Mindathon

MSO OLYMPIAD

WORKBOOK

MINDATHON SCIENCE OLYMPIAD

4

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PREFACE

Welcome to the Mindathon Science Olympiad! We recognize the pivotal role of cognitive development in early education. Our curriculum aligns with the National Curriculum Framework's vision, emphasising holistic growth of a child through critical thinking, hands on experience and development of skills. We strive to empower learners to engage meaningfully in their learning journey.

This book has been carefully designed to provide learners with a stimulating and enriching experience in the scientific concepts. Science Olympiads are an excellent platform for students to showcase their scientific attitude, innovative thinking and creativity.

Students will find a diverse range of exercises and challenges tailored to enhance their understanding in Science. The content has been crafted to align with the curriculum standards while also incorporating elements that promote higher-order thinking and problem-solving skills.

Our primary goal is to make learning Science enjoyable and rewarding for students. Each chapter is structured to facilitate a progressive learning journey, starting with foundational concepts and gradually advancing to more complex topics.

Challenging multiple-choice questions and engaging exercises will provide students with the chance to strengthen a variety of skills, such as experimentation, enhancement of application, drawing inference, critical thinking, analysis and correlation with daily life experience.

Multiple Choice Questions (MCQs) in this book vary in difficulty from easy to moderate and difficult levels, providing a range of challenges for students to test their scientific aptitude effectively.

Additionally, this book aims to instill a love for Science learning and encourage students to become confident in this subject. We believe that participation in the Science Olympiad not only fosters academic excellence but also cultivates important life skills such as creativity and perseverance.

We hope that students will find this book both challenging and enjoyable as they embark on their journey to Science proficiency. May it inspire them to strive for excellence and unlock their full potential in the fascinating world of the Science.

We wish all participants the very best in their Science Olympiad endeavours!

Edition : New Edition

CLASS-4
OLYMPIAD PRACTICE QUESTIONS

CONTENT **Page No.**

NOTES

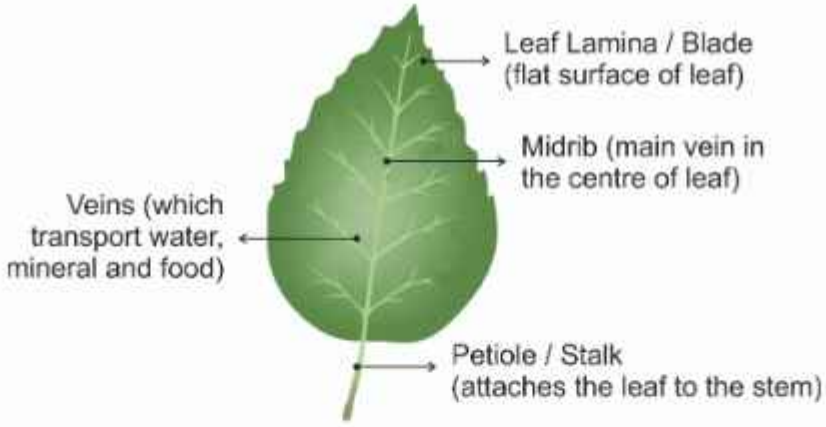
Lesson-1

The Plant World

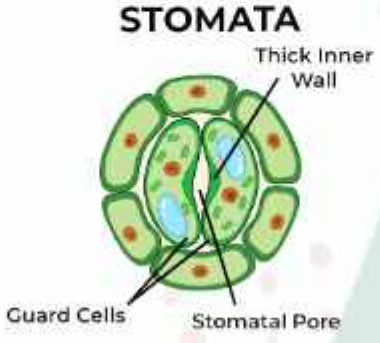
Mind Map

- **Leaf :** The kitchen of plant
  - Shapes of different leaves

- Why leaves are green due to presence of green pigment chlorophyll?



- Stomata are tiny openings on under surface of leaf. They help the plant to breathe. They also help in transpiration.



