CHAPTER WORK AND ENERGY SECTION 2 SIMPLE MACHINES

What are the simple machines in Section 2? ? What are the six types of simple machines? lever, the pulley, the wheel and axle, the simple inclined plane, the wedge, and the screw. Simple machines are divided into two families: the lever family and the inclined plane family.

What are the two principal parts of all levers? The fulcrum is the pivot point, or the point about which the lever rotates. The lever has two “arms”: The load arm (or output arm) is the por- tion of the lever directly connected to the load. The effort arm (or arm of applied force) is the portion of the lever to which we apply the effort, or input force.

What does a machine do? Machines simply transmit mechanical work from one part of a device to another part. A machine produces force and controls the direction and the motion of force, but it cannot create energy. A machine's ability to do work is measured by two factors. These are (1) mechanical advantage and (2) efficiency.

Is it possible to get more work out of a machine than you put into it? You can never get more work out of a machine than you put into it. In fact, a machine always does less work on an object than the user does on the machine. That's because a machine must use some of the work put into it to overcome friction.

What are 2 simple machines?

What is simple machine for Basic 2? The definition of a simple machine is any device with little or no moving parts that are used to modify both the motion and magnitude of force applied to an object to perform work. There are six simple

machines: inclined planes, levers, wheel and axles, pullies, wedges, and screws.

Are there 3 types of levers? There are 3 classes of levers: first, second, and third-class levers. First-class levers are ones that have the fulcrum placed between the load and effort. Second-class levers are ones that have load in between the fulcrum and effort. Third-class levers are ones that have effort in between the fulcrum and load.

What is a Class 2 lever examples? A wheelbarrow, a person's jaw, and a bottle opener are examples of Class 2 levers. The fulcrum in this experiment is the end of the board on which the second friend is standing. Moving the sitting friend closer to the fulcrum lengthens the effort arm and increases the mechanical advantage.

How to calculate a lever? The Law of the Lever formula is (E)(R) = (L)(r), where E is the effort force, R is the lever arm connected to the effort, L is the load, and r is the lever arm connected to the load.

What does a lever do? A lever amplifies an input force to provide a greater output force, which is said to provide leverage, which is mechanical advantage gained in the system, equal to the ratio of the output force to the input force. As such, the lever is a mechanical advantage device, trading off force against movement.

What are 5 examples of simple machines? The simple machines are the inclined plane, lever, wedge, wheel and axle, pulley, and screw.

What is a machine simple answer? A simple machine is a mechanical device that changes the direction or magnitude of a force. In general, they can be defined as the simplest mechanisms that use mechanical advantage (also called leverage) to multiply force.

Is it possible to get more work out of a machine that you put in? A machine cannot increase the amount of energy you put into it. So, why is a simple machine useful? Although it cannot change the amount of work you do, a simple machine can change the amount of force you must apply to an object, and the distance over which you apply the force.

What are the advantages of a lever? Levers are used to multiply force, In other words, using a lever gives you greater force or power than the effort you put in. In a

lever, if the distance from the effort to the fulcrum is longer than the distance from the load to the fulcrum, this gives a greater mechanical advantage.

Which is not a simple machine? Expert-Verified Answer The scissor is not a simple machine. Because, The force direction change by a mechanical device is called a simple machine. The lever, screw , inclined plane, wheel, and axle, pulley, wedge, are six simple machines.

What is a machine for kids? A machine is a device that does a physical task. Some machines make moving or lifting things easier. Other machines carry people from place to place. Yet other machines help in building or making things.

How does a screw work? Screws do work by converting rotational motion into forward motion. We use screws primarily as a tool to hold two objects together. For example, you might use screws to hold the various pieces of a book shelf together. Screws hold objects together by driving forward into both of them, and remaining stuck in place.

How does a pulley help lift things? Well, pulleys help us by changing the direction of the force we use to lift an object. Is it easier for you to pull up on a rope or pull down on a rope? By using a pulley, we do not have to pull up on a rope to lift a heavy object attached to it, but instead we can pull down on it. Think of a flagpole as an example.

