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Fully Revised

Shikha Gupta  
Shikha Nautiyal

# SCIENCE OLYMPIAD

National Science Olympiad

# 3

Strictly according  
to the latest  
syllabus of Science  
Olympiad

Animals

Food

Water

Matter and  
Minerals

Light, Force  
and Sound

Figure  
Matrix

Series

Coding and  
Decoding

The  
Gen X  
Series

A SUCCESS PACKAGE FOR ASPIRANTS OF SCIENCE OLYMPIAD

# NATIONAL SCIENCE OLYMPIAD

Exploring the World of Science

**Class 3**

**Author**  
**Shikha Gupta**  
**Shikha Nautiyal**



**V&S PUBLISHERS**

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## Publisher's Note

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V&S Publishers, after the grand success of a number of Academic and General books, is pleased to bring out a series of *Science Olympiad* books under *The Gen X series – generating Xcellence in generation X* – which has been designed to focus the problems faced by students. In all books the concepts have been explained clearly through various examples, illustrations and diagrams wherever required. Each book has been developed to meet specific needs of students who aspire to get distinctions in the field of science and want to become Olympiad champs at national level.

To go through the exams successfully, the students need to do thorough study of topics covered in the *Olympiad syllabus and the topics covered in the school syllabus as well*. The Olympiads not only tests subjective knowledge but Reasoning skills of the students also. So students are required to comprehend the depth of concepts. The Olympiads check efficiency of candidates in problem solving. These exams are conducted in different stages at regional, national, and international levels. At each stage of the exam, the candidate should be fully prepared to go through the exam. Therefore, this test requires careful attention towards comprehension of concepts, thorough practice, and application of rules.

While other books in market focus selectively on questions or theory; V&S Science Olympiad books are rather comprehensive. Each book has been divided into five sections namely *Science, Logical Reasoning, Achievers section, Subjective section, and Model Papers*. The theory has been explained through solved examples. To enhance problem solving skills of candidates, *Multiple Choice Questions (MCQs)* with detailed solutions are given at the end of each chapter. Two *Mock Test Papers* have been included to understand the pattern of exam. A CD containing Study Chart for systematic preparation, Tips & Tricks to crack Science Olympiad, Pattern of exam, and links of Previous Years Papers is accompanied with this book. The books are also useful for various other competitive exams such as NTSE, NSTSE, and SLSTSE as well.

We wish you all success in the Olympiad and a very bright future in the field of science.

All the best



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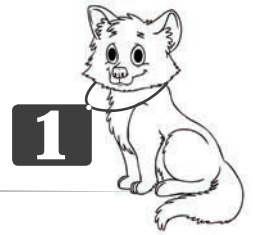


# **Section 1 : Science**





# Plants and Animals



## Learning milestones:

- learn about plants
- know different parts of a plant
- learn about animals
- understand different types of animals
- comprehend the food chain
- find out how animals eat

## Plants

Plants are living organisms and share common characteristics with all other living things. All organisms are composed of cells. They grow, reproduce, and respond to various kinds of stimuli like light and temperature.

Plants have different parts just like we do. We have arms, legs, heart, lungs, etc., to help us survive. Each of our body parts has a certain job to do. Similarly, plants have different parts, each with its own job to do. They must have roots, stems and leaves. Each part of the plant must do its job so the plant can stay healthy and grow.

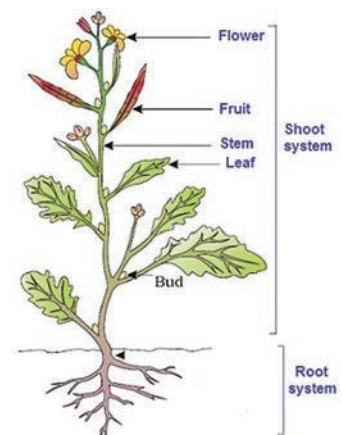
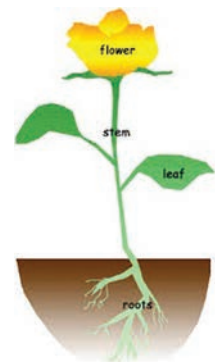
A plant body is divided into two parts.

