Collegedunia NCERT Solutions

Step-by-step solutions for NCERT Curiosity, Reprint 2026-27

Chapter 9: Life Processes in Animals

These Life Processes in Animals class 7 science (curiosity) NCERT solutions explain digestion, breathing, respiration, and simple investigations.

Also see for this chapter:

Let Us Enhance Our Learning

Q 9.1 **Complete the journey of food through the alimentary canal by filling up the boxes with appropriate parts: Food → Mouth → _____ → Stomach → _____ → _____ → Anus.**

SOLUTION

Concept used. The alimentary canal is one continuous tube. Food passes through its parts in a fixed order.

Step 1. Food enters the mouth, where teeth chew it and saliva starts starch digestion.

Step 2. The oesophagus pushes swallowed food to the stomach by wave-like movement.

Step 3. The stomach churns food and mixes it with digestive juice.

Step 4. The small intestine completes digestion and absorbs most nutrients.

Step 5. The large intestine absorbs remaining water. Waste finally leaves through the anus.

☞ **Correct order**

The small intestine comes before the large intestine.

Final Answer: Food → Mouth → **Oesophagus** → Stomach → **Small intestine** → **Large intestine** → Anus.

EXPERT'S SOLUTION *: Aarav Sharma, M.Sc Zoology, University of Delhi*

Concept used. Trace one piece of food from entry to exit. Each organ follows the previous organ and has a particular task.

Step 1. The mouth breaks food and mixes it with saliva.

Step 2. The oesophagus carries softened food to the stomach.

Step 3. The stomach churns food and starts protein digestion.

Step 4. The small intestine completes digestion and absorbs nutrients.

Step 5. The large intestine removes water before waste exits through the anus.

The liver and pancreas help digestion, but food does not pass through them.

> **Final Answer:** The missing parts are **oesophagus, small intestine, and large intestine**.

Q 9.2 **Sahil placed some pieces of chapati in test tube A. Neha placed chewed chapati in test tube B, and Santushti took boiled and**

mashed potato in test tube C. All of them added a few drops of iodine solution to their test tubes A, B, and C, respectively. What would be their observations? Give reasons.

SOLUTION

Concept used. Iodine turns blue-black when starch is present. Chapati and potato contain starch. Saliva changes starch into simple sugar.

Step 1. Unchewed chapati in A contains starch, so it turns blue-black.

Step 2. Chewing mixes chapati in B with saliva. Saliva digests some starch.

Step 3. B may remain brown or show only faint blue-black colour, depending on chewing time.

Step 4. Boiled potato in C still contains starch, so it turns blue-black.

☞ **Iodine test**

Blue-black colour is evidence of starch, not sugar.

Final Answer: A and C turn blue-black. B shows no blue-black colour, or a much lighter one, because saliva digests starch.

EXPERT'S SOLUTION : *Diya Nair, Ph.D Biochemistry, IISc Bengaluru*

Concept used. Compare starch-positive samples with the saliva-treated sample. Iodine reveals how much starch remains.

Step 1. A has not mixed with saliva, so its starch remains.

Step 2. C also supplies starch, although boiling changed its texture.

Step 3. B has mixed with saliva for many seconds, converting some starch into sugar.

Step 4. Iodine gives strong blue-black colour in A and C but weak or no blue-black colour in B.

For a stronger follow-up experiment, equal quantities and equal iodine drops would make the comparison fair.

> **Final Answer:** Strong blue-black: **A and C**. Weak or absent blue-black: **B**.

Q 9.3 **What is the role of the diaphragm in breathing? (i) To filter the air (ii) To produce sound (iii) To help in inhalation and**

exhalation (iv) To absorb oxygen

SOLUTION

Concept used. The diaphragm is a dome-shaped muscular sheet below the lungs. Its movement changes chest space and moves air.

Step 1. During inhalation, the diaphragm contracts and moves down.

Step 2. Chest space increases, so air enters the lungs.

Step 3. During exhalation, it relaxes and curves upward.

Step 4. Chest space decreases, so air moves out.

♥ **Pressure change**

The diaphragm moves air by changing chest volume.

Final Answer: **(iii) To help in inhalation and exhalation**.

