SCIENCE 8 — QUARTER 1 STUDENT REVIEWER

Digestive System • Excretory System • Mendelian Genetics • Vitamins & Minerals

How to use this reviewer: Read each statement aloud, then cover the answer and try to recall it. Focus on the **bold terms** and the flow diagrams.

1. DIGESTIVE SYSTEM

• **Digestive system:** It ingests food, breaks food into smaller absorbable molecules, absorbs nutrients, and eliminates nondigestible wastes.

• **Parotid gland:** It is located just anterior and inferior to the ears.

• **Saliva:** It moistens food, helps remove microbes, and begins carbohydrate digestion.

• **Amylase:** It aids in the digestion of carbohydrates.

• **Canines:** They help tear food.

• **Bolus:** It is the mixture of chewed food and saliva.

• **Peristalsis:** It is the rhythmic contraction of the alimentary canal that moves food forward.

• **Small intestine order:** duodenum → jejunum → ileum.

• **Bile:** It is produced by the liver and stored in the gallbladder.

• **Large intestine order:** cecum → colon → rectum → anal canal.

• **Sodium bicarbonate:** It helps neutralize acidic chyme in the small intestine and is produced by the pancreas.

• **Accessory digestive organs:** gallbladder, liver, pancreas, and salivary glands.

• **Pancreatic enzymes:** amylase acts on carbohydrates, lipase acts on fats, and trypsin acts on proteins.

• **Liver:** It detoxifies blood, secretes bile, and stores glucose as glycogen. It is not described in the exam source as a digestive-enzyme-producing organ.

• **Jaundice:** It is associated with yellowing of the skin and whites of the eyes.

• **Water:** It is needed by digestive enzymes for chemical breakdown of food.

• **Final products:** carbohydrate digestion produces glucose; protein digestion produces amino acids.

Food pathway: mouth → esophagus → stomach → small intestine → large intestine

2. EXCRETORY SYSTEM

• **Lungs:** They excrete carbon dioxide and water vapor. Removing CO■ helps maintain the acid-base balance (pH) of the blood.

• **Liver:** It breaks down ammonia into urea and excretes bilirubin.

• **Large intestine:** It eliminates undigested residue and excess water and functions in the removal of bilirubin.

• **Skin:** Sweat glands excrete sweat. Sweating helps maintain body temperature and eliminates excess salts, water, and a small amount of urea.

• **Kidneys:** They clean the blood of toxic metabolic wastes and transform them into urine.

• **Urine pathway:** collecting duct → renal pyramids → renal pelvis → ureter → urinary bladder → urethra.

• **Glomerulus:** It is where filtration occurs in the nephron.

• **Loop of Henle:** It is involved in reabsorption of water, chlorides, and some ions.

• **Proximal convoluted tubule:** It is involved in reabsorption of amino acids, glucose, and salts.

• **Blood pathway:** aorta → renal artery → glomeruli → smaller veins/venules → renal vein → vena cava.

URINE FLOW

Kidney → ureter → bladder → urethra

3. MENDELIAN GENETICS

• **Gregor Johann Mendel:** He performed breeding experiments using garden pea plants (Pisum sativum).

• **Allele:** A form of a gene for a trait.

• **Genotype:** The genetic makeup of an organism, represented by letters.

• **Phenotype:** The physical trait or appearance shown by an organism.

• **Homozygous:** Having two identical alleles, such as AA or aa.

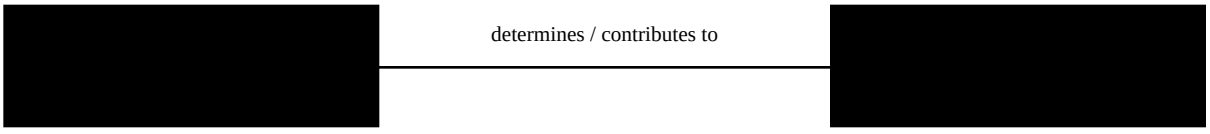
• **Heterozygous:** Having two different alleles, such as Aa.

• **Punnett square:** A chart used to predict trait inheritance.

• **Monohybrid example:** GG × gg produces 100% Gg offspring and 100% green phenotype when G is dominant.

• **Dihybrid example:** YYRR × yyrr produces YyRr offspring.

• **FOIL for YyRr:** The possible gametes are YR, Yr, yR, and yr.



KEY: AA = homozygous • Aa = heterozygous • aa = homozygous

4. VITAMINS & MINERALS — QUICK MATCH

Term	Remember
Vitamin C	needed to form collagen
Calcium	needed for strong bones and teeth
Iron	needed to make hemoglobin
Iodine	needed to make thyroid hormone
Vitamin A, D, K	Review the specific functions discussed in class; the exam source emphasizes matching the vitamin to its correct role.

5. HIGH-YIELD MEMORY MAP

★ **Digestive:** Mouth → Esophagus → Stomach → Small intestine → Large intestine

★ **Small intestine:** D-J-I = Duodenum → Jejunum → Ileum

★ **Large intestine:** C-C-R-A = Cecum → Colon → Rectum → Anal canal

★ **Urine:** Kidney → Ureter → Bladder → Urethra

★ **Nephron:** Glomerulus = filtration; Loop of Henle = reabsorption; PCT = reabsorption; Collecting duct = urine passes through

★ **Genetics:** Allele = form of gene; Genotype = letters; Phenotype = appearance; Homozygous = same; Heterozygous = different

★ **FOIL:** YyRr → YR, Yr, yR, yr

6. SELF-CHECK BEFORE THE EXAM

■ Can I explain the difference between **genotype** and **phenotype**?

■ Can I identify whether a genotype is **homozygous** or **heterozygous**?

■ Can I produce the four gametes from **YyRr**?

■ Can I arrange the **small intestine** and **large intestine** in order?

■ Can I distinguish the **ureter** from the **urethra**?

■ Can I identify the nephron structure responsible for **filtration**?

■ Can I match the major excretory organs with their waste products?

Exam Tip: When a question asks for a sequence, draw arrows. When it gives a genotype, identify the letters first before deciding the phenotype.