Plant parts and their functions

Leaf
- Performs photosynthesis
- Performs transpiration
- Store food (cabbage, lettuce, coriander)
- Performs respiration

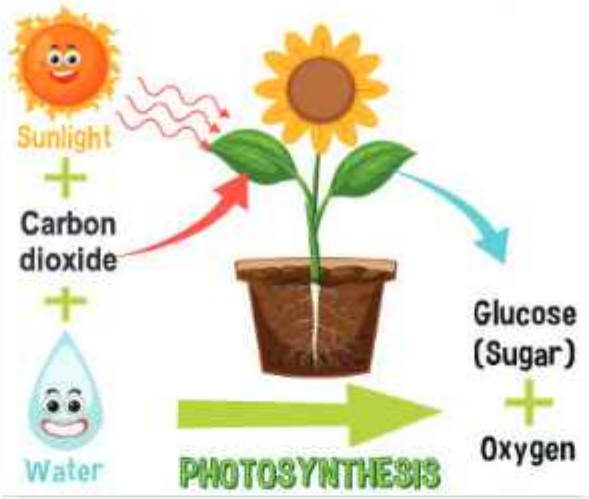
Root
- Holds the plant in soil
- Absorbs water and minerals from soil
- Stores food *e.g.* Carrot, Radish

Stem
- Anchors the plant
- Transport food, water, minerals to different plant parts
- Stores food *e.g.* Sugarcane, Potato

Flower
- Helps in plant reproduction
- Produces fruit and seed
- Stores food *e.g.* Broccoli, Cauliflower

Photosynthesis:-

Carbondioxide (from air) + Water (from soil) $\xrightarrow{\text{Sunlight (chlorophyll)}}$ Oxygen (into air) + Food (stored as starch)



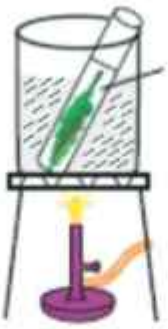
SOLVED EXAMPLE

Hands on with a leaf

- Take a potted plant and pluck it's leaf. Wash the leaf.
- Boil the leaf in water for 10 minutes.
- Put this leaf in alcohol and boil again, till the leaf gets decolourised. This shows the chlorophyll pigment is removed from the leaf now.
- Wash the leaf and put it on a petridish.
- Add 2-3 drops of iodine solution on the leaf.

- The colour of leaf changes to blue black. This shows the presence of starch in the leaf.

Boiling the leaf in water



Boiling the leaf in alcohol

Adding iodine solution

GENERAL SCIENCE, SCIENTIFIC AWARNESS AND EVERYDAY SCIENCE

Single correct answer

1. **The process of photosynthesis does not require**

a) water
b) chlorophyll
c) sunlight
d) oxygen

1.	A	B	C	D

2. **Which of the following will give blue black colour with iodine?**

a) potato juice
b) lemon juice
c) orange juice
d) milk

2.	A	B	C	D

3. **In the food chains working in nature, which of these are at the producer level?**

a) plant eating animals
b) green plants
c) dead animals
d) decomposers

3.	A	B	C	D

4. **The stomatal pores at the undersurface of the leaf, are responsible for**

a) releasing water for transpiration
b) exchanging oxygen and carbon dioxide with the surroundings
c) both a) and b)
d) releasing chlorophyll in air

4.	A	B	C	D

5. **In which of these processes do plant take in carbon dioxide and convert it into oxygen?**

a) respiration
b) photosynthesis
c) transpiration
d) translocation

5.	A	B	C	D

6. **The veins that we see on the leaf back are actually**

a) a grid of stomatal pores
b) channels to move materials
c) network of chlorophyll pockets
d) none of these

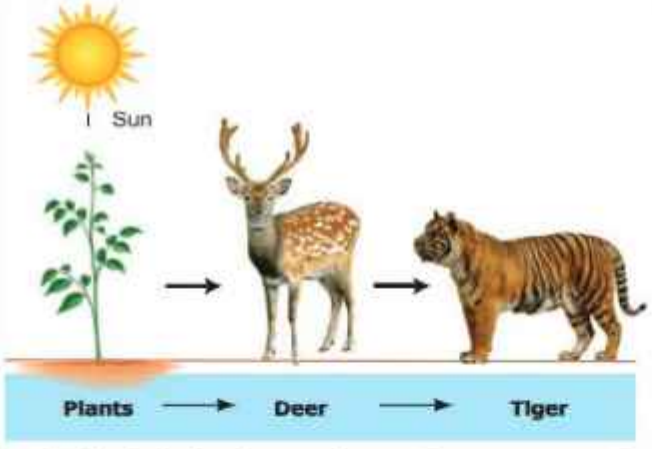
6.	A	B	C	D

7. **The tissues in stem which form a channel for transportation of food prepared by leaves to different plant parts are called**

a) phloem
b) xylem
c) vascular bundles
d) meristem

7.	A	B	C	D

8.