What is the velocity ratio? velocity ratio is The ratio of the distance moved by the point at which the effort is applied in a simple machine to the distance moved by the point at which the load is applied, in the same time. In the case of an ideal (frictionless and weightless) machine, velocity ratio = mechanical advantage.

What is the difference between a wheel and axle and a pulley? In a wheel and axle, the fulcrum is in the center. The outside rim of the wheel is like the handle of a lever; it just wraps all the way around. A pulley is just what it looks like, a wheel and axle with a groove to hold a rope around the outside edge.

What is the difference between a pulley and a lever? How is a lever different from a pulley? Levers and pulleys accomplish similar workload reductions but they function in different ways. A pulley uses a flexible rope or a cable across a wheel to

lift the load. A lever uses force on a pivot or fulcrum to accomplish the work.

What is a lever for kids? A lever is a long, sturdy body that rests on a support called a fulcrum. The fulcrum is the place where the lever pivots. It is one of the three parts or actions that work together in a lever. The load is the object that is being lifted or affected. In a seesaw, whoever is being lifted up is the load.

What is a class 2 lever? A second class lever (Class 2) refers to when the fulcrum is located at one end of the rigid bar, and the load is located between the effort and the fulcrum. Additionally, the load and effort move in the same direction. A great example of a second-class lever is a wheelbarrow.

What is the mechanical advantage of a Class 2 lever? The mechanical advantage of a class II levers is always more than 1, because. the effort arm is always longer than the load arm. the effort arm is always smaller than the load arm. the effort arm is always equal to the load arm.

What are machines for Class 2? Machine is any device that makes work easier. With the help of machines we can do work by expending less energy and force. Our body parts act as machines. For example, our arms can be thought of as a machine which can be used for lifting up objects easily.

What simple machines is a 2nd class lever? In a second class lever, the load is located between the effort and the fulcrum. If the load is closer to the fulcrum than the effort, then less effort will be required to move the load. If the load is closer to the effort than the fulcrum, then more effort will be required to move the load.

Which type of simple machine is the ramp in diagram 2? Ramps are a simple machine called an inclined plane. An inclined plane is any flat surface that is set at an angle. An inclined plane is different from other simple machines because it doesn't move like other simple machines. This simple machine makes work easier.

What are the types of simple machines Grade 2? A simple machine is a device used to make work easier. The six types of simple machines are: incline plane, wedge, screw, lever, wheel/axle, and pulley.

What are 5 examples of simple machines? Simple machines are useful because they reduce effort or extend the ability of people to perform tasks beyond their

normal capabilities. Simple machines that are widely used include the wheel and axle, pulley, inclined plane, screw, wedge and lever.

What is a machine simple answer? A simple machine is a mechanical device that changes the direction or magnitude of a force. In general, they can be defined as the simplest mechanisms that use mechanical advantage (also called leverage) to multiply force.

What is a machine example? Examples include: a wide range of vehicles, such as trains, automobiles, boats and airplanes; appliances in the home and office, including computers, building air handling and water handling systems; as well as farm machinery, machine tools and factory automation systems and robots.

What is an example of Class 2 lever? Give some examples of second class levers. Wheelbarrow, staplers, doors or gates, bottle openers, nutcracker, nail clippers, etc.

What are two examples of pulleys?

What is a lever for kids? A lever is a long, sturdy body that rests on a support called a fulcrum. The fulcrum is the place where the lever pivots. It is one of the three parts or actions that work together in a lever. The load is the object that is being lifted or affected. In a seesaw, whoever is being lifted up is the load.

What simple machine is a fan? A fan is another example of a wheel and axle. The fan blades (wheel) are attached to a rod (axle).

What is an example of a wedge simple machine? Wedges are simple machines that are used to provide a mechanical advantage. Wedges can be used for many purposes. For example, a wedge can be used to separate things, as in the cases of the fork, knife, grater, peeler, hatchet, zipper, scissors, spatula, ice cream scoop, apple corer, shovel, or chisel.

Is a seesaw a lever? Lever: The lever consists of a long beam and a pivot point, or fulcrum. A seesaw is an example of a lever.

