

MACHINES

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1. Main objectives:

1. To understand how simple and compound machines work.
2. To identify some machines which are useful to humans.
3. To be able to construct a simple and a compound machine.
4. To realise the advantages of new technologies in a Changing World.

2. Useful websites.

www.edheads.org/activities/simple-machines

Interactive site where children can learn about simple machines. There is an explanation after each question.

www.edheads.org/activities/odd_machine/index.htm

Interactive site with activities about compound machines. There is an explanation after each question.

<http://teacher.scholastic.com/dirtrep/simple/index.htm>

Children will learn to investigate, observe and write a report about machines. Information about simple machines.

www.mos.org/sln/Leonardo/InventorsToolbox.html

Information about the elements of the machines and how they make the machine work.

www.school-for-champions.com/science/machines.htm

Uses of machines in the history and a final mini-quiz. Examples of simple machines and how they work.

MACHINES

simple
machines

compound
machines

wedge

screw

inclined plane

lever

roller

ramp

pulley

push

pull

friction

gravity

force

gear

axle

engine

tool

wheel

<p>simple machine</p>	<p>n. instrument or apparatus with few or no moving parts, which uses power to perform work.</p> <p>"Pulleys and levers are simple machines."</p>
<p>compound machine</p>	<p>n. instrument made with simple machines which uses power to perform work.</p> <p>"Bicycles and clocks are compound machines."</p>
<p>wedge</p>	<p>n. piece of a hard material with V-shaped edge, one end being thin and the other wide, used for making space or filling a space.</p> <p>" Put a wedge in the door so it will stay open."</p>

<p>screw</p>	<p>v. turn or tighten. Rotate (something) so as to attach or remove it by means of a spiral thread.</p> <p>"Screw the two pipes together end to end."</p>
<p>inclined plane</p>	<p>n. sloping surface, such as a ramp. It is used to move objects. The object must be moved a longer distance than if it was lifted straight up, but less force is needed.</p> <p>"A ramp is an example of inclined plane."</p>
<p>lever</p>	<p>n. bar or other strong tool used for lifting or moving something heavy. One end is placed under the object, and the other end is pushed down strongly.</p> <p>"Levers are simple machines."</p>

<p>roller</p>	<p>n. machine used for moving heavy things that have no wheels.</p> <p>"They pushed the boat down to the water on rollers."</p>
<p>ramp</p>	<p>n. artificial slope that connects two levels.</p> <p>"Can you ride the bicycle up the ramp?"</p>
<p>pulley</p>	<p>n apparatus consisting of a wheel over which a rope can be moved, used for lifting heavy things.</p> <p>" We will use a pulley to lift this piano."</p>

<p>push</p>	<p>v. to use force in order to move something forward, away from oneself, or to a different position.</p> <p>"He pushed me and I fell into the water."</p>
<p>pull</p>	<p>v. to use force in order to move something towards oneself or in the direction of the force.</p> <p>"Help me move the piano, you push and I will pull."</p>
<p>friction</p>	<p>n. a force that tries to stop one surface sliding over another.</p> <p>"He pushed the box down the slope, but friction caused it to slow down and stop."</p>

<p>gravity</p>	<p>n. natural force by which objects are attracted to each other, especially that by which a large mass pulls a smaller one to it.</p> <p>"Anything that is dropped falls towards the ground because of the force of gravity."</p>
<p>force</p>	<p>n. power that may produce changes or movement in a body or object on which it acts.</p> <p>" The force of gravity makes things fall to earth."</p>
<p>gear</p>	<p>n. apparatus consisting of a set of toothed wheels, that allows power to be passed from one part of a machine to another.</p> <p>" Most cars have five forward gears."</p>

<p>axle</p>	<p>n. bar with a wheel on either end, around which the wheels turn, as on a car.</p> <p>"Bicycles and cars use axles."</p>
<p>engine</p>	<p>n. machine with moving parts which changes power from electricity, oil... into movement.</p> <p>" The engine of a car is a compound machine."</p>
<p>tool</p>	<p>n. simple instrument that is held in the hands, and used for doing special jobs, such as a hammer, spade, screwdriver...</p> <p>"Carpenters use a lot of tools."</p>

wheel

n. circular object with an outer frame which turns round and inner part to which is joined, and used for making things move.

"Most cars have three wheels."