**Shoot:** It is the part of a plant above the ground. The stem, branches, leaves, buds, flowers and fruits together make up the **shoot**.

**Root:** The part of a plant which is under the ground is called the **root**.

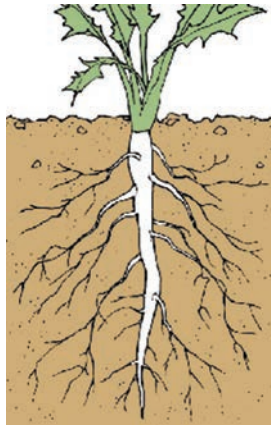
## Roots

Root is an important part of a plant. Roots can have different shapes and sizes. Roots are of two main types: tap root and fibrous roots.



## Tap Roots

Some plants may have just one main root with many smaller branch roots. This main root is called tap root. Plants like mango, neem, beans and radish have tap roots.



tap root

## Fibrous Root

Some plants have many roots growing from the end of the stem. These roots are called fibrous roots. Plants like grass, wheat, rice and maize have fibrous roots.



fibrous roots

## Functions of Roots

1. Roots hold the plant firmly in the soil.
2. Roots absorb water and mineral salt from the soil.
3. Some roots, like radish and carrot, are edible because they have food stored in them.

## Shoot

The part of the plant which is above the ground is called shoot system. It consists of stem, branches, leaves, flowers and fruits.

## Stem

The stem is part of a plant that holds up other structure of the plant, such as the leaves and flowers. There are mainly six types of stems:

1. Green, upright stems (example: sunflower)



2. Tall, woody, upright stems (example: mango tree)



3. Short, woody, upright stems (example: rose plant)



4. Stems that store food (example: onion)



5. Weak, green stems that can be upright only with support (example: money plant)



6. Weak, green stems that grow along the ground (example: watermelon)



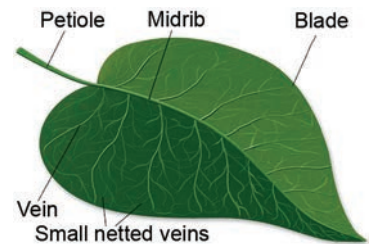
### Functions of Stem

1. It connects all parts of the plant.
2. It keeps the plant upright and straight.
3. It transports water and nutrients from the roots to different parts of plant.
4. It carries food made by the leaves to other parts of the plant.
5. Some stems like sugarcane, potato and ginger store food in them. Such stems are called tubers.

### Leaves

A leaf has many parts. It has a flat structure called leaf blade or lamina. It has lots of veins running across. The stalk of the leaf is called a petiole.

We see leaves of many sizes, shapes and colours around us. Most of the leaves are green in colour. But we have red, yellow, purple and brown leaves also. The green colour of the leaves is because of the green substance called **chlorophyll**.



leaves of different shapes and sizes

## Functions of Leaves

1. Green leaves prepare food for the plant in presence of air, water and sunlight. This process is called **photosynthesis**.
2. Leaves give out a gas called oxygen. This gas is used by living things to breathe. Leaves also absorb carbon dioxide and sunlight to produce carbohydrates, while minimizing water loss.
3. Leaves of some plants like spinach, cabbage and lettuce are edible as they store food.

## Flowers, Fruits and Seeds

Flowers grow from small buds on the stem. Flowers are of different colours, shapes and sizes. Some flowers change into fruits. Fruits have seeds in them. Seeds grow into new plants. Thus, the function of flowers is to help a plant grow more of its kind. Some flowers like cauliflower and broccoli are edible as they store food in them.



flowers of different shapes and sizes

Once the seed from the petals fall off, the lower part of the flower becomes big and changes into fruit. Fruits can have many seeds. Mango, grapes, apples are some of the most common fruits.



different types of fruits

Seeds are protected within fruits. The seeds vary in size, shape and colour. Seed have a baby plant inside them. Seeds need air, water and warmth to germinate. We also eat some seeds, such as wheat, gram, corn and rice.



different types of seeds

### What do plants do for us?

1. Plants are the primary source of food for us.
2. The roots of the plant hold soil particles and prevent wind or water from carrying away the soil.
3. Plant help to beautify our surroundings.
4. Plants can remove some of the harmful gases that pollute air. When we have more plants around us, we have cleaner air to breathe.