What is a screw for kids? Screws are inserted into materials by rotation. Like nails, they are used to fasten pieces of solid material together. Some screws are used to hold machine parts together, either when one of the parts has a threaded hole or in

conjunction with a nut. Screws of this type include cap screws and machine screws.

What are the _____ types of simple machines? These are the six simple machines: wedge, wheel and axle, lever, inclined plane, screw, and pulley.

What is the difference between a pulley and a lever? A pulley uses a flexible rope or a cable across a wheel to lift the load. A lever uses force on a pivot or fulcrum to accomplish the work.

Student Exploration: Cell Energy Cycle Answer Key

1. What is the role of ATP in the cell?

- ATP provides the energy necessary for most cellular activities.

2. What is the purpose of glycolysis?

- Glycolysis breaks down glucose to produce ATP, NADH, and pyruvate.

3. Where does glycolysis occur in the cell?

- Glycolysis occurs in the cytoplasm.

4. What is the role of the Krebs cycle (citric acid cycle)?

- The Krebs cycle oxidizes acetyl-CoA to produce ATP, NADH, and FADH2.

5. Where does the Krebs cycle occur in the cell?

- The Krebs cycle occurs in the mitochondria.

6. What is the role of the electron transport chain (ETC)?

- The ETC uses the energy from NADH and FADH2 to pump protons across the mitochondrial membrane, creating an electrochemical gradient for ATP synthesis.

7. What is the role of oxidative phosphorylation in ATP production?

- Oxidative phosphorylation uses the electrochemical gradient created by the ETC to drive the synthesis of ATP.

8. What is the overall equation for cellular respiration?

- C6H12O6 + 6O2 ? 6CO2 + 6H2O + energy (as ATP)

9. How many ATP molecules are produced per glucose molecule during cellular respiration?

- About 36-38 ATP molecules are produced per glucose molecule.

10. What is the role of chemiosmosis in ATP synthesis?

- Chemiosmosis is the process by which the electrochemical gradient created by the ETC is used to drive ATP synthesis.

Sketchup 8 User Guide Tutorials

What is SketchUp 8 User Guide Tutorials?

Sketchup 8 User Guide Tutorials is a comprehensive guide that provides step-by-step instructions on how to use SketchUp 8, a popular 3D modeling software. It covers various aspects of the program, enabling users to create and manipulate 3D models effectively.

What types of tutorials are included?

The tutorials cover a wide range of topics, including:

- Creating and editing basic shapes
- Importing and exporting models
- Working with layers and groups
- Texturing and shading objects
- Creating and using components
- Rendering and exporting images

How can I access the tutorials?

The tutorials are available online in various formats, including PDFs, videos, and interactive online courses. Users can search for specific tutorials based on their needs or browse through the entire collection.

Who are these tutorials suitable for?

The tutorials are designed for users of all skill levels, from beginners to experienced modelers. They are particularly helpful for individuals who are new to SketchUp 8 or those who want to enhance their skills in specific areas.

What are the benefits of using SketchUp 8 User Guide Tutorials?

By utilizing the tutorials, users can:

- Quickly learn the basics of SketchUp 8
- Explore advanced features and techniques
- Improve their modeling skills and efficiency
- Create high-quality 3D models for a variety of purposes
- Enhance their understanding of the software's functionality

What is the natural frequencies of a uniform cantilever? The natural frequencies of a uniform cantilever beam are related to the roots ?i of the frequency equation f(?)=Cosh(?)Cos(?)+1=0 where ?4=(2?fi)2EImL3fi=ith natural frequency (cps)m= mass of the beam L= length of the beam E= Elasticity modulus I= Moment of inertia of the cross section Search the frequency (between 0 ...

What is the natural frequency of a cantilever beam? Natural Frequency of Cantilever Beam When given an excitation and left to vibrate on its own, the frequency at which a cantilever beam will oscillate is its natural frequency. This condition is called Free vibration. The value of natural frequency depends only on system parameters of mass and stiffness.

