EEE LABS

Foundation General Knowledge & General Science

Learn the idea. Read every option. Explain your answer.

25 units | Colour diagrams | Worked applications | Letter edition

Sainik / AISSEE and RMS
Class 6 and Class 9 entrance preparation

Candidate review edition (v126N) - 1 November 2026
1,330 admission questions, separated by exam and class within units. Candidate additions pending Codex review. NDA/CDS practice is supplied separately.

Using this book

Read each topic and its accompanying visual. Study the worked reasoning, attempt the Practice Questions, and check their separate solutions. Then attempt your exam/class PYQ section before consulting the separate recorded explanations.

Every option is a learning opportunity

For an incorrect option, ask what it actually means and when it would be correct. Keep a short comparison note. A wrong choice can expose a missing distinction: artery versus vein, weather versus climate, adoption versus commencement, or Internet versus Web.

What this edition includes

The manuscript combines newly written teaching with the existing illustrated Unit 3 and the extracted question bank. Historical stems and ordered options remain linked to the source archive. Whole-question crops are retained internally; only the necessary source illustrations are reproduced here. Diagrams are schematic unless labelled otherwise; Unit 3 artwork is illustrative, not photographic.

Two learning routes

Class VI: start with core lessons and Class VI questions. RMS lists Reasoning (linguistic, logical, mathematical) within General Knowledge and Current Affairs. The exam-pattern guide is on p.3. This book's reasoning lesson, worked examples and six practice questions with a separate answer leaf are on pp.554-556. For related practice, see Foundation Mathematics pp.153-158 (writing expressions from stories; checked solutions) and Foundation English pp.4, 8-9 (careful wording, position words, NOT/except). Class IX: also use labelled extensions and Science/Social Science; RMS names no separate Class IX GK paper. Keep your own exam syllabus beside you.

RMS syllabus revision

This review candidate contains newly written and reviewed teaching additions in response to the supplied RMS CET-2026 prospectus. The prospectus names NTA as the examining agency. Older papers remain historical practice, not a prediction of the new examination. This candidate does not certify full syllabus coverage.

Review status

REVIEW DRAFT. This 569-page candidate combines reviewed and unreviewed additions. Some Class IX material extends beyond core lessons. Provisional keys and source holds remain distinct. Full syllabus and all 1,330 question-option concepts are not yet verified; current print preflight and Kindle/KDP preview are also incomplete.

Dated revision selection

Selected dated supplements cover specified national and international observances, awards, science and sport facts through 26 October 2026. They are not an exhaustive current-affairs digest. Recheck changing facts before using a later edition; original question-source uncertainties remain explicit.

Answer-status legend

Provisional: editorial answer awaiting verification. Source-linked key: source-batch key linkage, not independently reapproved in this edition. Do not score: unresolved answer or source figure. Answer explanations remain review material, not a newly verified official answer key.

Know the examination you are preparing for

The same subject can have a different place, weight and time allowance in each entrance paper. These are the latest official patterns available for AISSEE-2026 and RMS CET 2026-27; check the notice for your own session.

AISSEE (NTA) - 2026 reference

Class VI

125 MCQs | 300 marks | 150 minutes

Language: 25 questions / 50 marks
Mathematics: 50 / 150; Intelligence: 25 / 50
General Knowledge: 25 / 50
Paper-pencil OMR. The 2026 bulletin states no negative marking.

Class IX

150 MCQs | 400 marks | 180 minutes

Mathematics: 50 / 200; Intelligence: 25 / 50
English: 25 / 50; General Science: 25 / 50
Social Science: 25 / 50
There is no separate GK section. The 2026 bulletin states no negative marking.

Rashtriya Military Schools CET - 2026-27 reference

Class VI

200 marks | 150 minutes

English: 50 / 50; qualifying only, not counted in merit (35% minimum).
Intelligence: 50 / 50; Mathematics: 50 / 50.
General Knowledge and Current Affairs: 50 / 50 (40% minimum).
Interview: 20 additional marks.

Class IX

200 marks | 150 minutes

Paper 1: English 50, Hindi 20, Social Science 30.
Paper 2: Mathematics 50, Science 50.
Each paper is 100 marks; minimum 50% per paper

No separate GK section. Interview: 50 additional marks.

What this means for your GK preparation

For Class VI, GK is a named, scored section in both patterns above. For Class IX, neither pattern has a standalone GK section: AISSEE tests General Science and Social Science; RMS includes Social Science. Use general-awareness lessons to build context, but study every subject in your current official syllabus.

Practise the idea and the paper

- Before a previous-year question (PYQ), identify its exam, class and year; do not transfer one paper's subject mix or marking rules to another.
- Read the whole stem, explain why the right option fits, and compare it with plausible alternatives.
- Try questions before opening solutions. Later, practise to the time and answer-sheet instructions in your current prospectus.

Question-bank records in this book - not live-paper totals: AISSEE VI 200; AISSEE IX 250; RMS VI 400; RMS IX 480. Alternate scans are not counted as new records. No Navodaya or RIMC GK coverage is implied.

Sources: NTA, AISSEE-2026 Information Bulletin, sections 4.3-4.4; RMS CET-2026 Prospectus, section 6, printed p.9. Official sites: exams.nta.nic.in/sainik-school-society/ and apply-delhi.nielit.gov.in.

Patterns and syllabuses can change. Confirm your current session notice. This question bank is preparation support, not proof of complete syllabus coverage and not a promise of marks or admission.

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UNIT 01

Your body and your senses

Start with a question: Why is the pulmonary vein a vein even though it carries oxygen-rich blood?