EXPERT'S SOLUTION : *Kabir Mehta, M.Sc Human Physiology, BHU*

Concept used. Air flows when chest volume changes. The diaphragm creates this change with the rib muscles.

Step 1. A contracted diaphragm becomes flatter and moves downward.

Step 2. The lungs get more room, so outside air enters.

Step 3. A relaxed diaphragm rises into its dome shape.

Step 4. The reduced space helps push air outside.

Nasal passages filter air, the voice box produces sound, and alveoli exchange gases.

Final Answer: Option **(iii)** is correct.

Q 9.4 **Match the following. Names: (i) Nostrils, (ii) Nasal passages, (iii) Windpipe, (iv) Alveoli, (v) Ribcage. Functions: (a) fresh air from outside enters, (b) exchange of gases occurs, (c) protects lungs, (d) tiny hair and mucus help to trap dust and dirt from the air we breathe, (e) air reaches our lungs**

through this part.

SOLUTION

Concept used. Match each respiratory part with its position and job. Follow air from entry to gas exchange.

Step 1. Nostrils are outside openings, so fresh air enters through them: (i)–(a).

Step 2. Nasal passages contain hairs and mucus that trap dirt: (ii)–(d).

Step 3. The windpipe carries air towards the lungs: (iii)–(e).

Step 4. Alveoli are tiny sacs where gases are exchanged: (iv)–(b).

Step 5. The bony ribcage surrounds and protects the lungs: (v)–(c).

☞ **Follow the air**

Tracing airflow makes the matches clear.

Final Answer: (i)–(a), (ii)–(d), (iii)–(e), (iv)–(b), (v)–(c).

EXPERT'S SOLUTION : *Meera Iyer, Ph.D*
Respiratory Biology, TIFR Mumbai

Concept used. Separate the parts into entry, cleaning, transport, exchange, and protection.

Step 1. Entry occurs at the nostrils.

Step 2. Cleaning occurs in nasal passages because hairs and mucus catch particles.

Step 3. Transport occurs through the windpipe.

Step 4. Exchange occurs across the thin walls of alveoli.

Step 5. Protection comes from the ribcage around the lungs.

The matches describe airflow from outside to the lungs, plus protection.

> **Final Answer:** **Nostrils–a; nasal passages–d; windpipe–e; alveoli–b; ribcage–c.**

Q 9.5 **Anil claims to his friend Sanvi that respiration and breathing are the same process. What question(s) can Sanvi ask him to make him understand that he is not**

correct?

SOLUTION

Concept used. Breathing moves air into and out of lungs. Respiration is a chemical process in cells that releases energy from food.

Step 1. Sanvi can ask, “Does breathing release energy from glucose inside every cell?” It does not.

Step 2. She can ask, “Does respiration mean only air movement through lungs?” It does not.

Step 3. She can ask where each process occurs. Breathing involves respiratory organs, while respiration occurs in cells.

Step 4. She can ask what each produces. Respiration releases energy and forms carbon dioxide and water.

> ☞ **Key difference**
>
> Breathing supplies oxygen. Respiration uses it to release energy.

> **Final Answer:** Questions about the place, nature, and products of both processes show that breathing and respiration differ.

EXPERT'S SOLUTION *: Rohan Gupta, M.Sc Life Sciences, JNU*

Concept used. Test a feature the processes cannot share. Their location and outcome provide the clearest contrast.

Step 1. Ask, "Can respiration occur in cells without being an inhalation movement?" Yes.

Step 2. Ask, "Does breathing itself break glucose and release energy?" No.

Step 3. Ask, "Is breathing physical and respiration chemical?" Yes.

Step 4. Ask why cells need oxygen brought by breathing. They use it during respiration.

Breathing supports respiration, but one is not another name for the other.

> **Final Answer:** Questions about **location and energy release** disprove Anil's claim.

Q 9.6 **Which statement is correct and why? Anu: We inhale air. Shanu: We inhale oxygen. Tanu: We inhale air rich in oxygen.**

SOLUTION

Concept used. Air is a mixture of gases. Inhaled air contains nitrogen, oxygen, carbon dioxide, and other gases.

Step 1. Shanu is incorrect because humans do not inhale pure oxygen.

Step 2. Anu is broadly correct, but does not identify the needed gas.

Step 3. Tanu correctly says inhaled air is rich in oxygen compared with exhaled air.

