

Poorna Foundation



6th Grade Science Summer Packet

Poorna Foundation

Introduction:

This 6th-grade science Summer Packet is a review for entering 6th-grade science students and is designed to serve as a comprehensive tool to reinforce and strengthen understanding of key science concepts during the break. It offers a structured approach to reviewing and practicing essential skills, helping students maintain and build upon what they've learned.

Crafted specifically for summer learning, this packet helps students retain core science knowledge while preparing them for future success.

Unit 1: Matter (40 Questions)

Multiple Choice

- Which state of matter has a definite shape and volume?
A) Liquid B) Solid C) Gas D) Plasma
- What do the particles in a gas do?
A) Stay in fixed positions B) Vibrate only C) Move freely and quickly D) Stick together
- Which state of matter has the least kinetic energy?
A) Solid B) Liquid C) Gas D) Plasma
- What is a homogeneous mixture?
A) A mix with visible parts B) A pure substance C) A mix that looks uniform D) An element
- What happens to the volume of a gas when compressed?
A) It increases B) It stays the same C) It evaporates D) It decreases
- Which tool is used to measure density?
A) Thermometer B) Balance and graduated cylinder C) Balance and ruler D) Barometer
- Which element is likely a metal?
A) Oxygen B) Sulfur C) Copper D) Neon
- What is the physical property that allows metals to conduct electricity?
A) Density B) Malleability C) Luster D) Conductivity
- Which of the following is a physical property?
A) Flammability B) Color C) Reactivity D) Corrosion
- Which type of matter is uniform in composition but made of more than one substance?
A) Element B) Heterogeneous mixture C) Homogeneous mixture D) Compound
- What is the unit for measuring density?
A) Grams B) Liters C) Grams per cubic centimeter (g/cm^3) D) Kilograms per meter
- Which physical state changes shape but keeps its volume?
A) Liquid B) Solid C) Gas D) Plasma

True or False

- A pure substance can be separated by physical means. (T/F)
- Nonmetals are generally brittle and dull. (T/F)
- Solids have the most kinetic energy. (T/F)
- Density affects how substances interact in a fluid. (T/F)
- Gases have definite volume and shape. (T/F)
- All elements are pure substances. (T/F)
- Rare earth elements are easy to find in nature. (T/F)
- Solids always have higher density than liquids. (T/F)
- Mixtures can be made of solids, liquids, and gases. (T/F)
- A liquid has a definite shape. (T/F)

Free Response

23. Describe the differences between solids, liquids, and gases in terms of shape and volume.
24. How does kinetic energy differ in gases compared to solids?
25. Explain how to measure the density of a liquid.
26. Give two examples of heterogeneous mixtures.
27. Describe the process of identifying a substance using physical properties.
28. What are three physical properties of metals?
29. Why are metalloids considered “in-between” metals and nonmetals?
30. Explain why water and oil separate when mixed.
31. How does the density of an object determine whether it floats or sinks?
32. What makes an element 'rare' in the context of rare earth elements?
33. What are some modern uses of rare earth elements?
34. Compare pure substances and mixtures with examples.
35. Describe how to classify an unknown element using its physical properties.

36. What does it mean if a liquid layers over another liquid in a beaker?

37. List two elements from the periodic table and identify if they are metals, nonmetals, or metalloids.

38. How would you test a substance's conductivity in a classroom lab?

39. Why are homogeneous mixtures sometimes difficult to distinguish from pure substances?

40. Explain the importance of identifying physical properties in recycling or sorting materials.

Unit 2: Forces (40 Questions)

Types of Forces & Motion

Multiple Choice (12 questions)

41. What force causes objects to fall to Earth?
A) Gravity B) Friction C) Magnetism D) Push
42. What type of force slows down a sliding object?
A) Normal B) Gravitational C) Magnetic D) Friction
43. What happens when forces are balanced?
A) The object speeds up
B) The object changes direction
C) The object doesn't change motion
D) The object stops moving
44. What tool would you use to measure force?
A) Thermometer B) Spring scale C) Beaker D) Balance
45. Which is an example of applied force?
A) Earth's gravity
B) A magnet attracting metal
C) A person pushing a chair
D) Wind blowing leaves
46. Which force opposes motion between two surfaces?
A) Gravity B) Friction C) Magnetism D) Normal
47. A normal force acts:
A) Downward
B) Sideways
C) Opposite to gravity
D) Inside the object
48. Which is a contact force?
A) Friction
B) Gravity
C) Magnetic
D) Electric