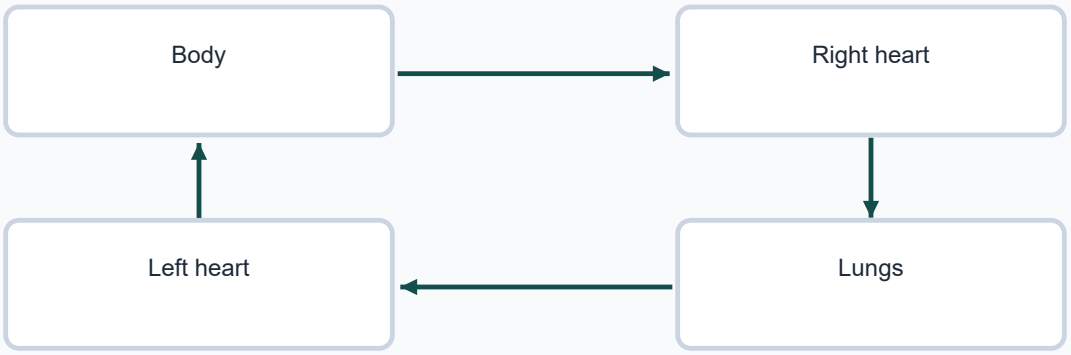
Your route through this unit

Follow the blood, not its colour → Systems cooperate → Control, support and movement

Topic 1: Follow the blood, not its colour

An artery carries blood away from the heart; a vein carries blood towards it. In the usual circulation after birth, the right side pumps blood to the lungs and the left side pumps it to the body. Gas exchange in the lungs adds oxygen and removes carbon dioxide. Pulmonary arteries go from heart to lungs; pulmonary veins return from lungs to heart. This direction rule works better than memorising that all arteries contain oxygen-rich blood.

Blood makes two linked journeys



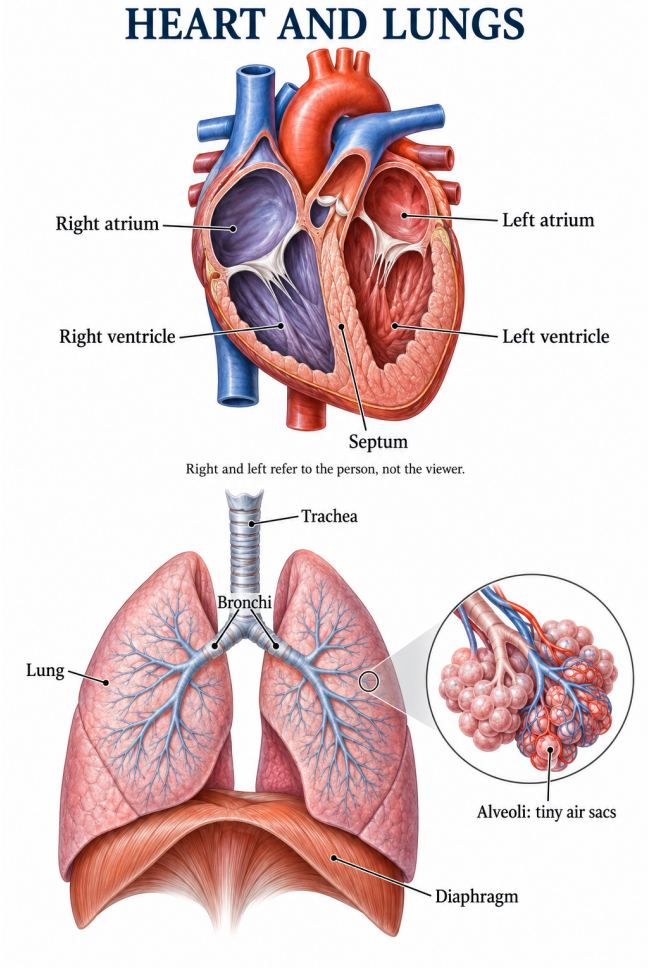
Arteries travel away from the heart; veins return. Labels show the usual post-birth circuit.

Before the hormone questions

Study endocrine messages and hormone roles on p.600. Start independent practice on p.601; check the separate answers on pp.603-604. Sources and further reading are on p.604.

Visual guide: p.609.

Visual study: Read the heart and lungs



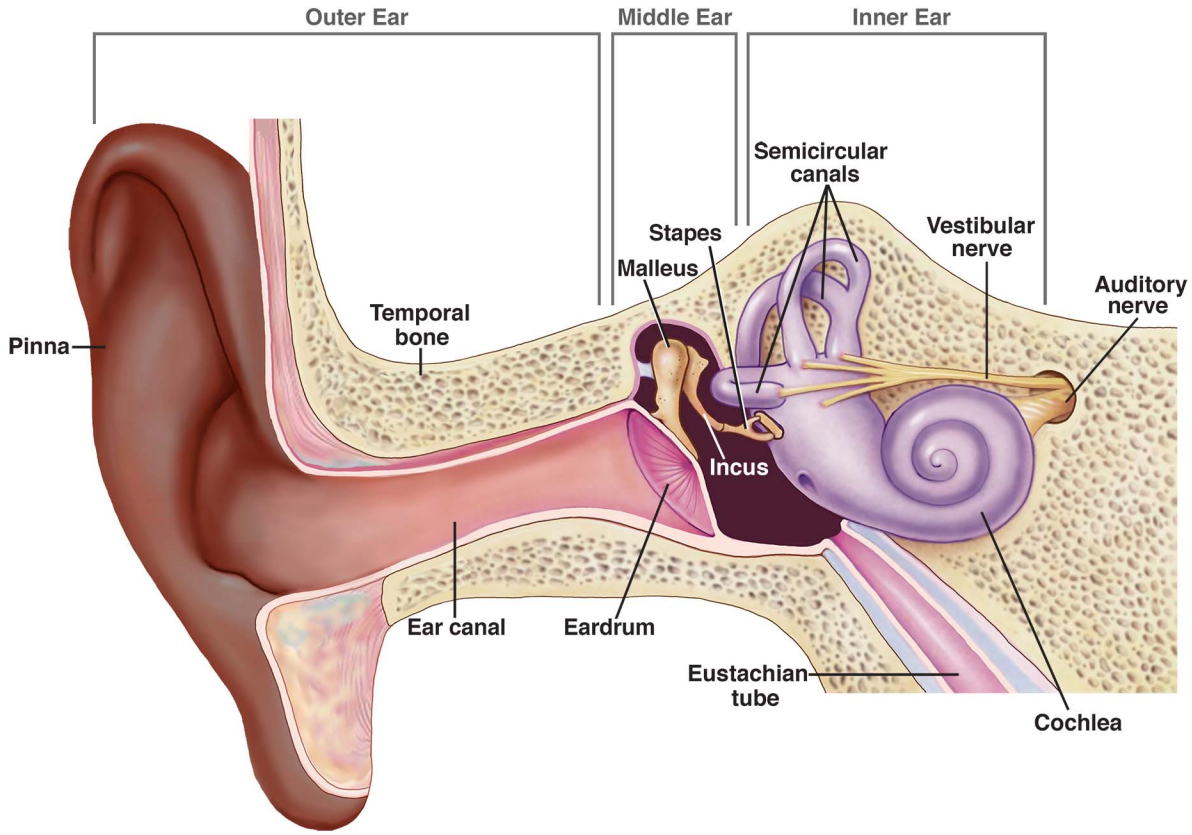
Locate the four chambers. The right side sends blood to the lungs; the left side sends it to the body. The septum separates the two sides. Blue is a diagram convention for oxygen-poor blood: real human blood is never blue.