Step 4. Some oxygen enters blood, so exhaled air has less oxygen and more carbon dioxide.

☞ **Mixture**

Use “air rich in oxygen”, not “only oxygen”.

Final Answer: **Tanu is most correct**: we inhale air rich in oxygen, not pure oxygen.

EXPERT'S SOLUTION : *Sana Khan, Ph.D*
Environmental Science, IIT Delhi

Concept used. Compare inhaled and exhaled air. Both are mixtures, but their gas proportions differ.

Step 1. Outside air enters with nitrogen, oxygen, carbon dioxide, and other gases.

Step 2. In alveoli, some oxygen moves into blood.

Step 3. Carbon dioxide moves from blood into alveoli.

Step 4. Exhaled air therefore has less oxygen and more carbon dioxide.

Anu gives a general statement. Tanu gives the scientifically clearer statement.

> **Final Answer:** **Tanu is correct** because inhaled air is a mixture rich in oxygen.

Q 9.7 **We often sneeze when we inhale a lot of dust-laden air. What can be possible explanations?**

SOLUTION

Concept used. Nasal hairs and mucus trap particles. Dust irritates the nasal lining. Sneezing is a protective reflex.

Step 1. Dust-laden air enters through nostrils.

Step 2. Nasal hairs and mucus trap many particles.

Step 3. Much dust irritates nerve endings in the nasal lining.

Step 4. The body makes a sudden, forceful outward rush of air.

Step 5. This sneeze clears dust and protects deeper passages.

> ♥ **Protect others**
>
> Cover the nose and mouth while sneezing.

> **Final Answer:** Dust irritates the nasal lining, so sneezing expels particles and protects the respiratory passage.

EXPERT'S SOLUTION *: Arjun Verma, M.Sc Neurobiology, University of Hyderabad*

Concept used. Sneezing is automatic defence. Sensory nerves detect irritation, and breathing muscles create rapid outward airflow.

Step 1. Mucus catches inhaled dust and pollen.

Step 2. Excess particles stimulate receptors in the nose.

Step 3. A nerve signal reaches the reflex centre.

Step 4. The diaphragm and chest muscles produce a forceful air burst.

Step 5. The burst carries irritants away.

Repeated sneezing may also occur during an allergy or infection.

> **Final Answer:** Sneezing is a **protective reflex** triggered by dust irritation.

Q 9.8 **Paridhi and Anusha of Grade 7 started running for their morning workout. After they completed their running, they counted their breaths per minute. Anusha was breathing faster than Paridhi. Provide at least two possible explanations for why Anusha was breathing faster than Paridhi.**

SOLUTION

Concept used. Active muscles need more energy. Faster respiration needs more oxygen and produces more carbon dioxide, so breathing rises.

Step 1. Anusha may have run faster or farther, making her muscles need more oxygen.

Step 2. She may have lower fitness, so the same run required greater effort.

Step 3. She may have rested less before counting.

Step 4. Heat, tiredness, anxiety, or a respiratory condition could also raise breathing rate.

☞ **Fair comparison**

Both should run the same distance at the same pace and count immediately.

Final Answer: Reasons include **greater effort, lower fitness, shorter recovery, or health differences**.

EXPERT'S SOLUTION *: Nisha Patel, Ph.D Exercise Physiology, AIIMS New Delhi*

Concept used. Breathing responds to oxygen demand and carbon dioxide removal. Workload and personal condition both affect it.

Step 1. Faster running makes muscles use energy more quickly.

Step 2. A less-trained body may breathe faster for the same workload.

Step 3. Different counting times matter because breathing slows during recovery.

Step 4. Asthma, congestion, heat, stress, or fatigue may further increase the rate.

One count cannot prove a cause. Pace, distance, and counting time should be equal.

Final Answer: Two sound explanations are **higher exercise intensity and lower fitness**; recovery or health may also matter.

Q 9.9 **Yadu conducted an experiment to test his idea. He took two test tubes, A and B, and added a pinch of rice flour to the test tubes, half-filled with water, and stirred them properly. To test tube B, he added a few drops of saliva. He left the two test tubes for 35–45 min. After that, he added iodine solution into both the test tubes. Experimental results are as shown in Fig. 9.15. What do you think he wants to test?**

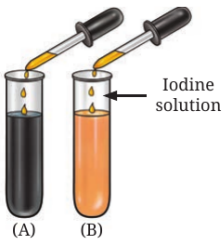

Fig. 9.15: Experimental results

Fig. 9.15, NCERT Curiosity Grade 7 Science, Chapter 9.

