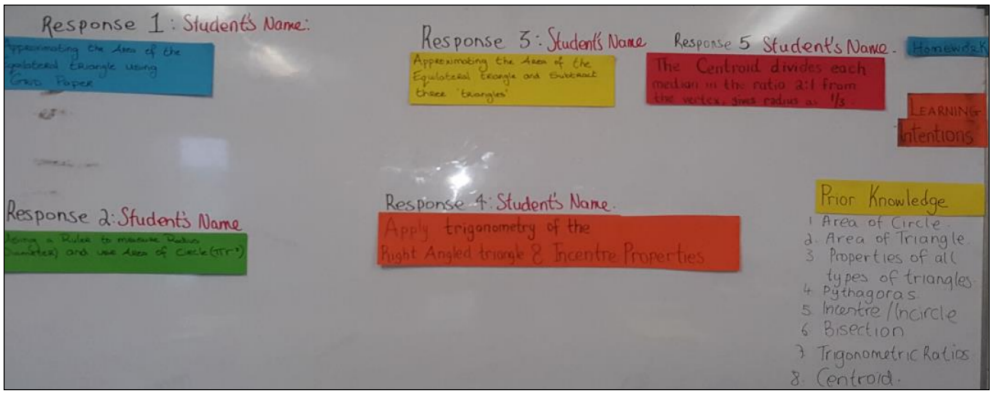
Response 4- Using trigonometry and constructions to find radius and use πr^2

Use Pythagoras, trigonometric ratios and knowledge of incentre being on the bisector of the angle to find radius and utilize area of circle formula

Response 5- Use properties of centroid to find radius and use πr^2

- The centroid divides each median in ratio 2:1 from the vertex, gives radius as $^1/_3$





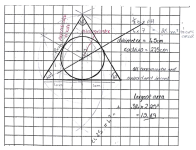
Prior Knowledge & Posing the Task
10 minutes

Students working on the problem
15 minutes

Presentation of Solutions & Ceardaíocht
15 minutes

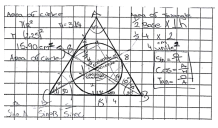
Summing up & Reflection
5 minutes

Reflecting on the Lesson



Students' knowledge of geometry and trigonometry was high but they struggled to apply it to solve the problem. Students seem to prefer to acquire knowledge from a teacher instead of investigating their own methods of finding a solution.

Once they had found one way to solve the problem some students didn't investigate other ways. Students need to experience more thinking for themselves if they are to become proficient problem solvers.



Developed by Bernice O'Leary, Declan Cronin, Eimear White, Margaret Barrett from Coláiste na Toirbhirte. With thanks to Iris Graham and the students of Coláiste na Toirbhirte, Co. Cork.

To download this lesson plan visit www.projectmaths.ie/mc2017

Maths Counts 2017
Engaging teachers in Lesson Study
Maynooth University, 3rd-4th March 2017

Foireann Forbartha Mata
Maths Development Team