2.Simple Meachines

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

1. What is the primary function of a lever?
A) To change the speed of an object
B) To lift heavy loads with less effort
C) To change the direction of motion
D) To reduce friction
Solution: B
Solution: Levers help lift heavy loads with less effort.

2. In which type of lever is the fulcrum positioned between the effort and the load?
A) SecondClass Lever
B) FirstClass Lever
C) ThirdClass Lever
D) None of the above
Solution: B
Solution: In a firstclass lever, the fulcrum is between the load and effort.

3. Why are ramps considered safer than lifting heavy objects directly?
A) They allow for faster movement
B) They eliminate effort
C) They provide stability
D) They reduce the amount of effort needed
Solution: D
Solution: Inclined planes reduce the effort needed to lift objects.

4. If you double the length of an inclined plane, how does it affect the force required to lift a load?
A) Halved
B) Doubled
C) Stays the same
D) Quadrupled
Solution: A
Solution: Longer ramps require less effort to lift objects.

5. Which simple machine consists of a wheel with a groove?
A) Lever
B) Inclined Plane
C) Pulley
D) Screw
Solution: C
Solution: Pulleys use a grooved wheel to guide rope and lift loads.

ADVANCED LEVEL

More than One Answer Type

6. Which are benefits of using inclined planes?
A) Increase effort
B) Safer load movement
C) Reduced effort
D) Only used in construction
Solution: B, C

Solution: Inclined planes reduce effort and improve safety.

7. Which statements are true about screws?

A) Inclined plane on cylinder B) Only hold objects
C) Convert rotation to linear motion D) Lift objects
Solution: A, C, D
Solution: Screws convert motion and multiply force.

Fill in the Blanks

8. In a secondclass lever, the _____ is between the fulcrum and the effort.
Solution: Load
Solution: Secondclass levers follow Fulcrum–Load–Effort order.

9. A _____ is used to split, cut, or lift objects and tapers to a sharp edge.
Solution: Wedge
Solution: Wedges split and cut objects using force.

Matching Type

10. Match each type of lever with its correct description.
1C, 2B, 3D, 4A
Solution: 1C, 2B, 3D, 4A
Solution: Each matches the correct function or example.

Answer the Following

11. How does the lever design impact efficiency?
Solution: Changing fulcrum and arm length reduces effort
Solution: Longer effort arms increase lifting advantage.

12. How do simple machines apply to modern technology?
Solution: They reduce effort and improve efficiency in machines
Solution: Used in robotics and tools to save energy and make work easier.

LEARNERS TASK

Multiple Choice Questions

1. Which is an example of a secondclass lever?

A) Tweezers B) Seesaw C) Wheelbarrow D) Pliers
Solution: C
Solution: Wheelbarrow places the load between fulcrum and effort.

2. An inclined plane allows you to lift an object by:

A) Lifting upward B) Increasing angle
C) Spreading effort D) Reducing weight

Solution: C
Solution: It reduces effort by increasing distance.

3. What is a common example of a wedge?
A) Ramp B) Knife C) Pulley D) Wheelbarrow
Solution: B
Solution: Knives cut using wedge shape.

4. When using a screw, motion is converted from:
A) Linear to rotational B) Rotational to linear
C) Horizontal to vertical D) Vertical to horizontal
Solution: B
Solution: Turning a screw moves it forward linearly.

5. What type of lever requires the most effort?
A) FirstClass B) SecondClass C) ThirdClass D) All equal
Solution: C
Solution: Effort is closer to fulcrum, needing more force.

ADVANCED LEVEL

6. Which are types of simple machines?
A) Lever B) Battery C) Wedge D) Inclined Plane
Solution: A, C, D
Solution: Battery is not a simple machine.

7. Which are examples of inclined planes?
A) Wheelbarrow B) Ramp C) Stairs D) Flagpole
Solution: B, C
Solution: Both offer sloped surfaces for lifting.

Fill in the Blanks

8. An _____ is a flat surface tilted to lift heavy objects more easily.
Solution: inclined plane
Solution: It spreads work over a longer distance.

9. A _____ has a wheel with a groove to change direction of force.
Solution: pulley
Solution: Used for lifting loads more efficiently.

Matching Type

10. Match each simple machine with its example.
1E, 2D, 3C, 4A, 5B
Solution: 1E, 2D, 3C, 4A, 5B

Solution: Each example matches its machine type.

Answer the Following

11. How can inclined planes be used in architecture or planning?
Solution: By adding ramps to improve accessibility
Solution: They help wheelchairs, strollers, and people move easily.

12. What environmental considerations arise when using ramps?
Solution: Use proper materials and slope to avoid land damage
Solution: Prevents erosion and supports sustainable construction.

TEACHING TASK

Multiple Choice Questions

1. What is the primary purpose of a screw?
A) To lift heavy objects B) To fasten materials together
C) To cut through materials D) To change the direction of force
Solution: B
Explanation: Screws are mainly used to fasten or join materials.

