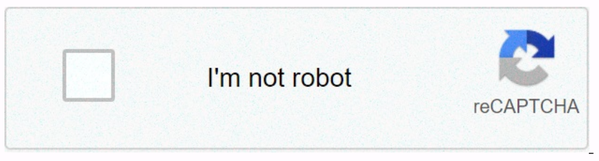

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Best mousetrap car designs for distance and speed

Mousetrap cars may differ in their designs. Although each design has its similarities, the two main designs for mice are for a long distance or speed. Mousetrap cars is powered by the spring mouse trap. When the mouse is pinned back, the lever causes energy to release. The lever is attached to a string that is winded around the rear axle of the car. Therefore, when the lever breaks with the mouse, the string develops, which rotates the axis and causes the car to move. One of the main deciding factors between distance cars and speed cars is the lever. The lever controls the acceleration and distance of movement of the vehicle. Different lever lengths affect the towing force that is applied to the drive axle and change how much string can be pulled from the axle to make the car go far. For cars from a distance, long levers are best because more strings can be pulled from the bridge to make the wheels wind more and move further. On the other hand, a shorter lever is better for speed cars because it will provide more power and power. The size of the wheels is an important part of mice. The big wheels move further with each spin than the smaller wheel. However, large wheels also require more force to start movement. Therefore, really large wheels will be ineffective, because the strength from the mousetrap will not be enough to keep the wheels in motion. On the other hand, smaller wheels will cover a shorter rotational distance, but will be significantly easier to accelerate than larger wheels. This will require less force to achieve the same acceleration on a large wheel. Long-distance speed The mouse traps of the car affect a number of factors and are very important. They can cause the car to accelerate or slow down, a short distance or over long distances, and can reduce or increase friction in the mouse car. Another significant factor of mice is the diameter of the axis compared to the diameter of the wheel. A small diameter of the axis compared to the wheel will require more strength to get started, but will cover more ground for rotation. For long-distance cars, a large diameter wheel of small diameter is best. A small diameter wheel with a large diameter axel is best for speed cars. Long-distance friction is the force that is opposite to the relative movement of two surfaces that are in contact with each other. Friction will slow the carta of mice, so it is best to reduce friction as much as possible. Moving parts will cause friction. Since friction will increase with the amount of moving components, the goal is to make the design of the mice car as simple as possible (but still make it functional). Gear Gear mouse car can its distance and acceleration. It is controlled by the length of the lever and the ratio between the and diameter of the axel. Extremely long mice are aimed at using the smallest amount of energy to go very far with a lot of efficiency. The adhesion or adhesion of the wheels of the car on the floor will determine the maximum acceleration of the mouse. It is important that the wheels have friction so that they do not rotate when the mouse is triggered. If the wheels don't have enough traction, the car won't be able to accelerate as expected. Tires will naturally have traction due to their rubber edges, but discs or other options can not. To add traction to CD wheels, rubber or bubble strips can be added to the outer edge of the wheels. Inertia inertia is also important for the construction of mice. Momentum is the resistance that the object needs to change. With greater momentum, the object will require more force to change its state of movement. Heavy mice will need more strength to cause movement that light mouse trap to achieve equal acceleration. Light mice can use less energy at first and have longer levers to increase travel distance. Rotational inertia is similar to inertia and is the resistance of an object of rotation change. The greater the distance between the wheel mass and the point of rotation, the greater the rotational inertia. This means that large wheels have more rotary inertia than smaller wheels. With greater wheel inertia, more force will be required to change the state of rotation. Wheels with large amounts of rotary inertia are useful in some way, because once the wheels move they will be difficult to stop. These types of wheels are useful for long distance mice trap cars. However, wheels with large amounts of rotary inertia will be a drawback for speed mousetrap cars because they will be difficult to move on the go. Sources: Follow these design principles to create a profitable design of a power-driven car. By Jessica Miley May 30, 2018 Mark Rober Makes Really Good YouTube Videos. The former NASA engineer is funny, goofy, but above all, really smart. In one of his latest videos, he shows you how to make a super mousetrap powered car. You can remember from high school to learn the principles of basic physics and then make a car like this yourself. Robert shows you how to win the mouse challenge, as well as carefully explains the principles behind it. The basic principle of mouse trap cars is a mechanical advantage. A basic principle you see in everyday things like roll systems, ramps and car jacks. Use this principle in your car with a mousetrap, only in reverse. Robert goes and meets one of his friends and mentors, Al, who is a physics teacher in Texas. currently the longest car driven by mice. Robert quickly learns that in order to have a winning mouse, you need a design that will provide the smallest strength at the longest distance. Lesson number