SOLUTION

Concept used. Rice flour contains starch. Iodine turns blue-black with starch. Saliva changes starch into simpler sugar.

Step 1. Both tubes begin with starch in rice flour.

Step 2. Only B receives saliva, the changed

factor.

Step 3. During waiting, saliva acts on starch in B.

Step 4. A turns blue-black because its starch remains.

Step 5. B stays brown or becomes lighter because much starch has been digested.

☞ **Variable**

Only the presence of saliva should change.

Final Answer: Yadu tests whether **saliva breaks starch into simpler sugar**.

EXPERT'S SOLUTION *: Vikram Rao, M.Sc Biotechnology, IIT Kharagpur*

Concept used. A is the comparison tube, while B has the treatment. Iodine colours show whether saliva removed starch.

Step 1. Keep rice flour, water, temperature, time, and iodine equal.

Step 2. Add saliva only to B.

Step 3. A's blue-black colour confirms starch is present.

Step 4. B's lighter colour shows less starch remains after saliva acts.

Step 5. The difference supports the claim that saliva digests starch.

Without tube A, the colour in B would be harder to interpret.

> **Final Answer:** The investigation demonstrates the **action of saliva on starch**.

Q 9.10 **Rakshita designed an experiment taking two clean test tubes, A and B, and filled them with lime water as shown in the figure. In test tube A, the surrounding air that we inhale was passed on by sucking air from the pipe, and in test tube B, the exhaled air was blown through the pipe (Fig. 9.16). What do you think she is trying to investigate? How can she confirm her findings?**

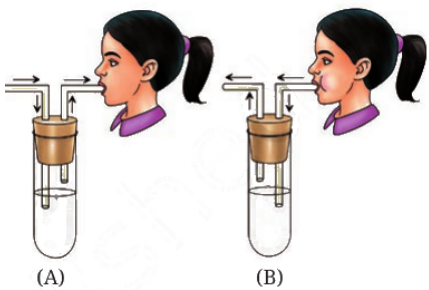

Fig. 9.16, NCERT Curiosity Grade 7 Science, Chapter 9.

SOLUTION

Concept used. Carbon dioxide turns clear lime water milky. Exhaled air has more carbon dioxide because respiration produces it.

Step 1. Pass similar amounts of surrounding and exhaled air through A and B.

Step 2. Observe the time and degree of

milkiness.

Step 3. B should turn milky sooner or more strongly.

Step 4. A changes more slowly because surrounding air has less carbon dioxide.

Step 5. Repeat using equal lime-water volumes and airflow times.

☞ **Safety**

Use supervised one-way apparatus so lime water cannot enter the mouth.

Final Answer: She tests whether **exhaled air has more carbon dioxide**. Faster milkiness in B confirms it.

EXPERT'S SOLUTION : *Tara Singh, Ph.D*
Pulmonary Medicine, PGIMER Chandigarh

Concept used. Lime water indicates carbon dioxide. Faster milkiness means more carbon dioxide passed through it.

Step 1. Label A for surrounding air and B for exhaled air.

Step 2. Keep lime-water amount, tube size,

and airflow duration equal.

Step 3. Pass the air samples without mixing their paths.

Step 4. Compare when turbidity appears. B should become milky first.

Step 5. Repeat trials. The same result reduces chance error.

Cells form carbon dioxide during respiration. Blood carries it to lungs for exhalation.

> **Final Answer:** Repeated faster milkiness in **B** confirms that exhaled air is richer in carbon dioxide.

Key Takeaways

- Food travels through the alimentary canal in a fixed order.
- Saliva starts starch digestion, while iodine tests for starch.
- The diaphragm helps inhalation and exhalation.
- Breathing moves air, while respiration releases energy in cells.
- Exhaled air contains more carbon dioxide than inhaled air.

Related Collegedunia Resources

Same chapter, other resources:

- Class 7 Science Curiosity - All Chapters

Continue learning:

- Class 7 Science Curiosity - All Chapters