

FREE PRACTICE PACK · EDITION 1

Class 9 Science Olympiad practice

16 original questions + explained answers

For students preparing for SOF ISO.

Inside this pack

Eight topic-practice questions and an eight-question, 25-minute mini-mock.

Topics selected for practice

- Motion, force and energy
- Matter and atoms
- Sound
- Cells and tissues

How to use it

Try the practice first. Complete the mini-mock in one sitting. Check the explanations, mark mistakes, and retry them the next day.

This pack covers selected topics. It is original BodhiScore material, independent of SOF, and is not an official paper or a full-length exam. Check the official syllabus for the complete scope.

Topic practice

Work through these eight questions without a timer. Explain your choice before checking the solutions.

1. Motion, force and energy

A car accelerates from 10 m/s to 22 m/s in 4 s. What is its acceleration?

- | | |
|-------------------------------|------------------------------|
| A. 12 m/s ² | B. 2 m/s ² |
| C. 3 m/s ² | D. 8 m/s ² |
-

2. Matter and atoms

An atom has 11 protons and 10 electrons. What is its net charge?

- | | |
|--------------|---------------|
| A. +1 | B. +11 |
| C. -1 | D. 0 |
-

3. Sound

A sound wave has frequency 250 Hz and wavelength 1.2 m. What is its speed?

- | | |
|-------------------|-------------------|
| A. 500 m/s | B. 208 m/s |
| C. 300 m/s | D. 360 m/s |
-

Topic practice (continued)

4. Cells and tissues

Which cell structure releases energy from food during respiration?

- | | |
|---------------------|-------------------------|
| A. Vacuole | B. Mitochondrion |
| C. Cell wall | D. Chloroplast |
-

5. Motion, force and energy

A 2 kg object is lifted 5 m. Using $g = 10 \text{ m/s}^2$, how much gravitational potential energy is gained?

- | | |
|-----------------|-----------------|
| A. 250 J | B. 10 J |
| C. 50 J | D. 100 J |
-

6. Matter and atoms

An element has atomic number 17. How many protons are in its nucleus?

- | | |
|--------------|--------------|
| A. 7 | B. 17 |
| C. 18 | D. 34 |
-

Topic practice (continued)

7. Sound

Why can sound not travel through empty space?

- | | |
|---|--|
| A. It needs particles to transmit vibrations | B. Its frequency is always zero |
| C. Space absorbs all light | D. Sound is a liquid |
-

8. Cells and tissues

A plant tissue transports sugars from leaves to other parts. Which tissue does this?

- | | |
|-----------------|---------------------|
| A. Xylem | B. Epidermis |
| C. Cork | D. Phloem |
-

Timed mini-mock

Set a 25-minute timer for these eight questions. Score 1 point per correct answer; there is no penalty for an incorrect answer. This is BodhiScore's practice scoring.

9. Motion, force and energy

A force of 20 N moves a box 3 m in the force's direction. How much work is done?

- | | |
|----------------|-----------------|
| A. 17 J | B. 23 J |
| C. 60 J | D. 600 J |
-

10. Matter and atoms

Which particle determines the identity of an element?

- | | |
|-------------------------------|-----------------------------------|
| A. Number of molecules | B. Number of shells only |
| C. Number of protons | D. Number of neutrons only |
-

11. Sound

An echo returns 0.8 s after a shout. If sound speed is 340 m/s, how far away is the reflecting wall?

- | | |
|-----------------|-----------------|
| A. 272 m | B. 340 m |
| C. 68 m | D. 136 m |
-

Timed mini-mock (continued)

12. Cells and tissues

Why do red blood cells have a biconcave shape?

- A. It allows them to photosynthesise
 - B. It provides a large surface area for gas exchange
 - C. It makes them produce antibodies
 - D. It stores starch
-

13. Motion, force and energy

A 5 kg cart is pushed with 30 N while friction is 5 N. What is its acceleration?

- | | |
|----------------------|----------------------|
| A. 5 m/s^2 | B. 6 m/s^2 |
| C. 7 m/s^2 | D. 3 m/s^2 |
-

14. Matter and atoms

An ion has 12 protons and 10 electrons. What is its charge?

- | | |
|-------|-------|
| A. -2 | B. -1 |
| C. +1 | D. +2 |
-

Timed mini-mock (continued)

15. Sound

A tuning fork vibrates 512 times in one second. What is its frequency?

- A. 512 Hz
 - B. 1,024 Hz
 - C. 0.512 Hz
 - D. 256 Hz
-

16. Cells and tissues

A cell placed in very salty water loses water and shrinks. Which process explains water movement?

- A. Conduction
 - B. Osmosis
 - C. Photosynthesis
 - D. Combustion
-

Answers and explanations

Check why the answer works, then retry any question you missed.

1. C - 3 m/s^2

Acceleration = $(22 - 10)/4 = 3 \text{ m/s}^2$.

2. A - +1

One more proton than electron gives a net charge of +1.

3. C - 300 m/s

Wave speed = frequency x wavelength = $250 \times 1.2 = 300 \text{ m/s}$.

4. B - Mitochondrion

Mitochondria are the main sites of cellular respiration.

5. D - 100 J

Gain = $mgh = 2 \times 10 \times 5 = 100 \text{ J}$.

6. B - 17

The atomic number equals the number of protons.

7. A - It needs particles to transmit vibrations

Sound is a mechanical wave and needs a material medium.

8. D - Phloem

Phloem transports dissolved sugars around a plant.

9. C - 60 J

Work = force x distance = $20 \times 3 = 60 \text{ J}$.

Answers and explanations (continued)

10. C - Number of protons

The proton count, or atomic number, defines the element.

11. D - 136 m

The sound travels to the wall and back: distance = $340 \times 0.8 / 2 = 136$ m.

12. B - It provides a large surface area for gas exchange

The biconcave shape increases surface area and supports oxygen exchange.

13. A - 5 m/s^2

Net force is 25 N; acceleration = $25/5 = 5 \text{ m/s}^2$.

14. D - +2

There are two more protons than electrons, so charge is +2.

15. A - 512 Hz

Frequency is the number of vibrations per second, here 512 Hz.

16. B - Osmosis

Water moves across a selectively permeable membrane by osmosis.

Topic scope checked against SOF syllabus: [SOF ISO Class 9 syllabus](#)