In the food chain shown above, the consumers level include

a) plant
b) deer
c) lion
d) both b) and c)

8.	A	B	C	D

9. **When a leaf is boiled in alcohol, then which of these get separated from it?**

a) water
b) starch
c) chlorophyll
d) dust and dirt

9.	A	B	C	D

10. **Which of the following potted and well watered plants will be able to perform photosynthesis?**

a) green plant kept in dark room

b) plant with variegated leaves (e.g. Croton) kept in dark

c) dead plant kept in sunlight

d) green plant kept in sunlight

10. (A) (B) (C) (D)

11. **When a green plant is kept in dark for a few days then it gets**

a) tanned

b) destarched

c) variegated

d) destroyed

11. (A) (B) (C) (D)

12. **Leaves of many plants are edible. We cannot eat the leaves of which of the following plants?**

a) banana

b) coriander

c) spinach

d) mustard

12. (A) (B) (C) (D)

13. **Sunlight needed for photosynthesis in a plant is trapped by**

a) red pigment carotene

b) yellow pigment chlorophyll

c) white pigment carotene

d) green pigment chlorophyll

13. (A) (B) (C) (D)

14. **Leaves of plant prepare food for it. In which plant, is this function performed by the stem?**

a) sugarcane

b) turmeric

c) cactus

d) pine

14. (A) (B) (C) (D)

15. **Which of the following statements are true about the balance in nature?**

a) If we cut more plants, animals will not get food or oxygen.

b) If more animals are born. There will not be enough food.

c) Plants and animals depend on each other.

d) All of these are true.

15. (A) (B) (C) (D)

16. **The reaction which correctly shows the process of respiration in plants is**

a) carbon dioxide + glucose $\longrightarrow$ oxygen + energy + water

b) oxygen + glucose + water $\longrightarrow$ carbon dioxide + energy + water

c) oxygen + energy $\longrightarrow$ carbon dioxide + glucose + water

d) carbon dioxide + energy $\longrightarrow$ oxygen + glucose + water

16. (A) (B) (C) (D)

17. **Which of these plants would grow in areas of heavy rainfall?**

a) Keekar b) Babool c) Rubber d) Cactus

17. (A) (B) (C) (D)

18. **The climate needed for growth of tea and coffee is**

a) hot and wet b) hot and dry

c) cold and wet d) cold and dry

18. (A) (B) (C) (D)

19. **We celebrate World Environment Day every year on**

a) 5th September b) 5th April c) 5th June d) 5th August

19. (A) (B) (C) (D)

20. **The process shown below, in a plant, does not take place**

a) from 6:00 a.m. to 6:00 p.m. b) from 6:00 p.m. to 6:00 a.m.

c) from 12:00 noon to midnight d) from midnight to 12:00 noon

20. (A) (B) (C) (D)

TWO OR MORE CORRECT ANSWERS

21. **If A : gram, pea,**

B : cucumber, tomato,

C : potato, turmeric,

D : cabbage, spinach,

then to which category would you place coriander?

a) A b) B c) C d) D

21. (A) (B) (C) (D)

22. **Tisha covered one leaf of a potted plant with black paper and placed the plant in sunlight for 2-3 days. She then removed the paper and performed iodine test on it. She observed that the leaf did not turn blue black. This means**

a) leaf could not perform photosynthesis.

b) leaf was destarched.

c) leaf had excess of starch.

d) leaf could photosynthesise, but not respire.

22. (A) (B) (C) (D)

23. **The veins in our body carry blood. Similarly, the veins on a leaf blade carry**

a) water (b) chlorophyll

c) food (d) carbon dioxide

23. (A) (B) (C) (D)

24. **Which of the following are autotrophic?**

a) Button mushroom b) Basil plant

c) Croton plant d) Silver fish

24. (A) (B) (C) (D)

25. **I am an important part of shoot system as I support the plant. What else do I do in the plant?**

a) absorb water and minerals from soil

b) perform respiration in plant

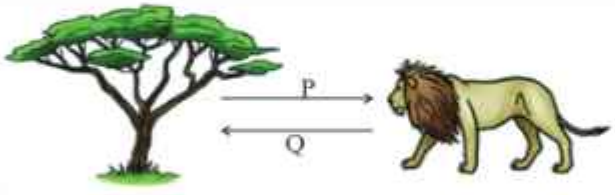
c) carry water and minerals from roots

d) carry food to different parts of the plant

25. (A) (B) (C) (D)

MINDATHON LITTLE SCIENTISTS

26.