Trace the air route: trachea → bronchi → smaller branches → alveoli. Oxygen enters the blood at the alveoli; carbon dioxide leaves it. As you breathe in, the diaphragm contracts and moves down. Identify the air sacs before looking at the label.

Teaching reference: NHLBI: blood flow through the heart

Detailed heart plate: p.581.
Separate circulation answer: p.583.

Visual study: how the ear carries sound information



Anatomical cutaway, not to scale. Source: NIH/NIDCD, Parts of the Ear (public domain).

Follow the sound: pinna and ear canal -> eardrum -> malleus, incus and stapes -> oval window -> cochlea. Hair cells in the cochlea convert mechanical movement into electrical signals carried towards the brain by the auditory nerve.

Different jobs: the semicircular canals help detect head rotation. The Eustachian tube connects the middle ear to the throat region and helps equalise pressure across the eardrum.

Recall the circulation lesson

Worked application. Blood leaves the heart for the lungs. Should the vessel be called a vein because this blood has little oxygen?

Reasoning. Use direction first: the blood is leaving the heart, so the vessel is an artery. Its destination makes it a pulmonary artery. Oxygen content and direction describe different features.

Avoid the trap: An artery is not defined as a vessel containing oxygen-rich blood.

Practice 1. Trace a full journey from the body, through the lungs, and back to the body. Name the two heart sides in order.

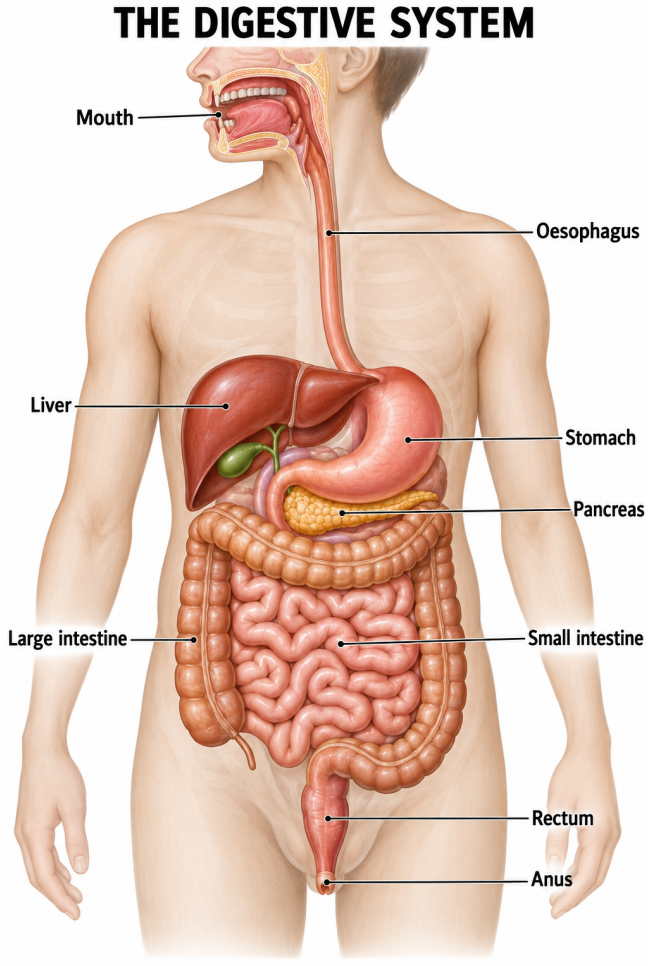
Topic 2: Systems cooperate

Digestion breaks food into absorbable substances. Salivary amylase starts starch digestion in the mouth; most nutrient absorption occurs in the small intestine. The lungs exchange gases, the blood transports substances, and the kidneys filter blood and regulate water and salts while forming urine. Red blood cells transport oxygen with haemoglobin. White blood cells contribute to defence; platelets help clotting. These are different tasks, not four names for the same process.

Practice 1 answer: p.583.

Detailed heart plate: p.581.

Visual study: Follow a mouthful of food



Trace: mouth → oesophagus → stomach → small intestine → large intestine → rectum → anus. The liver and pancreas add digestive secretions; food does not travel through them. Most nutrient absorption takes place in the small intestine.

Read the picture: the large intestine frames the coiled small intestine. It absorbs water from the remaining material; the rectum stores stool before it leaves through the anus. “Small” describes the narrower tube, not the shorter one.

Teaching reference: NIDDK: your digestive system

Worked application

A meal has reached the small intestine. Why does the body still need blood circulation?

REASONING

Digestion and absorption make nutrients available, but most body cells are not next to the intestine. Absorbed nutrients must be transported. The digestive and circulatory systems therefore carry out connected, different tasks.

Avoid the trap: Absorbing food, exchanging gases and filtering blood are different processes.

Try it yourself

Practice 2. Match each task to an organ: exchange gases; absorb most nutrients; form urine. Explain why one organ cannot replace the other two.

