Simple Mechanics

Unit 3
Session 2

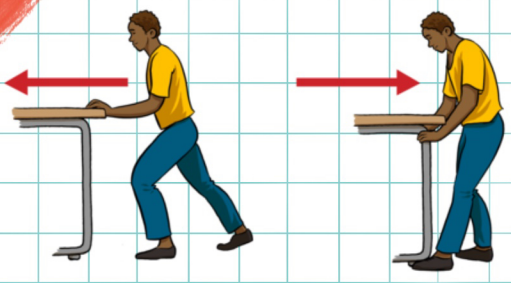
Introduction
- Work
- Energy
- Power
- Force Frequency and Torque

1) What is a Mechanical Tool?
2) What is the flow of work, energy, or power?
3) How to use tools safely?

Lesson Aims:
1. Exploration of Work Energy Power concepts.
2. Realization of tool force and tool torque.
3. Analysis of mechanical tools applications and working.

THOUGHTS AND QUESTIONS

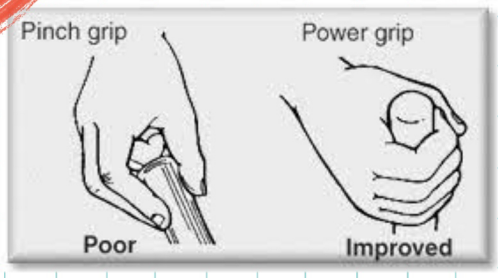
- Relation of work , displacement and its relation with a simulation. Take an example of pulling and pushing anything around you. For example a table, when you pull/ push a table to a certain force it will not move.
- Introduce the roll of friction and how work done will be zero in this case.
- An example of a water bottle and cap screw arrangement. Visualize the roll of the right type of force (torque in this case) for the right type of action to be performed.
- A tool is a machine for handling or machining metal or other rigid materials, usually by cutting, boring, grinding, shearing, or other forms of deformations. Machine tools employ some sort of tool that does the cutting or shaping.



MECHANICAL TOOL HANDLING

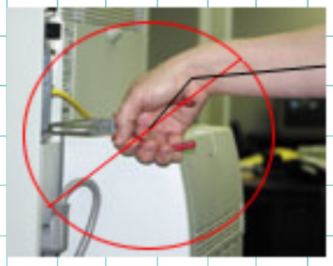
1) Know you job: Before you select a tool, think about the job you will be doing. Tools are designed for specific purposes. Using a tool for something other than its intended purpose often damages the tool and could cause you pain, discomfort, or injury. You reduce your chances of being injured when you select a tool that fits the job you will be doing. Use Reference [5] by scanning the QR code given at the last.

2) Look at your workplace: Awkward postures may cause you to use more force. Select a tool that can be used within the space available. For example, if you work in a cramped area and high force is required, select a tool that is held with a power grip. Use Reference [6] by scanning the QR code given at the last.



3) Improve Your Work Posture: Awkward postures make more demands on your body. In some cases, the placement of the workpiece will affect your shoulder, elbow, wrist, hand, or back posture. Whenever possible, choose a tool that requires the least continuous force and can be used without awkward postures. The right tool will help you to minimize pain and fatigue by keeping your neck, shoulders, and back relaxed and your arms at your sides.Use Reference [7] by scanning the QR code given at the last.

4) Select the Tool: Over time, exposure to awkward postures or harmful contact pressures can contribute to an injury. You can reduce your risk of injury if you select hand tools that fit your hand and the job you are doing .Use Reference [8]



ACTIVITY

1) Take different drill machines and grinder and screwdriver set tools to students and their handling guides
2) Divide the class into pairs.
3) Each pair gives a different kinematic pair
4) Rotate each pair for every assignment

REFLECTION

FOR MORE INFORMATION -

1) What are the cases where work done is zero?
2) Why is energy conversion required?
3) What are the 3 main functions of a machine tool?
4) What are the types of machine tools?
5) What are tools and machines?
6) What are the 3 main functions of a machine tool?