

NOTE: In the PowerPoints in Moodle you will find the information to answer these activities

Unit: Metals

1.- Write True (T) or False (F) at the end of the sentences:

- a) steel is malleable
- b) steel is more flexible than cast iron
- c) steel is cheaper than iron
- d) steel is more resistant than to tensional forces than cast iron
- e) steel is not tough

2.- Draw a sketch of a blast furnace and label what comes in a what comes out.

3.- What is an alloy? Name four examples of alloys.

4.- Define **metalworking** and make a diagram of its 4 most important processes.

Unit 8 : Structures

1.- Fill the grid with several elements of each type of structure:

| type of structure | elements of each type of structure | 2 examples |
|-------------------|------------------------------------|------------|
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| | | |
| | | |

2.- True or false?

- a) Torsion makes an element bend
- b) Buckling is a consequence of compression forces.....
- c) Shear forces make one part of the element slide over the other.....
- d) Tension is the force that squeezes an element.....
- e) Compression is the force that is applied to the legs of a table

3.- Explain the types of unions (permanent and non-permanents), their uses and some examples of each type.

4.- Give short (but good) answers:

- a) When would you use permanent unions?
- b) write 3 (at least) structural elements of a house:
- c) what is the “key stone”?
- d) what is the disadvantage of a frame structure?
- e) Two methods to make a union permanent:

Unit: Mechanisms

1.- Fill the grid with several elements of each type of structure:

| type of mechanism | elements of each type of mechanism | 2 examples |
|-------------------|------------------------------------|------------|
| | | |
| | | |
| | | |
| | | |

2.- Fill the grid with the three types of levers and where their elements are located and give examples.

| type of lever | elements of each type of lever | 2 examples |
|---------------|--------------------------------|------------|
| | | |
| | | |
| | | |

3.- a) In a lever, the effort arm is 6 m and the load arm is 2m. Calculate the effort to move a load of 12 N.

3.- b) Calculate the effort arm in a lever, when the load is 450N, the load arm is 1m and the effort is 100N.

4.- Answer True (T) or False (F) at the end of the lines:

- a) Belts usually have three wheels
- b) Gears can transmit more power than belts
- c) Brakes work by friction
- d) When mechanisms reduce the speed, they usually increase the load
- e) The driver wheel is usually connected to the engine

Unit: Electrical circuits

1.- Short questions:

- a) What is electricity?
- b) Which are the three basic elements of an electric circuit?
- c) What is the purpose of an electrical circuit?

2.- Fill the grid about the applications of electricity.

| type of application | How is the conversion done? | 2 examples of devices |
|---------------------|-----------------------------|-----------------------|
| | | |
| | | |
| | | |

3.- Draw a circuit diagram with 2 batteries connected in series, 3 bulbs (2 connected in parallel to the other one), a switch and a motor.

4.a) The light of a torch has a resistance of five ohms. We put a new battery in the torch that gives twenty five volts. What is the value of the current?

4.b) What is the value of the tension provided by the battery if the resistance is 3 ohms and the current 5 amp.

Unit: Non-renewable sources of energy

1.- True or false?

- a) Uranium is the semi-decomposed remains of dead plants
- b) Uranium leaves residues that are radioactive for 15.000years

- a) Uranium liberates energy when we burn it.
- b) When distilling crude oil, heavier molecules evaporate easier.
- c) Hydrocarbon molecules are hydrogen atoms and carbon atoms linked together in "chains".

2.- Write the four types of coal in order according to their content of carbon atoms and their age. Also write the processes involved in transforming plants and trees into coal.

3.- Why are fossil fuels an environmental problem?

4.- Name the advantages and disadvantages of natural gas.

| advantages | disadvantages |
|------------|---------------|
| | |
| | |

Unit: Renewable sources of energy

1.- Fill in the gaps **about hydro-electric dams:** (10 points)

- Hydroelectric power is o.....
- The first hydro-electric power station was at
- Hydroelectric power is the most common r energy.

- The dam a..... water and r..... the water level in the valley.
- This water through a tube to the dam.
- Before exiting the tube, the water passes through a & makes it
- Then the turbine moves an electric

2.- About the renewable sources of energy (10 points)

| 4 advantages | 2 disadvantages |
|--------------|-----------------|
| | |

3.- Name the parts of the wind turbine and explain their function.

4.- Draw a sketch of a hydroelectric dam and label, at least, 5 of its elements.