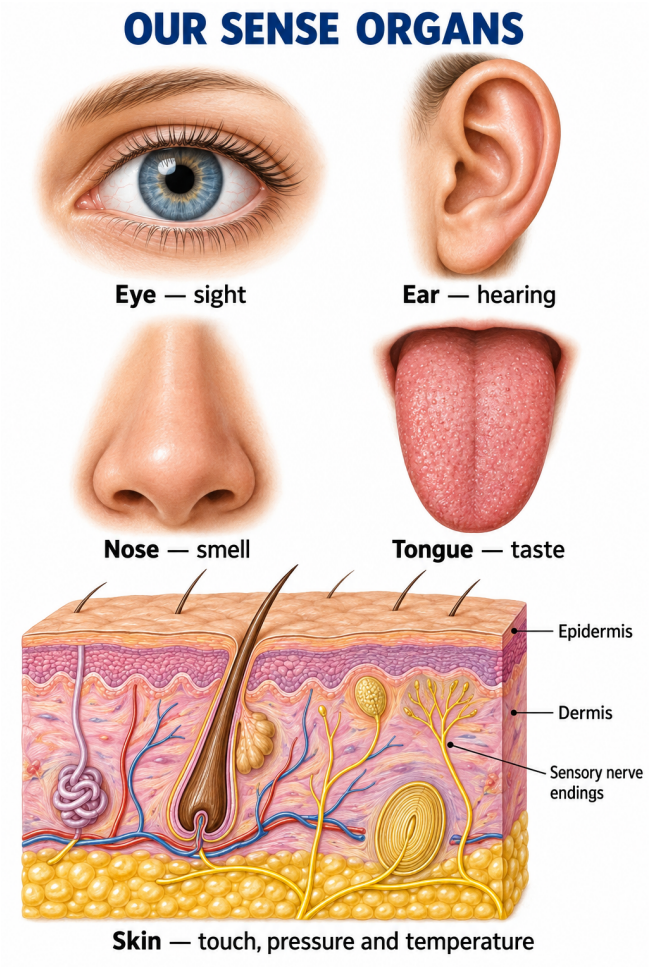
Detailed digestive plate: p.580.

Practice 2 answer: p.583.

Topic 3: Control, support and movement

The brain and spinal cord form the central nervous system. The cerebrum supports conscious thought and voluntary action; the cerebellum helps coordination and balance; the medulla controls vital involuntary functions. Muscles pull on bones through tendons. Ligaments connect bones at joints. A hinge allows bending and straightening; a ball-and-socket allows movement in several directions, within anatomical limits. The typical adult skeleton has 206 bones, but natural variation exists.

Visual study: Senses send information



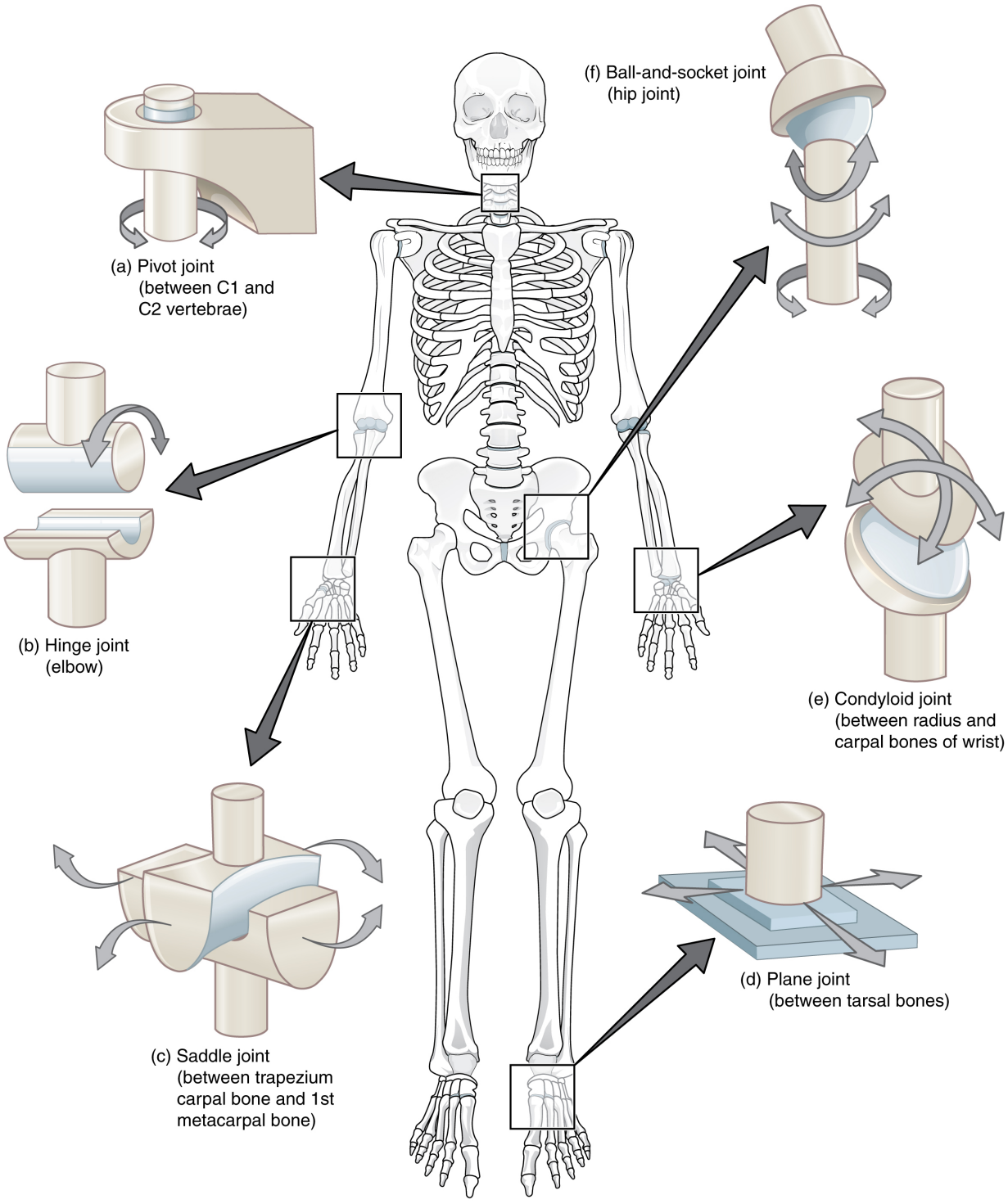
Receptors detect stimuli and nerves carry signals to the brain. In the eye, the iris regulates pupil size; the lens helps focus light on the retina. In the ear, vibrations pass from the eardrum through tiny bones to the cochlea. The inner ear also helps with balance.