MACHINES

5. Glossary.

axle: n. a bar with a wheel on either end, around which the wheels turn, as on a car.

compound machine: n. instrument made with simple machines which uses power to perform work.

engine: n. machine with moving parts which changes power from electricity, oil... into movement.

force: n. power that may produce changes or movement in a body or object on which it acts.

friction: n. force that tries to stop one surface sliding over another.

gear: n. apparatus consisting of a set of toothed wheels, that allows power to be passed from one part of a machine to another.

gravity: n. natural force by which objects are attracted to each other, especially that by which a large mass pulls a smaller on to it.

inclined plane: n. sloping surface, such as a ramp. It is used to move objects. The object must be moved a longer distance than if it was lifted straight up, but less force is needed.

lever: n. bar or other strong tool used for lifting or moving something heavy. One end is placed under the object, and the other end is pushed down strongly.

pull: v. to use force in order to move something towards oneself or in the direction of the force.

pulley: n. apparatus consisting of a wheel over which a rope can be moved, used for lifting heavy things.

push: v. to use force in order to move something forward, away from oneself, or to a different position.

ramp: n. artificial slope that connects two levels.

roller: n. machine used for moving heavy things that have no wheels.

screw: v. to turn or tighten. Rotate (something) so as to attach or remove it by means of a spiral thread.

simple machine: n. instrument or apparatus with few or no moving parts, which uses power to perform work.

tool: n. simple instrument that is held in the hands, and used for doing special jobs, such as a hammer, spade, screwdriver...

wedge: n. piece of a hard material with a V-shaped edge, one end being thin and the other wide, used for making space or filling a space.

wheel: n. circular object with an outer frame which turns round and inner to which is joined, and used for making things move.

What is a
simple
machine?

What is a
compound
machine?

How do
pulleys
work?

Why are
machines
useful for
humans?

What is a
force?

What is
friction?

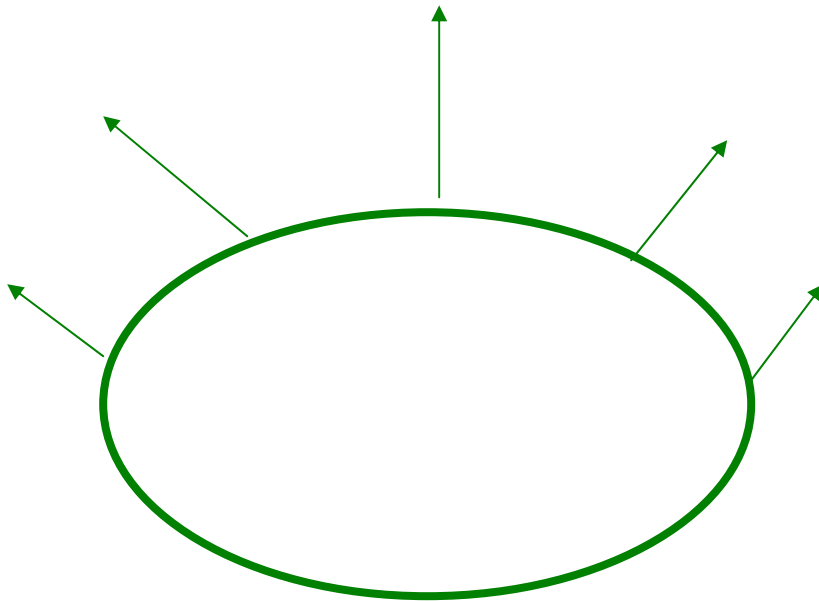
How do
inclined
planes
work?

How do
levers
work?

What is a
tool?

Write five facts you know about machines.

Add more arrows if you need more.



Hands on activity

HOW TO MAKE A PULLEY

- Objectives:

To realise how a pulley works.

To appreciate the importance of pulleys for humans.

- Introduction.

In this activity, children will make a single pulley and a double pulley. They will realise that using a pulley saves effort when lifting heavy objects.

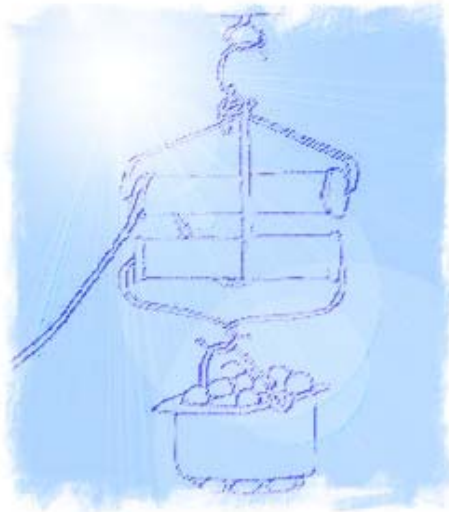
You will need:

- Yoghurt pots
- Marbles
- Thread reels
- String
- Wire
- Pliers
- Eye hook

Hands on activity

Procedures.