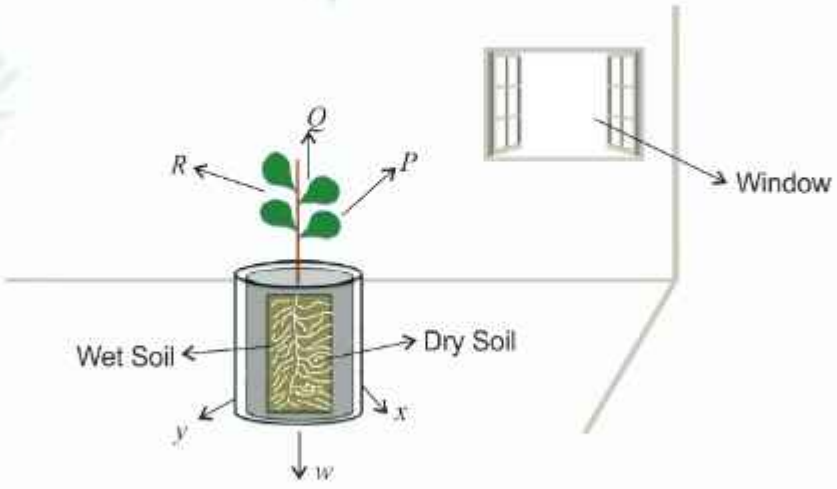
In the above picture P and Q represent respectively

a) Food and Oxygen b) Oxygen and Carbon dioxide

c) Carbon dioxide and Oxygen d) Food and Carbon dioxide

26. (A) (B) (C) (D)

27. **A plant was kept in a dark room in which one window was open from where sunlight could enter, as shown below. In which direction would the stem and the root grow?**



a) stem towards *P*, root towards *y*
b) stem towards *Q*, root towards *w*
c) stem towards *R*, root towards *x*
d) stem towards *Q*, root towards y

27. (A) (B) (C) (D)

28. **The leaf shown above reproduces for the plant. This leaf is of**

a) fern
b) moss
c) bryophyllum
d) lotus

28. (A) (B) (C) (D)

29. **Stomatal pores absorb and give out different things. Which of the following do they only give out to the surroundings?**

a) oxygen
b) carbon dioxide
c) chlorophyll
d) water vapours

29. (A) (B) (C) (D)

30. **Dead plants and animals are useful for plants because**

a) they are decomposed to release minerals in soil
b) they are decomposed to absorb germs from soil
c) they help the roots of plants grow deeper in soil
d) they trap moisture and useful gases from air

30. (A) (B) (C) (D)

ASSERTION / REASONING TYPE

31. **A : Croton leaves appear red. It cannot perform photosynthesis.**
B : Croton has chlorophyll, but appears red due to other pigments.

a) both A and B are correct
b) both A and B are incorrect
c) only A is correct
d) only B is correct

31. (A) (B) (C) (D)

32. **A : Washing a leaf in alcohol removes chlorophyll.**
B : A destarched leaf cannot do photosynthesis.

a) both A and B are correct
b) both A and B are incorrect
c) only A is correct
d) only B is correct

32. (A) (B) (C) (D)

CASE BASED QUESTIONS

There are many processes in plants which keep on occurring all the time, whether sun is present or not. Once the sun sets, some processes stop, while others keep on occurring.

33. **The process which cannot occur in the absence of sunlight in plants is**

a) transpiration
b) respiration
c) translocation
d) photosynthesis

33. (A) (B) (C) (D)

34. **Sometimes leaves of plants shrink in extreme sunlight. This happens to prevent the loss of**

a) water
b) starch
c) chlorophyll
d) oxygen

34. (A) (B) (C) (D)

35. **The process of transfer of food from leaves to plant parts is called**

a) transpiration
b) translocation
c) transdecendence
d) transparency

35. (A) (B) (C) (D)