49. Which force is non-contact?
A) Friction
B) Normal
C) Magnetic
D) Applied
50. Which object has the most friction?
A) Ice B) Sandpaper C) Glass D) Tile
51. An object with balanced forces will:
A) Stay in place or move at constant speed
B) Always speed up
C) Fall down
D) Reverse direction
52. A net force of 0 N means:
A) Forces are unbalanced
B) The object will move
C) Forces are balanced
D) There is no friction

True or False (10 questions)

53. Gravity only works on Earth. (T/F)
54. A force can change the shape of an object. (T/F)
55. Friction can be helpful or harmful. (T/F)
56. Magnetic forces can attract and repel. (T/F)
57. A moving object always has a net force. (T/F)
58. All contact forces require two objects touching. (T/F)
59. The stronger the friction, the harder it is to move something. (T/F)
60. The normal force always acts downward. (T/F)
61. Forces can only be measured in newtons. (T/F)
62. Balanced forces cause acceleration. (T/F)

Free Response (18 questions)

63. Define gravity and give one example.
64. How does friction help when walking?
65. Explain what a force diagram is.

66. Describe what happens when two people push in opposite directions with equal force.

67. Give an example of each: gravity, friction, magnetism, and applied force.

68. What is net force?

69. How can you tell if forces on an object are balanced or unbalanced?

70. Describe how a magnet behaves near a piece of iron.

71. How does the surface type affect friction?

72. Why is it harder to push something across carpet than tile?

73. Describe a scenario where more than one force acts on an object.

74. Explain what happens when an object is in free fall.

75. What is the role of a normal force on a book sitting on a desk?

76. How would you show forces acting on a box in a diagram?

77. What happens to motion when unbalanced forces act on an object?

78. Define applied force in your own words.

79. If a car is moving forward and friction acts backward, what is the net effect?

80. How does mass affect the force needed to move an object?

Unit 3: Energy (40 Questions)

Kinetic, Potential Energy & Conservation

Multiple Choice (12 questions)

81. What type of energy is stored due to height?
A) Chemical B) Elastic C) Gravitational potential D) Kinetic
82. A moving car has:
A) Potential energy
B) Kinetic energy
C) Chemical energy
D) Light energy
83. Which energy is stored in food and batteries?
A) Elastic B) Gravitational C) Thermal D) Chemical
84. What happens to kinetic energy when speed increases?
A) It decreases
B) It stays the same
C) It increases
D) It disappears
85. A roller coaster at the top of a hill has:
A) Kinetic energy
B) Gravitational potential energy
C) Chemical energy
D) Electrical energy
86. Energy stored in a stretched rubber band is:
A) Elastic potential energy
B) Kinetic energy
C) Thermal energy
D) Light energy
87. Which best shows energy transformation?
A) Water freezing
B) Light bulb glowing
C) Mixing sugar
D) Boiling water

88. Where does energy in a food web come from?
A) Animals B) Soil C) Sun D) Water
89. Photosynthesis turns light into:
A) Thermal energy B) Chemical energy C) Sound energy D) Kinetic energy
90. What is the Law of Conservation of Energy?
A) Energy disappears
B) Energy transforms but isn't lost
C) Energy increases
D) Energy stays still
91. When you rub your hands together, what energy is produced?
A) Light B) Chemical C) Heat D) Sound
92. In a closed system, energy:
A) Is destroyed
B) Increases
C) Is lost
D) Is conserved

True or False (10 questions)

93. Energy cannot be created or destroyed. (T/F)
94. Chemical energy is found in food. (T/F)
95. Light energy can be transformed into chemical energy by plants. (T/F)
96. Kinetic energy increases with speed. (T/F)
97. A compressed spring has no energy. (T/F)
98. All energy transformations produce sound. (T/F)
99. The sun is the source of energy in most ecosystems. (T/F)
100. A roller coaster uses both kinetic and potential energy. (T/F)
101. Thermal energy is always a waste product. (T/F)
102. A battery stores kinetic energy. (T/F)

Free Response (18 questions)

103. Describe the difference between kinetic and potential energy.

104. Give an example of chemical energy being used.

105. Explain how a roller coaster changes energy types.

106. What is energy transformation?

107. Describe the flow of energy in a food chain.

108. Explain why a moving ball has kinetic energy.

109. Give an example of energy conservation in a household.

110. How do solar panels work to transform energy?

111. What is elastic potential energy?

112. Describe how energy changes in a bouncing ball.

113. What are three forms of potential energy?
114. Why does a higher object have more gravitational potential energy?
115. Explain what happens to energy in a flashlight.
116. How does a wind turbine demonstrate energy transformation?
117. What is photosynthesis and what type of energy is involved?
118. Describe an example of energy being transferred and transformed.
119. How do you know energy is conserved when riding a bike?
120. What does the Law of Conservation of Energy tell us about energy in systems?