MATHS

SSEP EXAMPLE // ENGINEERING
DEVELOPED BY // HAMILTON GIRLS HIGH SCHOOL AND LONGVELD ENGINEERING

ACTIVITY EXAMPLE

KEY WORDS

Trigonometry | percentages | decimals | ratios | numbers | height | weight | length | calculations | measurement | range | cost | engineering | design

ALSO USEFUL FOR

Science | Physics | Business | Engineering | Metal Technology | Design and Visual Communications

PROGRAMME OUTLINE

3 POINTS OF CONTACT

- Longveld staff come into classroom (x2)
- Workplace visit (x1)

EXAMPLE

1. Longveld staff come into classroom, introduce themselves and their careers, background to engineering, and how maths is used in the industry. Student activity: Trigonometry exercise.
2. Workplace visit includes tour of engineering firm, meeting staff and hearing about different careers. Student activity: folding and stamping a personalized triangular metal name plate.
3. Longveld staff come into classroom. Student activity: Case study costing exercise.



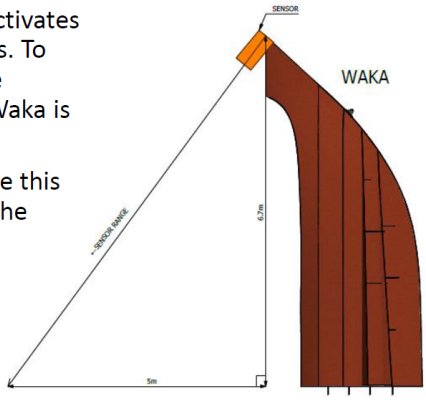
For more on SSEP see:
www.smartnz.nz

Trigonometry exercise:

Problem:

- The waka has a sensor on the top which activates when someone is standing within 5 metres. To buy this sensor we need to know what the required range will be. The height of the Waka is 6.7m. The distance from the Waka is 5m.
- Find the length of the sensor range and use this to select the type of sensor needed from the table.

Trafi-One Sensors	RANGE
TYPE A	4m-6m
TYPE B	6m-8m
TYPE C	8m-10m



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CASE STUDY: TIMUTIMU SCULPTURE costing exercise

Figure 1 - TIMUTIMU SCULPTURE IN PLACE ON THE WAIKATO EXPRESSWAY

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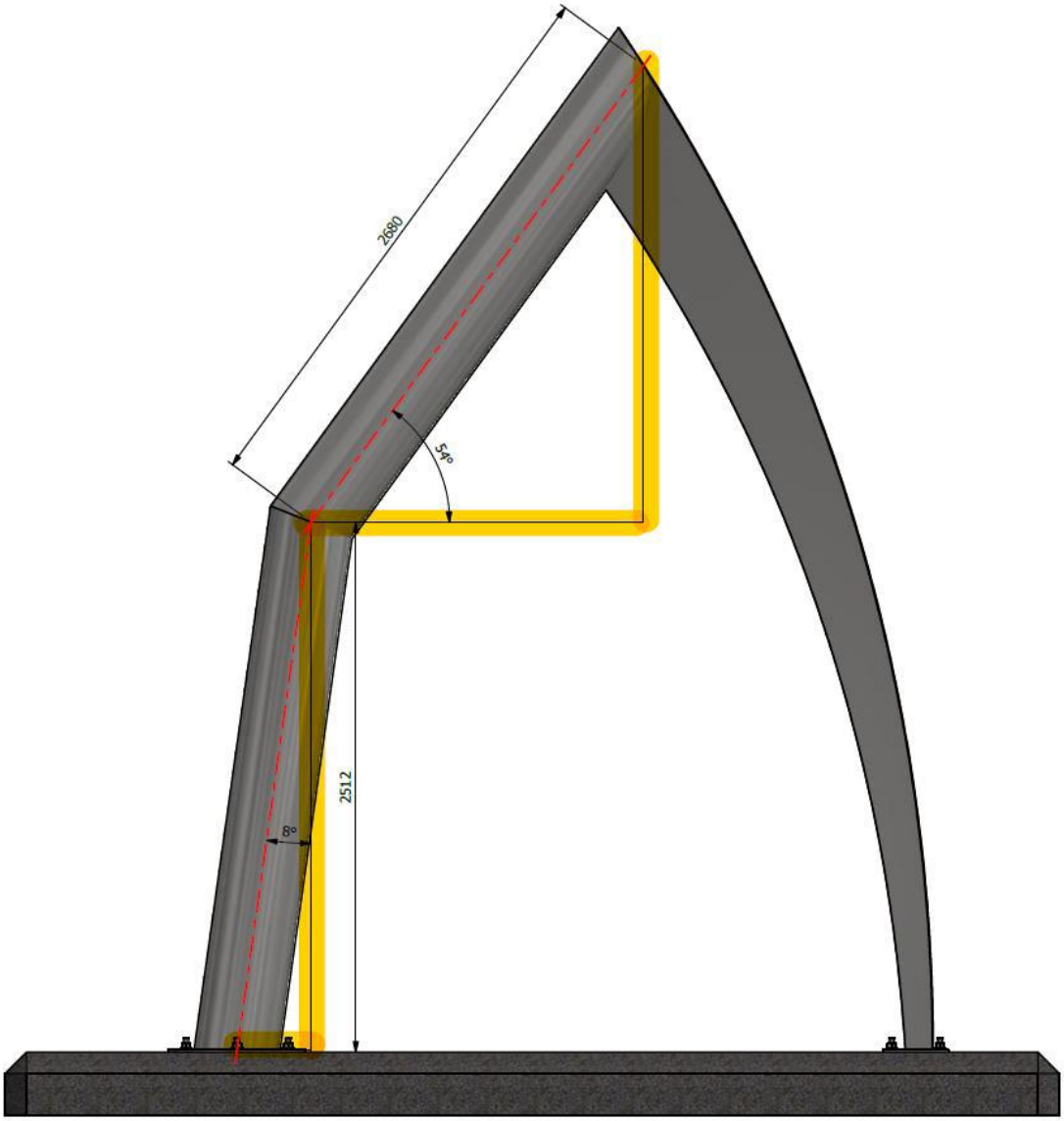

Figure 2 - TIMUTIMU SCULPTURE SCHEMATIC

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COSTING EXERCISE

WORKSHEET: USE 1 DECIMAL POINT FOR ALL WORKING

1. Using your knowledge of trigonometry and right-angles triangles, calculate the overall height of the sculpture:

2. Calculate the length of pipe needed to make the left-hand side of the sculpture:

3. If the amount of sheet metal needed to make the right-hand side of the sculpture is 4.5m², and the sheet metal weighs 24kg per m², how much sheet metal is required in kilograms?

4. 3mm sheet metal is $6.00 per kg and the tube for the left-hand side is $235.00 per metre, how much did the material cost for this sculpture?

5. This sculpture took 600 hours to make. If labour costs $45.00 per hour, figure out the labour cost for this job.

6. Now you should have the total cost of this sculpture. However, to make money as a business, you need to sell products at more than what it cost to make it. If we apply a 25% mark-up to the sculpture, what is our sell price going to be?

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