## Animals

### Herbivores

Many animals eat only plants. Such animals are called herbivores. Herbivores, such as cow, deer, giraffe and elephant eat grass, leaves, fruits and plants.



herbivores

## Carnivores

Have you seen an animal try to catch another? For example, a lizard eating insect. A lizard does not eat plants. It feeds on insects. Many animals eat other animals. They are called flesh-eating animals or carnivores. Tiger, wolf and crocodile are carnivores.



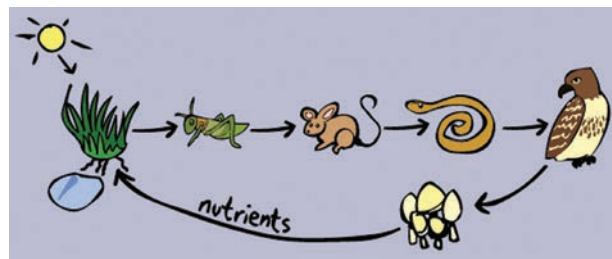
examples of carnivores and omnivores

Some animals like dog, bear, crow etc., eat both plants and animals. They are called omnivores. Man too is an omnivore.

## Food Chain

Plants make their own food. Some animals eat plants. These plant-eating animals or herbivores are eaten by flesh eating animals or carnivores. This process of one organism eating another organism is called a food chain. All food chains start from plants.

For example, on land, a herbivore is going to eat grass. This animal will be eaten by a larger meat-eating animal, such as an omnivore or a carnivore. Eventually a larger species will eat the smaller and the cycle of the food chain will continue. See the example given below:



## How Animals Eat

Different animals eat different types of food. Each animal has mouth parts that are suited to the kind of food it eats.

## Teeth

**Herbivores**, or grass eaters, have a combination of sharp teeth and flat back teeth. Sharp teeth help them to bite the grass and leaves. Their flat back teeth help them to chew the food. A cow is one example of a herbivore.



Cows and buffaloes swallow food without chewing it. Afterwards, they bring the food back from the stomach to the mouth to chew it properly. This is called **chewing the cud** or **masticating**.

**Carnivores**, or meat eaters, have very sharp teeth which help them to tear the food they will eat. However, like herbivores, their back teeth are flat and help to chew their food well. A lion is an example of a carnivore.

Some living things, such as snakes, have to eat differently than other carnivores. Snakes, lizards, and frogs do eat meat but they do not have teeth. Since snakes cannot chew their food they swallow their food in one whole piece and digest it slowly. Lizard and frogs catch insects with their long, sticky tongues.

A mosquito has a long and pointed tube in its mouth. It can suck blood of animals with this tube. A butterfly too has a long tube which it uses to suck nectar from the flower.

**Omnivores** eat both meat and plants. Humans are omnivores. Look at your teeth in the mirror. Feel the sharpness of each tooth by running your fingertip over your teeth. You will find that omnivores have both flat back teeth to help chew and sharp teeth to help tear up meat.



### Activity

Answer the following questions:

1. What travels through a food chain or web?
2. What is the ultimate energy for all life on earth?
3. What do all food chains start with?
4. The first organism in a food chain must always be a .....
5. Name two food-making processes.

