

JSS 3 BASIC TECHNOLOGY NOTES

MACHINES

Definitions:

A machine is an equipment, which man uses to make his work faster, easier, more accurate and at low cost.

The world we live in today has come to the point where man can no longer live without machines. In a better sense, we can safely say that mankind and machines have become married to each other that they can hardly be separated. This is the reason why we have to study to know more about it.

Types of machines:

Although at this level of learning, you are expected to learn about two main types of machines namely simple and complex machines, there are actually three known types of machines. These are briefly stated and explained below:

1. **Simple Machine:** This is a machine type that does not require any engine, electrical and or electronic system for it to work. It is purely mechanical, requiring only human hands, legs or other body parts to work. E.g. Scissors, knife, pen, wheelbarrow, pliers, hammer, crowbar, mallet, hoe, cutlass, bicycle, etc.
2. **Compound Machine:** This type of machine requires an engine, mechanical system, and or some electrical systems to work. Some examples of compound machines are: fan, washing machine, motorcycle, electric pressing iron, mixer, toaster, barbing machine, roller coaster, elevator, etc.
3. **Complex machine:** This is a type of machine which has mechanical systems, electrical, electronic and an engine system in it. Examples of this type of machine included: train, aircraft, vehicle, ship, computers, phones, radio set, scanner, X-ray machine, telescope, etc.

Mechanical Advantage (M.A.):

This is a technical term that is used to know the amount of value a machine can give to man. Numbers are used to know how beneficial a machine is to man. This benefit or value is actually based on the amount of energy, power or effort that man has to put into a machine for it to work for man. The smaller the number, the greater the effort; and the bigger the number, the smaller the effort man applies. Mechanical Advantage is calculated by using the mathematical formula below:

$$\text{Mechanical Advantage (M.A.)} = \frac{\text{Load}}{\text{Effort}}, - - - - - (1)$$

Example problem: Two machines are expected to lift a load of 350N. If the force machine A applied to lift it is 75N and machine B used a force of 105N to do the same, (a) calculate the mechanical advantages for each of the machines? (b) Which of the machines is more efficient?

Supplementary

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