Smell and taste work together to produce flavour. There are no exclusive sweet, sour, salty or bitter zones on the tongue. Skin contains different receptors for touch, pressure and temperature. Check: the iris controls the opening; the retina detects light.

Teaching reference: NIDCD: how taste works

Skin layers plate: p.582.
Separate skin answer: p.584.

Visual study: identify the joint, explain the movement



Synovial (freely movable) joints: simplified mechanisms, not to scale. Black arrows locate examples; curved arrows show movement. (c) is at the thumb base; (d) is between tarsal bones, not the main ankle hinge.

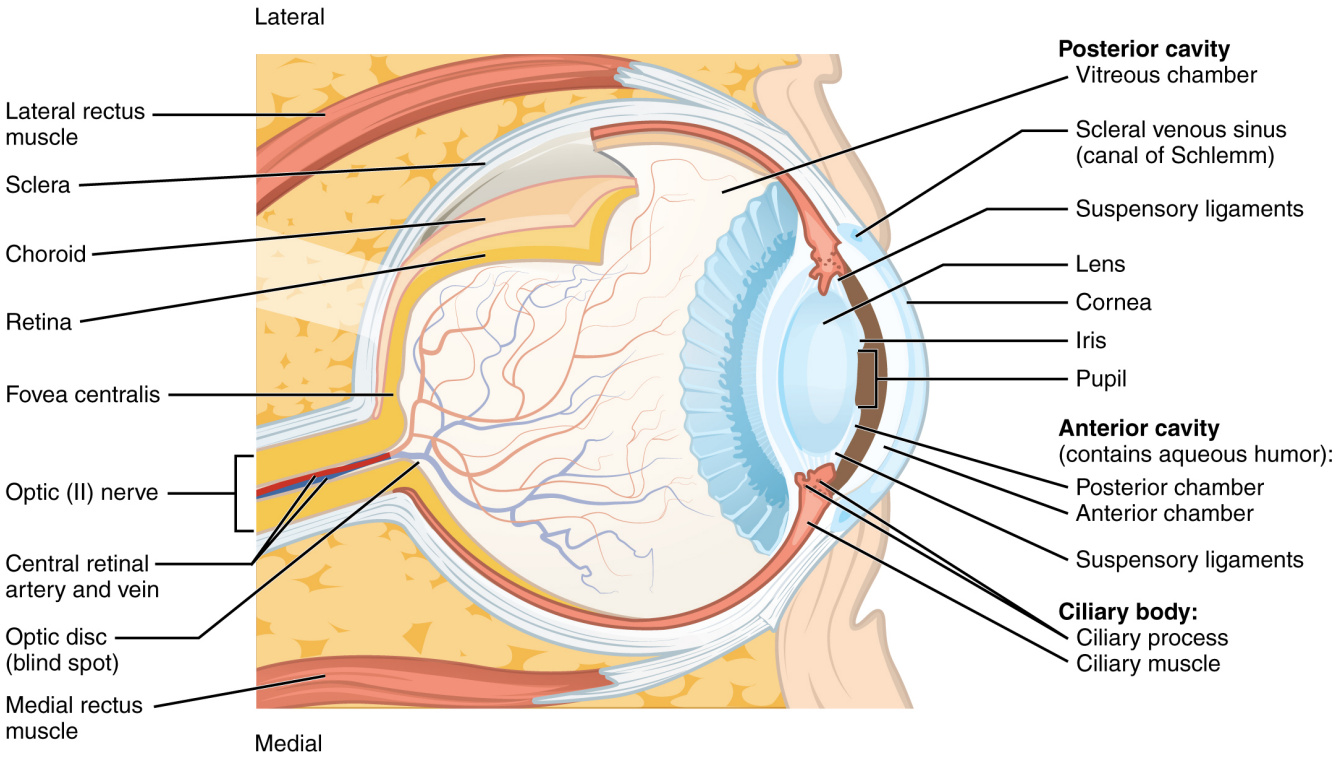
OpenStax College, Types of Synovial Joints (2013). CC BY 3.0. Reproduced without alteration.
Source: Wikimedia Commons. Licence: creativecommons.org/licenses/by/3.0

At the elbow, the humerus meets the radius and ulna. The hinge action mainly bends and straightens the arm. The shoulder lets the upper arm move in several directions because the rounded head of the humerus fits into a socket on the scapula.

Ligaments connect bone to bone; tendons connect muscle to bone. Cartilage helps joint surfaces move smoothly. Real joints have limits: a ball-and-socket joint does not allow unlimited rotation. Test yourself: which joint helps you bend your elbow, and which helps you circle your arm?

Visual study: inside the eye

The iris controls pupil size; the lens focuses light on the retina. The fovea and the optic nerve exit (blind spot) are different locations.



OpenStax College, Anatomy & Physiology, Figure 1413: Structure of the Eye (2013). CC BY 3.0.
Reproduced without alteration. Source: Wikimedia Commons; licence: creativecommons.org/licenses/by/3.0

Start with the core labels: cornea, pupil, iris, lens, retina and optic nerve. Light enters from the front at the right of this cutaway, passes through the cornea, pupil and lens, and reaches the retina. The optic nerve carries signals towards the brain. Other labels give extra anatomical detail.

Recall: muscles and joints

Worked application. A muscle pulls and the forearm bends. Which connection transmits the pull to a bone?

Reasoning. A tendon connects muscle to bone. When the muscle contracts, force is transmitted through that connection. A ligament connects bone to bone and helps stabilise a joint; it is not a substitute for the tendon.

Avoid the trap: Muscles pull through tendons; ligaments are not muscles.

Practice 3. Compare an elbow movement with a shoulder movement. Which joint allows the wider range, and does that mean unlimited movement?

Connect and compare

Structure	Function / distinction
Alveoli	Gas exchange between air and blood
Small intestine	Most nutrient absorption
Kidney	Filtration and regulation; urine formation
Cerebellum	Coordination and balance
Tendon / ligament	Muscle-to-bone / bone-to-bone

Bring the ideas together

A vessel returns blood from the lungs to the heart. Name it and explain your choice.

