

Mousetrap Racers

The 5-Step Design Process

One may start off by asking what is the “right way” to build a mousetrap racer. Although there are some basic tips the best approach is to apply basic ideas from physics, plan out the steps taken, perform some tests, and apply what is learned as the process progresses. A good performance of a mousetrap racer is a combination of finding balance between all of the elements used in building the racer. There is not one correct and perfect way of building a racer. One detail may work for one person but not for another depending on variations of design. Experimentation of new ideas are encouraged. Even if the idea may not work it may lead to another important discovery or conclusion.

Overall, many designers will find out that simple physic and design concepts produce the best results. As the parts go together one can begin isolating variables that influence their mousetrap racing car. For example, if a wheel axial is not straight the racer had a tendency to turn and run in a circle. This is why testing is extremely important because problems can become apparent before race day that can be fixed, changed or adjusted components of the car. This is applying the idea of the 5-step design process as follows:

Stage 1- Identifying the Problem: To build a mousetrap racing car that functions and looks aesthetically pleasing.

Stage 2- Concepts and Ideas: Basic materials were given to build a mousetrap racer but not directions on how to build it. Students were given some tips, allowed to ask question and for help and studied past built mousetrap cars but had to come up with their own solution to the problem.

Stage3- Compromise Solutions: After considering all their ideas students had to select the ones they would apply to building the racer.

Stage 4- Models and Prototypes: Students applying what they had gained through steps 1-3 to build a mousetrap racing car. During this period testing was done on the prototypes to ensure they were operational.

Stage 5- Production of Working Drawings: Working Drawings were produced by reverse engineering the racers. A CAD drawing of the Front, Top and Right Side view with notes and dimensions were produced.

The final race was a race to see whose mousetrap car could travel the greatest distance and the fastest.

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Step 1: Identification of problem, need or “customer”.

In this step you will need to ask and answer a number of questions. For example you may ask; How does the mousetrap racer work? Where will the mousetraps be raced? What is the goal of your mousetrap racer? What kind of materials will you need? How can you build it? Etc. List a number of questions, issues or “problems” you have at this point. However remember right now there is no solution.

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Step 2: Concepts and Ideas:

*In this step you will do things such research ideas, look at what others have done in the past, look at similarities between what you want to do and another object/ design. Many, many, many ideas are collected, **reasonable and otherwise**, for possible solutions to the problem and many,many,many sketches are produced. No attempt to evaluate the ideas at this stage, and all notes, research and sketches are dated and signed and saved for later use and record and proof.*