1. Take some wire and push it through the hole of the reel. Cut it with the pliers and twist the wire. Remember that we need it to finish in a hook. When you have done this, hang it from the eye hook that you have fixed previously on a high place (you can fix it to the roof, shelves or even hold it with your hand).
2. Now, you have to make a handle for the yoghurt pot with the wire. Then, loop the string over the pulley and tie it to the yoghurt pot. Place some marbles in the yoghurt pot.
3. Finally, pull down the string and you will see how easily you can lift the marbles.



Hands on activity

Once children have realised that pulleys help us lift heavy objects with little effort, we will make a double pulley.

Step number 1 is the same as in the single pulley, but now we need two reels with the hook. One goes to the eye hook and the other will go to the handle of the yoghurt pot.

2. Take one end of the string and tie it to the top of the wire, as you can see in the picture. Loop the string under the lower pulley and back it up over the top of the other pulley.

3. Ask pupils whether they think that it will be easier now. Then, put the marbles in the yoghurt pot and hang it on the hook of the lower pulley.

COMPUTERS



Almost every home, office or school, has a **computer** of some kind these days. **Computers** are a great advantage and a very useful tool for most people.

Computers are necessary at schools. They can help pupils to look for specific information about any topic; they help to revise vocabulary or grammar structures for exams and make subjects more interesting. People save a lot of time using **computers**. Nowadays, you can book tickets for any place in advance thanks to Internet. You can buy anything you need: food, music, furniture, books... You can chat to your friends in a very easy way, while you are having a look at the newspaper on your screen. Thanks to the e-mail you can send videos, photos or any other files to any country of the world. You can even take it with you in your holidays!

Since the first **computer** was sold, they have changed a lot. Today, you can find **computers** of all prices, sizes and colours. Everyone can

find one which suits them, but not everybody is able to use them properly.

Computers are a very important tool in our society and their use is constantly increasing. Everybody should take this into account, because **computers** are the future, and the future is already here.



Answer the following questions:

1. How can computers help you when you have to study?

2. Imagine that your best friend is living in England. How would you use the computer in this case?

3. Write true (T) or false (F).

All computers are very expensive.

The use of computers is rising each year.

Computers have not changed very much.

You can buy cinema tickets with your computer.

4. In the text it says: "You can even take it with you in your holidays!". What does that mean?

5. Write about different things you do with your computer during the week.

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-
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THE IMPORTANCE OF MACHINES.



Machines have always been useful for humans. Before electricity or engines were invented, we had to do everything by ourselves. All over the history machines have been important.

Simple machines were used in Egypt to build the pyramids. They used very big blocks of stone, and they could not move them just pushing. They used levers to pick them up and rollers and ramps (inclined plane) to move them from one place to another.

Romans used levers (catapults) to throw stones at the enemy's army. They moved the catapults using rollers.

Today, when we have a broken leg, we use a very simple, but very useful machine, such as the crutches. We still use simple machines, but the most important thing is that by using them, we have made compound machines that have made our life easier.

We cannot imagine our present life without machines. Think how much your life could change without phones, computers, cars, radio or TV.

Answer the following questions:

1. What simple machines did Egyptians use?

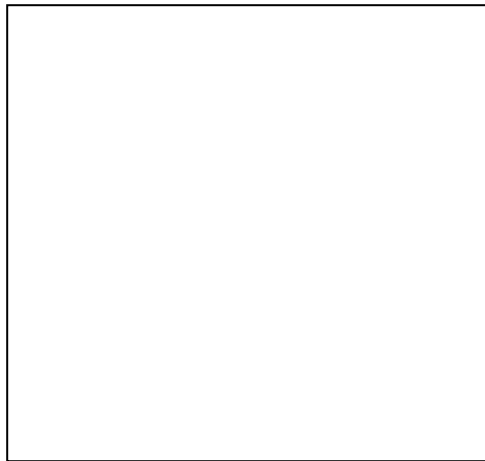
2. Why are simple machines important in our society?

3. Write the following words in the correct box.

Radio-lever-inclined plane-ramp- phone-roller-crutches-car-

Simple machines.

Compound machines.

A large empty rectangular box with a black border, intended for writing the words from the list that are simple machines.A large empty rectangular box with a black border, intended for writing the words from the list that are compound machines.

4. Think for a few minutes and make a list of all machines you use in a day.

A series of ten horizontal lines spaced evenly down the page, providing a space for the student to write a list of machines used in a day.

5. If machines would not exist, would your life change a lot?

Why?
