5 Force and Simple Machines

LESSON PLAN

SPECIFIC OBJECTIVES

The students learn about

- concept of force and the changes a force can bring in an object
- types of force
- machines and their types
- lever and its types
- pulley, inclined plane, wheel and axle, wedge and screw

TEACHING AIDS

Pictures/animation on a child/person pushing, pulling an object; making an object move, stopping a moving object, changing the direction of a moving object, lowering the speed, raising the speed of an object, changing the shape and size of an object; muscular, gravitational, frictional, elastic, mechanical and buoyant forces; pulley, inclined plane, wheel and axle, wedge and screw; levers of first, second and third class (as given in chapter)

LESSON PLAN

- The teacher will start the chapter with 'Warm Up' section by asking some simple questions on force and machines based on previous knowledge of students.
- With the help of teaching aids, teacher will explain the concept of force that it is a pull or push that brings a change in an object, and will discuss the effects of force on an object.
- With the help of teaching aids, teacher will explain different types of forces and their effects (as given in chapter).
- Now, to check the understanding of students about the topic, teacher will ask them to solve 'Checkpoint 1'.
- Now, teacher will discuss how machines make our work easier and explain the two types of machines by showing their pictures (as given in chapter).
- With the help of teaching aids and suitable examples, teacher will explain types of simple machines (as given in chapter).
  - Teacher will define lever, its fulcrum, load and effort, and explain its uses and types, i.e., levers of first, second and third class (as given in chapter).
  - Teacher will describe pulley, its types and uses.
  - With suitable examples, teacher will explain an inclined plane and its uses.
  - Teacher will explain how wheel and axle reduce the workload.
  - Teacher will define a wedge, its features and uses.
  - Teacher will explain the formation of screw that it is like wrapping of an inclined plane around a rod.

- ✧ Now teacher will ask students to solve ‘Checkpoint 2’.
- ✧ The teacher will sum up the chapter by going through the points given under the head 'At One Go'.
- ✧ Finally, the teacher will help students to solve all the exercises given under the head 'Check Your Study'.

BOOST UP

- ✧ Teacher should explain the type of forces by demonstrating some acts given in the chapter such as stretching of rubberband, rolling of ball, floating of ball in water. Teacher should give some other examples apart from those given in the chapter.
- ✧ Teacher should demostrate Activity 1 given under the head ‘lever’.
- ✧ Teacher should demonstrate the working of a pulley.
- ✧ Teacher should perform Activity 2 given under the head ‘inclined plane’.
- ✧ Teacher should display some of the simple machines and their working.
- ✧ Students should be encouraged to explore the places or fields where these simple machines are used.

EXPECTED LEARNING OUTCOMES

The students

- ✧ understand the concept of force and its possible effects.
- ✧ know the types of forces.
- ✧ know about simple machines and their applications in various fields.

EVALUATIVE QUESTIONS

The teacher may ask the following questions for evaluating the understanding of students:

1. What possible changes can a force bring in an object?
2. Which force is applied with the help of muscles?
3. Name the force applied by a machine.
4. Which force makes things float in water?
5. How do machines make the work easier?
6. What is a complex machine?
7. What is a lever?
8. What are fulcrum, load and effort of a lever?
9. In which class of lever is load between fulcrum and effort?
10. What is a pulley?
11. What is a wedge?
12. What is a screw?