two is to reduce friction. In cars with a mousetrap, friction occurs when the wheels meet the ground and where the axis meets the carosser body of the car. These are the two places you need to take care of. The use of bearings on the axles really improves the performance of the car. The last principle you need to turn around is to make your car light - it's quite intuitive, just don't make your car too big. Watch the rest of the video to get down and dirty how exactly to apply these principles to get a winning mouse design car or just learn a little more about the immersive world of mechanical advantage. What makes a car go further? Making mice car go as far as possible, relies on several design guiding principles. You'll want to design your car to have a light body, have large rear wheels, and you'll want to position the mouse as close as possible to the front of the car. As a light dense mouse trap car allows less work you need to do from the mouse trap getting the car going. This makes the overall car easier to move. The use of large rear wheels allows one turn of the axis to take the car much further distance. In other words, a given length of a string of mouse moves the car at a greater distance. The last note is to place your mouse as close as possible to the front of the car. This increases the instant hand of the mousetrap. In non-technical terms, this means that the same force from the mouse trap on each of them is exerted on a longer string pulling. When you have more string, it means more rotation of the wasps and thus your car will go further. What do you need for a mice car? Usually for each project for a mousetrap, you will be provided with a list of allowed materials, or you will need to find them yourself. Here is a list of materials that are usually good to have at hand for the project if you have a choice. MousetrapReabel tape (channel/electric)Eye hooks (for string)Wooden dowel (for the hand)Heavy cardboard or Balsa Wooden cardboard Stepper ruler or straight edgeUtlier knifePliersHow can I make mice car better? Making your mouse better probably involves optimizing it for your purpose. In general, mouse trap competitions have two categories, speed and distance. If you want to optimize for speed, you'll want to design a car that exerts as much force/wheel rotation as possible as quickly as possible. This will probably mean a shorter pulling rod of the mouse and wheels that have a lot of grip, so they don't spin in place when they rotate To optimize for distance, you can follow the steps, Design of a car with large rear wheels, a mousetrap as close as possible to the front and with a light body. Scrubbing is useful for car mice? Friction is both good and bad in the design of car mice. It's bad when it causes the car's axles to stick and not spin. However, it's good when it causes rear tyres to stick to the ground, giving you more traction and helping to keep your car going. Via: Mark Robert January 24, 2012 Learn all the secrets to building your own record, setting the mouse powered dragster. You can't build a winning mouse trap racer until you know the basics. Although there is no perfect design or plan for the ultimate speed trap racer, there are some common design elements that most record speed traps will have in common. This article outlines many of these common design elements found on most recording traps for mice. Keep in mind that as you build your first mouse, you'll want to find a harmonious balance between as many of these design elements as possible without exaggerating each concept. You'll need to do a lot of testing and regulation to perfect the vehicle. Even when two people build the same mouse racer, following the same steps, there are no guarantees that the two mice racers will travel at the same speed. That's why testing is so important that you won't know what your design problems are until you experiment with the vehicle and find out how it performs. Make small changes and driver settings to see how the changes will affect your vehicle's performance. The only way to really understand how to build a profitable mice car is to ask yourself what if I change this? and then make the change to see what happens. A good engineer knows 99 ways that something will not work and one way that it will work great, find that one way! General design Elements of Speed-Trap Racer high-speed torque gear for the lever speed smaller diameter wheels of drive wheels with good traction reduced friction bearings light weight components Speed-trap Racer: Most recording mice racers will have small drive wheels compared to distance racers, larger drive axles and shorter lever arms. Speed track racers and friction with speed traps friction is not as big a problem as for long distances traveling mice; but never less, every effort must be made to reduce and eliminate as much friction as possible. Friction is the force that acts against the movement of all moving objects. We can not eliminate friction completely, but we can try to reduce it as much as possible. As a general rule of thumb, so moving parts a device has a greater friction force acting against the system. The first step in rubbing the gully happens when planning your mouse As you plan your project, think about all the friction points your design will have and then look for ways to reduce friction points. As the number of moving components increases friction point looking for ways to simplify the design as much as possible. Using a lot of gears and rollers can be a great way to change the torque pull, but it will also lead to more friction, which will need to be addressed, to look for simplicity. Cheek Points Point number one friction of each mice car is where the axle