

Possible Project Ideas

If you are stuck when trying to pick a topic for the project, here are some possible topics. This list is not all encompassing, and you can certainly pick another topic not on this list. Many of these topics are very open ended, and it is completely reasonable to focus on just one aspect of one of these topics.

Option 1

1. Symmetries of the Conic Sections
2. Plane Isometries
3. Polytopes
4. Polyhedra
5. Repeating Decimals
6. Pythagorean Triples
7. Cartesian Coordinates and Plotting

Option 2

1. Frieze Groups
2. Crystallography Groups
3. Siteswap Juggling Notation
4. Rubik's Cube
5. Card Tricks
6. Abstract Algebra in Music (intervals, polyrhythms, 12-tone rows)
7. RSA
8. Error Correcting Codes

9. Noether's Theorem
10. Chemical Compound Structures
11. Knitting Patterns
12. Group Theory and Games

Option 3

1. Insolvability of the Quintic
2. Straight Edge and Compass Constructability
3. Graph Theory
4. Burnside's Lemma
5. Algebra in Combinatorics
6. Classification of Finite Simple Groups
7. Monster Group
8. Fermat's Last Theorem
9. Homotopy Groups
10. Homology Groups
11. Fundamental Groups of Surfaces
12. Isomorphism Theorems
13. Sylow Theorems
14. Higher Dimensional geometry
15. Free Group
16. Galois Theory
17. Cubic Curves
18. Quaternions/Octonions/Sedenions

19. Split Numbers, Dual Numbers

20. Surreal Numbers