---

## Multiple Choice Questions

---

- Plants get carbon dioxide from:**
  - Air
  - Leaves
  - Soil
  - Sand
- The main purpose of a plant's flower is to:**
  - Provide support
  - Provide water
  - Produce food
  - Produce seed
- Name the green colouring substance that is present in leaves?**
  - Salt
  - Carotene
  - Chlorophyll
  - All of the above
- This part of a root helps with absorption:**
  - Guard cells
  - Root hairs
  - Phloem
  - Stems
- Which type of vascular tissue is made of living cells and conducts sugars?**
  - Xylem
  - Fibrous roots
  - Phloem
  - Stomata
- Which of these is NOT needed for photosynthesis?**
  - Chlorophyll
  - Sunlight
  - Oxygen
  - Water
- This part of a plant soaks up water and minerals. It also stores food.**
  - Root
  - Leaves
  - Flowers
  - Stem
- Which gas do plants release into the air?**
  - Oxygen
  - Hydrogen
  - Carbon dioxide
  - Nitrogen
- The \_\_\_\_\_ hold the seeds.**
  - Roots
  - Leaves
  - Stems
  - Fruits
- Which statement is NOT true?**
  - A plant comes from a seed
  - Leaves are attached to the stem
  - Roots of a plant are usually above the soil
  - A plant is a living thing that grows

- 11. A plant needs \_\_\_\_\_ to survive.**  
A. Food, clothing, electricity  
B. Water, silver, oil, and a place to grow  
C. Air, shelter, gold  
D. Food, water, air, light and a place to grow
- 12. Plants that get energy from the food they make are called \_\_\_\_\_.**  
A. Herbivores  
B. Producers  
C. Omnivores  
D. Carnivores
- 13. Several seeds are planted on a hill. Which of the following growths will you see first?**  
A. A tree  
B. A bush  
C. A seedling  
D. Roots
- 14. \_\_\_\_\_ trees stay green all year round.**  
A. Pine  
B. Oak  
C. Maple  
D. Evergreen
- 15. \_\_\_\_\_ trees lose their leaves in the fall or autumn.**  
A. Deciduous  
B. Pine  
C. Evergreen  
D. Herbivore
- 16. A tiger is a \_\_\_\_\_.**  
A. Carnivore  
B. Herbivore  
C. Omnivore  
D. Dinosaur
- 17. Omnivores eat:**  
A. Seak  
B. Carrot sticks  
C. Plants and animals  
D. Animals
- 18. What is a food chain?**  
A. The relationship an animal has with everything around them  
B. A grocery store  
C. A group of bigger animals that eat smaller ones  
D. None of the above
- 19. Which of the following animals chews cud?**  
A. Ducks  
B. Monkeys  
C. Cows  
D. Snakes

20. How do snakes eat their food?

- A. With a knife and fork
- B. In tiny pieces
- C. By swallowing it whole
- D. Through a straw

21. Find the odd one among the following animals.

- A. Ant
- B. Frog
- C. Grasshopper
- D. Cockroach

22. Whose job is it to protect wild animals and their forest home?



goat

A



colobus monkey

B



building

C



mine

D

23. The main role of a producer is:

- A. To kill animals
- B. To eat other animals
- C. To get eaten by eagles
- D. To prepare food

24. Frogs depend on \_\_\_\_\_ for their food.

- A. Grass
- B. Snakes
- C. Other frogs
- D. Grasshopper

25. Which of the following sucks blood from other animals with the help of suckers?

- A. Butterflies
- B. Spiders
- C. Leech
- D. Mushroom

26. The long tongue of the butterflies is called:

- A. Sucker
- B. Gill
- C. Stomata
- D. Proboscis

27. Study the following chart:



The arrow means "is eaten by". Which of the following animals can X be?

- A. Frog
- B. Eagle
- C. Goat
- D. Snake

**28. Which of the following animals has no teeth to tear food?**

- A. Cat
- B. Dog
- C. Cow
- D. Lion

**29. This animal's body is used to make wool.**

- A. Sheep
- B. Leopard
- C. Goat
- D. Lion

**30. Which of the following spins webs to trap insects and eat them?**

- A. Butterflies
- B. Honey bees
- C. Fire flies
- D. Spiders

**Answer Key**

1. A   2. D   3. C   4. B   5. C   6. C   7. A   8. A   9. A  
10. C   11. D   12. B   13. B   14. A   15. A   16. A   17. C   18. A  
19. C   20. C   21. B   22. D   23. D   24. D   25. C   26. D   27. C  
28. C   29. A   30. D