

Engineering project leaving cert

[Engineering](#)



**ASSIGN
BUSTER**

Central to the production of the recent films of the Batman Trilogy was the creation of a new concept of vehicle using evolving car technologies and many creative design features derived from the former Fathomable vehicles. The unprecedented design challenges resulted in what is now an iconic creation, of ground breaking mechanistic engineering, called the Tumbler. Design a model Tumbler to the general specifications outlined below. The Tumbler should be your own unique design and should: (a) Have a rear wheel propulsion unit; (b) Incorporate an automated door for easy access; (c) Include a steering mechanism Tumbler:

Propulsion unit: method of movement Automated door: a self-opening door

Easy Access: easy way of approaching, entering, exiting, communicating with, or making use of Presentation of the completed model should ensure that: (a) All main operating features are clearly visible without dismantling. (b) The longest dimension of the model does not exceed 100mm. (c) Electric power does not exceed 9 volts. Special note: The use of modified toys or model kits is not acceptable. Dismantling: the act of taking something apart

2.

Design Process(40 marks) A design folio must be completed which will detail your: a) Analysis of the given brief and investigation of possible solutions; (b) Criteria for selection four own individual solution and production drawings/plans; (c) Testing and Evaluation Of your design solution; (d) Special instructions, if required, regarding the testing of the solution by the examiner. Note: marks are awarded as shown in marking scheme. Computer-aided design(CAD) should be used where possible.

Criteria: A standard, rule, or test on which a judgment or decision can be based. 3. Design Realization (110 marks) Using appropriate materials, make the model according to your own individual design plans. Computer numerical control (CNN) technology should be used, where possible, to support manufacture. You are required to manufacture and assemble all the parts, subject to the following guidelines: (a) Standard components may be used to support the assembly and interconnection of various parts; (b) Unnecessary recycling will result in lost marks.

Recycling will be acceptable only in cases where a complex part cannot readily be made in the school; (c) Bought-in electronic solutions will result in lost marks; (d) Adhesives, if used, should be applied sparingly. Note: Marks are awarded as shown in the marking scheme Computer numerical control(CNN): the automation of machine tools that are operated by abstractly programmed commands encoded on a storage medium.

Interconnection: To be connected with each other Complex: a whole that comprehends a number of intricate parts Sparingly.

Deficient or limited in quantity, fullness, or extent. 4. Introduction (B) The famous 'Tumbler' automobile that is featured in the Batman Movies has changed dramatically since its first appearance in May 1939. The car has evolved from comic books to television and films reflecting evolving car cosmologies. It is now a modern land vehicle that first featured in Batman Begins (2005), and also featured in The Dark Knight (2008) and The Dark Knight Rises (2012). Design a model Tumbler to the general specifications outlined below.

The Tumble should be your own unique design and should: (a) Have a rear wheel propulsion unit (b) Incorporate an automated door for easy access (c) Include a steering mechanism. Presentation Of the completed model should ensure that: Analysis of Thematic brief My understanding Of the thematic brief is as follows: must design and make a Tumbler that has a Functional rear wheel repulsion unit. This doesn't necessarily have to me a motor driven unit. I must 'incorporate an automated door for easy access. This means that I must make a door that is capable of opening and closing by itself by either the use of sensors, magnets, motors or other mechanisms to make to door automated. Must 'include a steering mechanism. This could be an automatic steering mechanism or else a manual steering mechanism. Must make 'all operating features clearly visible without dismantling. ' This could mean making them outside the Tumbler on the exterior, or else making them in a Lear Perspex box. The longest dimension of the model 'must not exceed mum. This can be achieved by proper planning of the model so that it does not exceed mum. All electric power 'must not exceed 9 volts. ' This means that can use multiple batteries or motors but it can't exceed 9 volts individually. Research & Investigation History of the Tumbler: The concept of the Tumbler was first witnessed in the movie Batman Begins in 2005. It was developed for the Batman Trilogy which included Batman Begins (2005), the Dark Knight (2008) and The Dark Knight Rises (2012).

It is a odder development of the famous Fathomable which made its first appearance in Detective Comics #48 (May, 1941 The car has evolved along with the character from comic books to television and films reflecting evolving car technologies. It now looks like this: Investigation of existing

<https://assignbuster.com/engineering-project-leaving-cert/>

solutions: The Tumbler was originally sporting a military desert camouflage paint. Bruce Wayne(Christian Bale) then requested to Luscious Fox(Morgan Freeman) to have it painted black, hence the current look and color of the Tumbler. Mechanisms and Materials Before started to design my Tumbler I looked at all the mechanisms and trials available to me.

I highlighted their advantages and disadvantages and selected the ones that best suited me. I needed some form of mechanism to transmit drive from my motor to my Tumbler. I needed to select materials that would be strong enough to support, light enough for the motor to rotate and in some cases transparent so that the operation of the Tumbler could be clearly seen.

Mechanisms for steering: Rack & Pinion: Easy to control Lighter than other mechanisms Will not slip Mechanisms for the door Cam & Follower Any shape to easily fit my design open/close motion.