What are the mode shapes and natural frequencies? The special initial displacements of a system that cause it to vibrate harmonically are called `mode shapes' for the system. If a system has several natural frequencies, there is a

corresponding mode of vibration for each natural frequency.

What is the formula for the mode shape of a cantilever beam? The mode shapes ?n(x) of a cantilever beam are multiples of the function sinh?nz?sin?nz?cosh?n+cos?nsinh?n+sin?n(cosh?nz?cos?nz) where z=x/l and ?n are roots of the equation cos?=?cosh?1 Plot the first three mode shapes of the cantilever beam.

What are the factors that affect the frequency of a cantilever? The factors that affect the natural frequency of a cantilever beam include the orientation angle, length, width, thickness, modulus of elasticity, and density of the beam.

What is the formula for cantilever beam? The equation for the reaction at a fixed support of a cantilever beam is simply given by: Reaction Force in Y =Ry=P.

What is the cantilever rule for beams? The longer you hold it out, the more stress you begin to feel in your shoulder, and when you get very tired you start to lower your arm! Your arm parallels the natural gravity of cantilevered beams. An important rule of thumb for cantilevered beams is that they can extend 1/3 the length of the beam from the support.

How to calculate the natural frequency of a beam? For a simply supported beam with uniform stiffness and mass the natural frequency for the first mode is: pi/2 * sqrt ((E*I) / (m*L^4)), use a consistent set of units ant the result will be in Hz.

What is the difference between modal frequency and natural frequency? the natural frequencies of the system-there is one for each degree of freedom. These are also known as the modal frequencies; 2. the damping at each natural frequency (modal damping);

How to determine mode shape? The mode shape is determined by identifying the amplitude and phase of the FRF at the natural frequency for every DOF (point and direction) on the structure. The mode shape table can be saved and used for the next step of mode shape animation.

What is the natural frequency formula? I would like to ask you about the calculation formula for the natural frequency (f) of the compression spring. Generally, f=1/(2?)×?(k/m), but JIS B 2704, the formula is f=i/2×?(k/m) and this does not contain

?.

What are the shapes of cantilever beams? Cantilever beams are generally beams with one end fixed and the other end free. The length has a much larger dimension when compared with the width and depth. In addition, cantilever beams maybe straight or curved, with rectangular or circular cross sections.

What is the optimal shape of cantilever beam? Under the same beam volume or beam length, the triangular cantilever beam exhibited an approximately 7.1% lower material damping when compared to a rectangular cantilever beam. Further analysis shows that the triangular beam can also deliver a 21.7% higher power output than the rectangular beam.

What is the shape of the cantilever for uniformly distributed? This follows a parabolic shape.

How many natural frequencies does a cantilever beam have? Answer. Explanation: The first five natural frequencies of the cantilever beam considering the bending moment. However, the interval between the two frequencies for equal to zero and for unequal to zero is considerable, especially that between the two higher frequency numbers.

What are the failure modes of cantilever beam? The three types of possible cantilever failures: (a) shear failure (b) beam failure and (c) tensile failure.

How does the length of a cantilever affect frequency? The frequency is inversely proportional to the period. The longer a cantilever the more time it needs to return to its original location. The means a higher period and therefore a smaller frequency. That's why it's a misconception to increase the stiffness of structures to resist dynamic loads.

What is the natural frequency of a cantilever column? RE: Calculating Natural Frequency of cantilever column To obtain natural frequency divide the radian frequency by 2*pi.

What is the resonance frequency of a cantilever? The resonance frequency of an unloaded cantilever is determined by its elastic modulus, density and geometry. These properties are temperature dependent, so that the temperature also

influences the resonance frequency of cantilever beams causing shifts in the resonance frequency.

What is the natural frequency of an oscillating system? Natural frequency, measured in terms of eigenfrequency, is the rate at which an oscillatory system tends to oscillate in the absence of disturbance.

How do you find natural frequencies?

> *student exploration cell energy cycle answer key*, *sketchup 8 user guide tutorials*, *natural frequencies and mode shapes of a nonlinear uniform cantilevered beam*

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