2. Which of the following best describes how a wedge works?
A) Rotates to create motion
B) Converts rotation into linear motion
C) Splits or cuts materials by force on wide end
D) Amplifies force on axle
Solution: C
Explanation: Wedges split materials by applying force to a wider end.

3. In a wheel and axle system, what role does the axle play?
A) Pivot point
B) Converts linear to rotational
C) Rotates with wheel for movement
D) Provides stability
Solution : C
Explanation: Both wheel and axle rotate together for movement.

4. What type of screw is designed for fastening metal parts?
A) Wood Screw B) Machine Screw C) Jar Lid D) Corkscrew
Solution: B
Explanation: Machine screws are made for metal fastening.

5. How does a pulley make lifting easier?
A) Increases load weight B) Changes direction of force

C) Provides flat pushing surface D) Increases wheel size
Solution: B
Explanation: Pulleys lift loads by changing force direction.

More Than One Answer Type

6. Wheel and axle – true statements:
A) Reduces friction B) Same size objects
C) Wheel rotates around axle D) Used in bicycles & doorknobs
Solution: A, C, D
Explanation: Wheel & axle reduces friction and creates easier motion.

7. Characteristics of wedges:
A) Cut materials B) Only vertical use
C) Require less effort D) Found in many tools
Solution: A, C, D
Explanation: Wedges cut/split with less effort in multiple tools.

Fill in the Blanks

8. Pulleys can be combined in a system known as a _____.
Solution: block and tackle
Explanation: Block & tackle lifts heavy loads with less force.

9. An example of a wedge is an _____.
Solution: axe
Explanation: An axe splits wood like a wedge.

Matching Type

10. Match the following:

10. Match each simple machine with its correct example.

Column A	Column B
1. Screw	A. Axe
2. Wedge	B. Doorknob
3. Wheel and Axle	C. Jar Lid
4. Pulley	D. Flagpole

Solution: 1-C, 2-A, 3-B, 4-D
Explanation: Each example fits the correct simple machine type.

Answer the Following

11. How do pulleys improve safety and efficiency?
Solution: By reducing lifting force and preventing injury
Explanation: Pulleys let workers lift heavy loads with less strength and strain.

12. Factors when choosing screws vs nails:
Solution: Material type, strength needed, permanence
Explanation: Screws are stronger & removable; nails are faster & flexible.

LEARNERS TASK

Multiple Choice Questions

1. Which is NOT a wedge?
A) Axe B) Knife C) Bicycle D) Chisel
Solution: C
Explanation: A bicycle is wheel & axle, not a wedge.

2. When using a corkscrew, what principle is used?
A) Inclined plane B) Lever C) Screw D) Wedge
Solution: C
Explanation: Corkscrews rotate to move downward like a screw.

3. Benefit of wheels and axles:
A) More effort
B) Increase friction
C) Reduce friction for easier movement
D) No force needed
Solution: C
Explanation: They reduce friction so objects move easier.

4. Advantage of multiple pulleys in block & tackle:
A) Decrease load weight B) Faster lifting
C) Increase effort needed D) Multiply force applied
Solution: D
Explanation: More pulleys = greater mechanical advantage.

5. Best machine for splitting wood:
A) Screw B) Wedge C) Pulley D) Wheel & axle
Solution: B
Explanation: Wedges split wood by force.

More Than One Answer Type

6. Applications of screws:
A) Wood screws B) Corkscrew C) Bicycle tire D) Machine screws
Solution: A, B, D
Explanation:: Tires are wheel & axle, not screws.

7. Which are wedges?
A) Axe B) Wheelbarrow C) Knife D) Chisel
Solution: A, C, D
Explanation: Wedges push apart materials.

Fill in the Blanks

8. The _____ consists of a large wheel & small axle for movement.
Solution: wheel and axle
Explanation: It reduces friction for easier movement.

9. A _____ is a cylindrical shaft with a spiral groove.
Solution: screw
Solution: Screws hold or lift by rotating.

Matching

10. Match machines with benefits:

10. Match each simple machine with its corresponding benefit.

Column A	Column B
1. Screw	A. Reduced friction, ease of movement
2. Wedge	B. Holding power, adjustability
3. Wheel and Axle	C. Efficiency in cutting or splitting
4. Pulley	D. Mechanical advantage in lifting

Solution: 1-B, 2-C, 3-A, 4-D
Explanation: Each machine offers a specific functional advantage.

Answer the Following

11. How do screws & wedges use inclined planes?
Solution: By using sloped surfaces to multiply force
Explanation: Screws use spiral slopes; wedges use angled slopes to cut.

12. How do wheels and axles help transportation?
Solution: They reduce friction and force needed to move loads
Explanation: Rolling takes less energy than dragging.