system comes into contact with the vehicle frame. In most cases, the axis will be in direct contact with the frame and there is a lot that can be done to reduce friction at this contact point. Test rotate mouse racer wheels to see how friction they spin. If the wheels stop spinning relatively quickly, then you will need to find ways to reduce the friction of the axis. The friction of the axis depends on: The diameter of the axis Pressure on the axis of the bearing The types of materials used for the axis and bearings: Point number one of friction of each mice is always on the bearings. Find ways to reduce friction in bearings. Air Resistance Resistance Imagine that you are in a pool of water, you will find it easy to walk in the water, but after trying to move quickly or even flow into the water, you immediately feel the resistance of the water squeezing your movement; It's the same mice experience that will have as it tries to push it into the air. The faster a mouse racer moves, the more air resistance will be pushed back towards the movement of the vehicle. Design your mouse racer so that it can be cut in the air with the least amount of resistance; design your vehicle as aerodynamic. Try grinding and painting wooden frames to reduce air resistance. Factors that affect air resistance: vehicle speed in the form of vehicle air resistance: design your mice to cut off air and be aerodynamic to reduce friction force. Gear The gears of a mouse car determines the acceleration and distance of the journey. The reducer can be adjusted to increase and/or decrease the towing force, torque, travel distance and acceleration of the mice-driven vehicle. In all mice, the gears are controlled by the length of the lever arm and/or the ratio of the drive axle and the wheel device. Most long-distance recorders are aimed at the smallest possible power consumption or power consumption to maximize pulling. Smaller power outputs produce less wasted energy and have a greater The amount of energy separated by a short hand on the lever or shoulder with a long lever is the same, but the length of the lever lever will determine the rate at which energy is consumed, called output power. A good speed-trap racer will have a very high energy consumption rate and will be advanced to use it's stored potential energy before crossing the finish line. The reducer is controlled by the following: the lever length of the shoulder of the drive wheel diameter and/or the additional bonus of the drive axle: the speed track racers will use short lever arms and be adapted to use all their energy before crossing the finish line. The Lever Arm Change the length of the mouse click (or lever hand) is how you control the acceleration and/or travel distance of the mouse. Different lever lengths may be used to increase and/or reduce the towing force and to change the size of the line that can be removed from the drive axle. Changing the length of the lever arm does not change the total energy and/or torque generated by the mouse trap, but changes the pull force applied to the drive axle. Longer lever arms will have less pull strength than the shorter lever arm, but the longer lever arm will pull more string than the shoulder of the shorter lever. Changing and/or attaching a lever to the mouse is the number one means of controlling the operation of the mouse. Shorter lever arms have greater pull strength and produce greater acceleration. But if the lever is to break, the towing force will be so great that the drive wheels will rotate at the beginning. The goal with each speed trap racer is to use as short a hand lever as possible or just before the point where the drive wheel rotates. Bonus Tip: The length of the lever arm determines the towing strength and the length of the cut that can be wrapped around the drive axle. Short arms use less string, but produce more strength. Wheels and bridges By changing the size of the drive wheel(s) you can accelerate or slow down your mousetrap vehicle. Larger drive wheels have a greater running distance for each turn than smaller drive wheels. As the size of the drive wheel increases to start turning the wheel, it also increases. At some point, the drive wheel can be so large that there is not enough force from the mouse trap to keep the wheel spinning. With speed-trap racers, smaller wheels will have a shorter turn distance, but will be much easier to accelerate and require less towing force to achieve the same acceleration as a larger wheel. Smaller drive wheels should be used in the race track at speed to increase acceleration and larger drive wheels should be used on the long distances to reach more linear rotation distance. The diameter of the axle compared to the diameter of the wheel is also very important, the smaller the diameter of the axle compared to the diameter of the wheel, the more force will be required to accelerate the vehicle, but the greater the distance of the on rotation. This bridge-wheel ratio is part of a mouse gear that needs to be understood to build the perfect racer for the race within the race. For long-distance racers, a large diameter wheel of small diameter is required. For speed traps, a drive wheel of smaller diameter with a larger diameter is required. It is always important to understand the relationship between variables, but never over exaggerate each concept. The ideal size for a speed track racer's drive wheel is between 2 and 3 inches, but not more than 4 inches. Bonus Tip: Riders with speed traps must have fewer drive wheels and larger drive axles. This picture is the drive axle is built with tape to increase torque. The output power of the power output is the speed at which energy is used. Heat and sound are