Worked reasoning

Returning towards the heart makes it a vein. Its connection to the lungs makes it a pulmonary vein. Oxygen content confirms the usual post-birth circuit but does not define the word vein.

Unit review - answer without looking back

Explain the difference between a tendon and a ligament.

After checking, revisit the named topic for any answer you could not explain. These Practice Questions are newly written, not historical exam questions.

Practice solutions

1. Follow the blood, not its colour

Trace a full journey from the body, through the lungs, and back to the body. Name the two heart sides in order.

Body → right heart → lungs → left heart → body. The lung circuit adds oxygen before the left heart sends blood to the body.

2. Systems cooperate

Match each task to an organ: exchange gases; absorb most nutrients; form urine. Explain why one organ cannot replace the other two.

Lungs; small intestine; kidneys. Each has a different structure and role. Transport by blood links them, but does not make their functions interchangeable.

3. Control, support and movement

Compare an elbow movement with a shoulder movement. Which joint allows the wider range, and does that mean unlimited movement?

The shoulder ball-and-socket joint allows movement in more directions than the elbow hinge action. Anatomical structures still limit the range.

4. Unit review

Explain the difference between a tendon and a ligament.

A tendon joins muscle to bone; a ligament joins bone to bone.

Build your exam foundations

Sensing is more than seeing

Class 6 core

A stimulus is a change that an organism can detect. Light, sound, pressure and chemicals can provide information. Receptors detect a stimulus; nerves carry signals; the brain processes them. An eye receives light reflected from an object: it does not send out a beam to find that object. The iris changes pupil size; the lens helps focus light on the retina.

Animals do not all sense the world in the same way. Dogs use smell to follow scent trails. Ants can communicate through chemical trails. Many bats locate objects by sending out sound and detecting its echoes. This is echolocation, not proof that bats cannot see. Whiskers help some mammals detect nearby surfaces and movements.

Plants also respond to their surroundings. A shoot may bend towards light as it grows; roots commonly grow downwards in response to gravity. Touch-me-not leaves fold when touched. Plants do not need eyes, ears or an animal nervous system to respond. A growth response and a rapid leaf movement are different processes.

Information	Receiver or example
Light	Eye; growth of shoots towards light
Chemicals	Smell receptors; ant scent trails
Echoes	Many bats locating objects

Worked application

A bat avoids a wire in dim light. Must it have touched the wire first?

No. In an echolocating bat, returning echoes supply information about nearby objects before contact. The useful distinction is detection at a distance versus detection by touch.

Practice Questions

1. A potted shoot bends towards a window. Is this the same mechanism as an animal turning its head towards a sound?

Delayed answer: see Unit 1 solutions, p.54.

Growing up: chemical messages

Class 9 extension

Adolescence is the transition between childhood and adulthood. Puberty is the stage when reproductive organs mature and characteristic bodily changes occur. Timing varies: height, voice and body shape do not change on an identical timetable for every person. Physical maturity alone does not mean emotional or social maturity.

Endocrine glands release hormones into the blood. Hormones act on responsive tissues and help regulate growth, metabolism and reproduction. The pituitary influences several other endocrine glands. The thyroid produces thyroid hormones, for which iodine is needed. The pancreas has cells that produce insulin, which helps regulate blood glucose. Adrenal glands produce hormones including adrenaline.

During puberty, sex hormones contribute to development of reproductive functions and secondary sexual characteristics. Testes produce testosterone; ovaries produce hormones including oestrogens and progesterone. Menstruation is part of a reproductive cycle; it is not an illness. Balanced food, activity, hygiene and trusted adult guidance support wellbeing. Textbook hormone associations are not a basis for diagnosing an individual.

Gland	A useful association
Thyroid	Iodine and thyroid hormones
Pancreas	Insulin and blood glucose
Adrenal	Adrenaline and stress response

Worked application

Why can a hormone released in one organ affect another part of the body?

It travels through the blood and acts on cells able to respond to it. The gland does not need a separate physical tube leading to each target.

Practice Questions

2. Distinguish puberty from adolescence, and explain why two classmates may begin puberty at different times.

Extend your exam foundations

Use the following comparisons to read every option: health and transmission; cells and glands; sensing and digestion; Class 9 hormones and reproduction; measurements and dated health records. Nutrition links point to Unit 2. Attempt the Practice Questions before the separate solutions.

Health 1: Infection is different from deficiency

A communicable disease involves an infectious agent that can spread between hosts, directly or through a route such as food, water or a vector. Chickenpox and measles are caused by viruses; the common cold is also usually viral. A non-communicable condition is not passed from person to person in this way. Beriberi results from vitamin B1 deficiency. Diabetes involves disturbed blood-glucose regulation; Alzheimer disease affects the brain; cancer involves uncontrolled cell growth. These conditions are not caught through ordinary contact, although some infections can increase the risk of particular cancers. Asthma is an airway condition, not a communicable infection. Typhoid is a bacterial infection, generally spread through contaminated food or water. A name alone does not tell you the route: compare cause, affected organ and transmission separately.

Worked application

A revision chart calls every illness an infection and puts beriberi beside measles. Repair the classification and explain your test.

Measles is viral and communicable; beriberi is a nutritional deficiency and non-communicable. The test is the cause and transmission route, not whether an illness can be serious. Chickenpox/common cold join the infection group; diabetes, Alzheimer disease and cancer do not spread through ordinary contact.

Practice Questions

Additional practice 1. Classify chickenpox, beriberi, asthma and typhoid as infection, nutritional deficiency or another non-communicable condition. Why is severity not the classification rule?

Health 2: Cause, vector and affected organ are three different labels

Disease	Agent	Vector
Malaria	Plasmodium parasite	Anopheles mosquito
Dengue	Virus	Mainly Aedes mosquito
Lymphatic filariasis	Parasitic worms	Mosquitoes
Sleeping sickness	Trypanosome parasite	Tsetse fly

A pathogen is an agent that causes disease. Bacteria are cells; viruses depend on host cells to reproduce; protozoa are single-celled organisms; parasitic worms are multicellular animals. A vector carries an infectious agent between hosts. Malaria is caused by Plasmodium parasites and transmitted by infected female Anopheles mosquitoes. Dengue is viral and transmitted mainly by Aedes mosquitoes. Lymphatic filariasis is caused by parasitic worms and spread by mosquitoes. Human African sleeping sickness is caused by trypanosome parasites and transmitted by tsetse flies. The mosquito or fly is the vector, not the pathogen. Many malaria vectors bite around dusk, at night or at dawn, but species and local patterns differ; no single clock interval defines every malaria mosquito.

