

**Concept**: This document will guide you on “how to follow sequence/order” of the topics covered in Basic Engineering concepts module. Additionally refer the productive tasks in this document for each topic.

**Tools**: Measuring Tape, Varnier calliper, and screw gauge

**Class-Age Group**: 12 + years

*Open Education Resource*

**Basic Engineering concepts**

**Resources**

Follow the below **topic sequence** from 1-7 and their associated **resources**

(PPT: Power Point presentations, Documents and Video clips)

|  |  |  |
| --- | --- | --- |
|  |   | **Resources for topics**  |
| **Topic Sequence**  | **Topic** | **PPT Name** | **Document**  | **Video Clip** |
| 1 | Measurement | Measurement basics/Measurements - Tools | Measurements-Tools.docMEASUREMENT 1.0 |   |
| 2 |     MASS & wt  | Engineering concepts 1 | Basic engineering concepts 2.0 |   |
|   |   Force | Engineering concepts 1 Forces | -Technology in Cricket - Super Slow Motion 1 and 2-- - YouTube |
| 3 |      Torque | Engineering concepts 2 |   |
|   |     Work | Engineering concepts 2 |   |
|   |      Power  | Engineering concepts 2 |   |
|   |      friction and lubrication  | Engineering concepts 2 |   |
| 4 |     Scalar and vector  | Engineering concepts 3 |   |
| 5 |   Energy  | Engineering concepts 4 |   |
| 6 |    Mass and Energy  | Engineering concepts 5 |   |   |
| 7 |       Simple machines – lever / pulley / wedge / screw / screw jack / gears / | Simple machines- slope.pptxSimple machines-Lever.pptxSimple machines-Pulleys.pptSimple machines-Screw.pptSimple machines-wedge.pptxSimple machines-Wheel.pptx | machines 3.0 |   |

**Productive task Topic 1: Measurements**

1. Using three measuring instruments (measuring tape, calliper and screw gauge) try to measure gauge of same object (for example gauge of your finger) and note down the readings. Once done check the readings to understand which instrument give more precise readings. Try with multiple objects. It will help to understand limitations of each instrument
2. Measure an object using two/three different callipers or screw gauges or tapes. Check if three different callipers or tape gives same result? Learn about removing zero error from the measuring instruments.
3. Measure depth of the deep hole using Vernier calliper
4. If you do not have any measuring instrument then how will you measure depth or length of an object? Observe it how carpenter does it when he do not have a tape????
5. Check how mother/sister measures ingredients in kitchen

**Productive task Topic 2: Mass , Weight and Force**

1. Drop a bird feather from 10 feet and then drop a ball from 10 feet. Observe the time it takes to touch the ground. Why the time is not same in both the cases and does it because of mass or weight?

**Productive task Topic 3: Torque, work, power, Friction and lubrication**

1. List 5 cases where you have observed the advantages of friction.
2. List at least 5 cases where you see disadvantages of friction and how can you overcome those disadvantages?
3. Find out things around you where torque is applied.

**Productive task Topic 4: Scalar and vector**

1. Find out whether below quantities is either scalar or vector and explain why?

|  |
| --- |
| **Quantity** |
| a. 5 m |
| b. 30 m/sec, East |
| c. 5 mi., North |
| d. 20 degrees Celsius |
| e. 256 bytes |
| f. 4000 Calories |

**Productive task Topic 5: Energy**

1. Find out which all types of energies your body generates or uses?
2. Find out and list energy types used in kitchen

**Productive task Topic 6: Mass and Energy**

State the law of conservation of energy

**Productive task 7: Simple machine**

1. Try and create a simple machine using material available in your home which demonstrate the lever, pulley, wedge, wheel...etc