forms of friction that will eventually absorb all the energy from your mouse trap racer and lead to it coming to rest. Higher energy output produces more heat and sound than smaller energy capacity. With all the speed traps of the competitors, the goal is to get to this finish line as quickly as possible and this means higher energy power rates. The perfect speed trap racer will be adapted to use all its initial potential energy as quickly as possible and long before the finish line. Competitors with speed traps will not be as effective and the friction forces will be much higher compared to long distance mice. Design your speed-trap racer to have high power. Design your mouse racer to get to it is at the highest speed as soon as possible. Bonus Tip: Design your racer with a speed trap to use all the energy before the finish line. Momentum is the resistance that an object needs to change in its state of movement, the more momentum an object has the more force that will be required for change, is a state of motion from the beginning. A heavy remedy for mice will require more towing force from lighter mice to achieve equal acceleration. Lighter mice will require less energy at startup and can use longer arms for greater pulling. Always use light components when building mice. Bonus Tip: Light vehicles with mice require less pulling power than the start point. Rotary inertia inertia is the resistance that the object needs to change its state of rotation. For an object that does not rotate, we often talk about its inertia or its mass; The larger the mass the object has, the more resistance the object will have to have a change in its state of movement. With rotational inertia, we are still talking about the mass of the objects, but the location of the mass in relation to the point of rotation. Greater distance between the average mass of the rotating object and the point of rotation means greater rotational inertia of the object inertia of rotation). The rotational inertia of the object has more torque, which will be required to change the state of rotation of the objects. A large amount of rotational inertia can take precedence after an object rotates, because it will be more difficult to stop the rotation. Having a wheel with a lot of rotational inertia can be a great advantage in building a long-distance mousetrap-driven car; but having a wheel with a large inertia inertia rotation is a disadvantage in building a speed trap. Mousetrap racers for Top-Speed If you are building a super-fast speed trap racer after rotary inertia is one of the most important concepts that you will need to understand. The secret of winning any high-speed mouse contest is to get to the finish line in less time than everyone else; What it really means is that you'll need to have more acceleration from the starting line than the rest of the race. Since most maximum speed contests take place at a certain distance friction is not as big a problem as in a maximum distance contest. In a contest for the highest speed momentum is the biggest problem that will need to appear mouse racer to be successful; for this reason, the wheels must be carefully selected so that they have as little momentum as possible. The first tip to remember is that large diameter wheels (more than 4 inches) will have a path to very rotational inertia and should be avoided at all costs; Try to limit the drive wheel size of a racer with a speed track to no more than 3 inches (depending on the travel distance). Wheels not in control must be as small and light as possible. Another important concept to think about when choosing wheels for your speed trap racer is traction. Since the drive wheel(s) will need to accelerate the racer as quickly as possible, the wheel will need to be able to pick up the surface of the road without slipping to the mouse trap racer to the finish. Some times wheel grip can be increased by adding grip treads cut out of the center of a rubber balloon (see adding grip protectors for more information). Before building your speed trap mice racer study the design of top fuel dragsters; their rear drive wheels are designed for maximum traction and their super light front wheels have almost no rotary inertia. Try to copy the design of the top fuel dragster when building a super-fast speed trap racer. Bonus Tip: Use light drive wheels no larger than 3 inches and small front wheels on each speed trap racer to reduce rotary inertia. Grip Acceleration of mouse trap vehicle will depend on the amount of grip or grip that the racer's wheels have on the floor. Thrust is a form of friction that allows the object to move. In order to move forward, your leg must be able to floor should be pushed backwards. This is the friction or grip between the bottom of the legs and the floor, which provides the grip you need to move. This is also the friction that exists between the road and the wheel, which protects the wheel from spinning, thereby moving the car along the road. Thrust is a major problem when it comes to building a super fast speed trap racer. If there is not enough traction between the drive system and the floor, then your mouse trap racer will not be able to accelerate as intended. Use drive wheels that provide a lot of traction on the floor. Bonus Tip: Use the drive wheels of racers with trap speed that have a lot of traction. Bonus Tip: We produce a special mouse-only wheel that is made of lightweight urea foam that will provide incredible traction on any surface, but also has very little rotary inertia. These wheels have been used on all our vehicles for recording setup. * Can't find what you're looking for? Ask Doc Physicists »

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