Worked application

> A student says that malaria and sleeping sickness have the same vector because both are parasitic diseases. Is the reasoning valid?

No. Malaria involves Plasmodium and an Anopheles mosquito; sleeping sickness involves trypanosomes and a tsetse fly. Similar causes at the broad parasite level do not establish identical vectors. Measles is viral and is not a mosquito-borne disease.

Practice Questions

Additional practice 2. Match: malaria, dengue, lymphatic filariasis, sleeping sickness. Vectors: Anopheles mosquito, Aedes mosquito, mosquito, tsetse fly. Then explain why a rigid nightly time range is a poor universal rule.

Health 3: Compare names without diagnosing a person

Meningitis is inflammation of the meninges, the membranes around the brain and spinal cord. Migraine is a neurological disorder commonly associated with recurrent headache and other symptoms. Both have nervous-system relevance, so a question merely asking which disease is related to the brain may be ambiguous. Jaundice describes yellowing associated with excess bilirubin; it is a sign with several possible causes, not one uniquely named infection. Diabetes concerns persistently abnormal blood-glucose regulation. These descriptions help classify textbook terms. They do not establish a diagnosis from a headache or a skin colour. In the brain, the cerebrum supports thought and voluntary activity; emotional processing involves connected regions, including limbic circuits. The cerebellum contributes to coordination; the medulla and pons have important brainstem functions.

Worked application

> A multiple-choice item lists meningitis and migraine, then asks only for a condition related to the brain. Should you force one unique answer from that wording?

No. Both have nervous-system relevance. The stem needs a more specific defining feature, such as inflammation of the meninges, to distinguish meningitis. A printed letter does not repair a broad premise.

Practice Questions

Additional practice 3. Which description identifies meningitis more precisely: recurrent headache, inflammation of meninges, or high blood glucose? Explain why jaundice is not a single diagnosis.

Health 4: What different specialists study

A paediatrician specialises in children and their health. A cardiologist focuses on the heart and cardiovascular conditions. A neurologist deals with disorders of the nervous system, including the brain, spinal cord and nerves. These medical specialities are organised by patient group or body system. A geologist is a scientist who studies Earth materials, structures and processes; geology is not a medical speciality. The word parts can help recall: cardio relates to the heart; neuro to nerves; geo to Earth. The medical role is different from naming a body organ, and a broad speciality does not imply that every practitioner performs every procedure.

Worked application

A school display pairs geologist with children, paediatrician with rocks and cardiologist with the heart. Which associations need repair?

Geologist - Earth and rocks; paediatrician - children; cardiologist - heart. The third association was already correct. Neurologist belongs with the nervous system rather than all internal organs generally.

Practice Questions

Additional practice 4. Match paediatrician, cardiologist, neurologist and geologist to children, cardiovascular system, nervous system and Earth science. Which one is not a medical speciality?

Body 1: Cells share work through tissues and organs

Cell	Tissue	Organ	Organ system
Specialised unit	Related cells	Several tissue types	Cooperating organs
Muscle cell	Muscle tissue	Stomach	Digestive system

A cell is the basic structural and functional unit of the body. Cells with related characteristics and functions form tissues. Different tissues combine in an organ; organs cooperate in an organ system. A stomach contains muscle, epithelial, connective and nervous tissues working together. This organisation permits division of labour: muscle cells contract, nerve cells carry signals and lining cells provide protection or absorption. Tissue organisation is not simply faster development, greater reproductive potential or extra strength, although specialised tissues may contribute to those outcomes. Organs contain more than one tissue type, so a body part cannot usually be described by a single cell function.

Worked application

Put muscle cell, muscle tissue, stomach and digestive system in order from smaller organisation to larger. What makes this more than a list of sizes?

Cell - tissue - organ - organ system. Each level combines structures into a working function. The stomach has several tissue types; the digestive system combines several organs.

Practice Questions

Additional practice 5. Give the four organisational levels in order. Explain how division of labour allows nerve and muscle cells to cooperate rather than perform identical tasks.

Body 2: A gland is identified by secretion

A gland produces and releases a substance. Salivary glands release saliva through ducts into the mouth. The liver produces bile and is conventionally described as the largest gland in the human body; it also carries out many other functions. The lungs exchange gases, while the stomach churns food and secretes digestive substances. Sweat glands release sweat, helping heat loss when it evaporates. Eccrine sweat glands occur on the scalp, armpits and palms, but are absent from the red surface of the lips. Sebaceous glands produce oily sebum, not sweat. Increased sebum production and blocked hair follicles contribute to acne during puberty. Sweat, oil and saliva therefore differ in source and function; the presence of sweat glands does not imply the presence of sebaceous glands in the same distribution.

Worked application

> A card says palms have no glands because they have no hair, and calls sebum the same substance as saliva. Correct both errors.

Palms have many eccrine sweat glands even though they lack hair follicles. Sebum is skin oil from sebaceous glands; saliva comes from salivary glands. The usual exam contrast places the red lip surface outside the sweat-gland distribution.

Practice Questions

Additional practice 6. Identify the secretion: salivary gland, sebaceous gland, sweat gland and liver. Which listed site lacks eccrine sweat glands: scalp, armpit, palm or red lip surface?

Body 3: Transport, control and exchange cooperate

The circulatory system delivers oxygen and nutrients; the respiratory system exchanges oxygen and carbon dioxide; the nervous system coordinates rapid signals and many involuntary functions; the reproductive system produces gametes and supports reproduction. The brain needs a continuing oxygen supply carried by blood. Reduced cerebral blood flow can cause fainting, although fainting can have several causes. Heart, lungs, liver and kidneys therefore are not interchangeable: the heart pumps, the lungs exchange gases, the liver processes substances and produces bile, and the kidneys regulate the blood composition and form urine. Nervous control also interacts with chemical hormonal control. Do not identify the system controlling an organ merely from what that organ transports. The reproductive system produces gametes and supports reproductive processes; it does not replace circulatory transport or nervous coordination.

