Firstly, the engagement activities will be directed to teach Year 9 onwards. Allowing the ability to see what works best, it can be adapted so that Year 12s are able to learn the topic of mathematics. Year 9 ages are 13-14 in KS3, and Year 12 are 16-17 years old in KS5.

According to the Mathematics programmes of study: key stage 3, page 4, [1], the aim of my project is to use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships. In addition, it would substitute values in expressions, rearrange and simplify expressions, and solve equations and finally use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics.

Reason mathematically:

* extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically

Geometry and measures

* ♣ apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras’ Theorem, and use known results to obtain simple proofs ♣ use Pythagoras’ Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles

KS4 [2]

Geometry and measures

Text, letter

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[1] <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/239058/SECONDARY_national_curriculum_-_Mathematics.pdf>

[2]

<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/331882/KS4_maths_PoS_FINAL_170714.pdf>

A article was published for the research of Euclidean Constructions and the Geometry of Origami, as shown in [3].

[3] <https://www.jstor.org/stable/2690924?seq=1#metadata_info_tab_contents>

As mentioned in [4], there are many resources in teaching students mathematics using origami. [4] has mentioned a variety of topics that can be covered and provides links for inspiration when creating their own material.

[4] <http://www.paperfolding.com/math/>

Trisecting an angle was one thing that could have been shown [5], but as I was looking to understand and present the topic of trigonometry, this has been forgone.

[5] <https://plus.maths.org/content/trisecting-angle-origami>

This [6] was one of the initial pages which had provided me the links to [4].

[6] <https://riverbendmath.org/modules/Origami/Sonobe_Polyhedra/Links/teaching>

This was [7] providing a collection of almost 200 single concept lessons. It was interesting to research and review them as it gave an insight to how to teach students.

[7] <https://mypages.iit.edu/~smile/mathinde.html>

I found a resource [8] asking about the “Math in Origami”, detailing a few different things that we could teach.

[8] <http://sigmaa.maa.org/mcst/documents/ORIGAMI.pdf>

[9] was a brilliant resource as it detailed many links as well. This helped to ensure that I could figure out what I would like to include.

[9] <https://www.artfulmaths.com/origami-in-lessons.html>

This was also similar to [5], as from the same website, it showed the trisect of an angle.

[10] <https://plus.maths.org/content/power-origami>