Worked application

> A student says the brain can obtain oxygen directly from nearby air, so it does not need heart and lung cooperation. Explain the missing steps.

Air reaches the lung alveoli. Oxygen enters blood, the heart pumps it and blood delivers it to the brain. The brain processes signals, but it does not replace the lungs as the principal gas-exchange organ.

Practice Questions

Additional practice 7. Match heart, lungs, liver and brain to pumping blood, gas exchange, bile production and processing nervous signals. Which two systems link oxygen uptake to delivery? Also match reproductive system to gamete production, and nervous system to coordination. Why are these different jobs?

Senses 1: Sound follows a pathway; loudness is not pitch

The pinna collects sound towards the ear canal. Sound reaches the eardrum, whose vibrations pass through the middle-ear bones to the inner ear. In the cochlea, hair cells convert mechanical movement into signals carried by the auditory nerve. This order is different from listing all parts alphabetically. Loudness is associated with sound level, commonly measured in decibels; pitch depends mainly on frequency. A loud sound can damage hearing, especially with long or repeated exposure. The risk depends on level, duration and other factors, rather than a guarantee that every sound above one number immediately causes damage. NIDCD notes that long or repeated exposure at or above about 85 dBA can cause hearing loss. That is a hearing-risk statement, not a cause of typhoid or asthma.

Worked application

> Arrange pinna, auditory nerve, eardrum, ear canal and inner ear as a route. Explain why louder does not necessarily mean higher-pitched.

Pinna - ear canal - eardrum - middle-ear transmission - inner ear - auditory nerve. The source may abbreviate the middle-ear step. Loudness concerns level; pitch concerns frequency, so they can vary independently.

Practice Questions

Additional practice 8. Put eardrum, pinna, auditory nerve, cochlea and ear canal in order. Why must a hearing-risk explanation include exposure duration?

Senses 2: Detecting danger differs from sending a warning

Taste buds contain receptor cells that respond to dissolved chemicals in food. Smell contributes to flavour; teeth break food mechanically; the skin detects stimuli such as touch and temperature. A sphincter is a ring of muscle regulating an opening, not a taste receptor. Different animals use different sensory information. Ants detect chemical trails, while many bats use returning echoes. A langur may see danger and then produce an alarm call: sight detects the danger and sound carries the warning to others. The question must distinguish detecting a threat from communicating it. Humans, rabbits and monkeys also use smell; a school super-sense question selects a characteristic example rather than proving that other animals cannot smell. Unit2, From tasting to absorbing, develops the food pathway further.

Worked application

> A langur sees a predator and gives an alarm call. A student labels both stages hearing. What distinction repairs the answer?

Visual detection uses sight; giving an alarm involves a sound signal. Other animals can hear that signal. Similarly, an ant chemical trail is not an echo, and a bat echo is not the same as smell.

Practice Questions

Additional practice 9. Match taste buds, teeth, sphincter and skin to chemical taste reception, mechanical chewing, regulation of an opening and sensory protection. Name the information used by an ant trail and an echolocating bat. Does the ant/bat comparison prove that rabbits and monkeys cannot smell, or establish a universal strongest sense of smell?

Food link: Nutrients, growth and useful mineral comparisons

Proteins supply amino acids used in growth and repair. Carbohydrates and fats can supply energy; vitamins and minerals support particular body functions, so a growing child needs a varied diet rather than protein alone. Rice is a useful energy source; dal supplies protein as well as other nutrients; milk supplies protein and calcium; leafy vegetables contribute several vitamins and minerals. A menu should be considered as a whole, not judged from one good ingredient beside several less-balanced choices. Vitamin A supports vision, B1 deficiency causes beriberi, C deficiency causes scurvy and D supports calcium absorption and bone health. Vitamin E is an antioxidant; an old reproduction label should not be mistaken for a diagnosis or a reason to take supplements. Calcium is associated with milk and teeth; limestone contains calcium carbonate. Iron has a haemoglobin role; sodium and potassium contribute to nerve and fluid functions. Continue in Unit2 for nutrition and deficiency comparisons. In a retained historical question, Vitamin E is paired with Reproduction. Treat that as historical exam wording rather than a complete modern account, an authenticated official key or evidence of fertility benefit.

Worked application

> Compare a rice-dal-vegetable-milk menu with a snack menu containing one vegetable. Why is the presence of one healthy ingredient not sufficient?

The first combines energy, protein and varied micronutrients. A single vegetable does not make every other component balanced. Calcium belongs with milk/teeth/limestone associations, while iron is a different mineral linked to haemoglobin.

Practice Questions

Additional practice 10. Correct these pairs: vitamin A - scurvy; vitamin C - night blindness; vitamin D - bone health. Then match protein, iron and calcium to growth/repair, haemoglobin and bones/teeth. Which vitamin has the historical reproduction label in the retained question, and why is that not the same as proving fertility benefit?

Digestion link: Mixing, absorption and bodily state

The food pipe carries food to the stomach. Stomach muscles mix and churn it with digestive juices; the small intestine carries out much digestion and most nutrient absorption. The large intestine absorbs water from the remaining material. Small refers to diameter: the small intestine is generally longer than the large intestine, not shorter. The femur is the longest bone, which is a different comparison from the length of an intestinal tube. Brain and gut signals interact, and stress or emotional state can affect gastrointestinal activity. This does not mean that every sad person fails to digest a meal, or that all digestive difficulty has an emotional cause. Separate the definite muscular churning fact from an overgeneralised emotional statement. Unit2 provides the food-and-digestion application sequence.

Worked application

> A student calls the large intestine the longer tube and says sadness stops digestion in everybody. Repair both statements.

Large describes the wider diameter; the small intestine is generally longer. Emotional state can influence gut activity, but the absolute statement about everybody is not established. Digestion, absorption and emotional influence are distinct ideas.

Practice Questions

Additional practice 11. Match stomach, small intestine and large intestine to churning, most nutrient absorption and water absorption. Why can longest bone and longest intestinal part have different answers?