

YISHUN SECONDARY SCHOOL
 Subject & Code: Science (Biology) 5088
 Level & Stream: Sec 3E (Express)

The Curriculum and Approaches to Learning		Key Programmes / Competitions
To cultivate the joy of learning Science by developing students' knowledge, skills and attitudes in scientific-thinking through a well-designed curriculum that focuses on scientific inquiry and authentic learning. To prepare students for a life-long passion in learning Science and enable them to innovate and contribute to a technologically-driven society.		<p>Selected school competitions and enrichment programmes.</p> <p>All class structured group work develops communication competency.</p> <p>All data based and planning questions develop adaptive thinking competency.</p>
Term / Week	Learning Experiences (Chapter, Practical, Activity)	Learning Outcomes & Assessment
1/ 2-3	Chapter 1: Cell Structure and Organisation [Wk 3: Cells Practical]	W0: back to school program W4: 28 Jan (CNY celebration) W4: 29-30 Jan (CNY)
1/ 4-6	Chapter 2: Movement of Substances [Wk 6: Osmosis in potato cells Practical]	<p>WA1 (W7): Ch 1-2 3B31 - Day 4 3B36/7 - Day 3</p> <p>*Adaptive Thinking competency</p>
1/ 7-8	Chapter 3: Biological Molecules [Wk 9: Food test Practical]	
1/ 9-10	Chapter 4: Enzymes <u>March Holiday HW</u> Medical Case Studies SLS Package for Chapter 5 (Nutrition in Humans) *	
2/ 1-4	[Wk 1: Enzymes temperature Practical] Chapter 5: Nutrition in Humans	
2/ 5-8	Chapter 6: Transport in Humans	W2: 31 Mar (Hari Raya Puasa) W2: 4 Apr (Speech Day + SLI) W4: 18 Apr (Good Friday) W6: 1 May (Labour Day) W8: Student Learning Fest W8: 12 May (Vesak Day) W9: 23 May (YSS X-country) W10: MTL Intensive (Sec 4E5N only)
2/ 9	Chapter 7: Respiration in Humans <u>June Holiday HW</u> Chapter 8: Infectious Diseases in Humans (SLS Lesson Packages)	WA2 (W7): Ch 2-4
3/ 1-4	Chapter 7: Respiration in Humans	W2: 7 July (Youth Day) W4: 21 July (Racial Harmony Day)
3/ 5-7	Chapter 8: Infectious Diseases in Humans	W6: 8 Aug (ND celebration) W7: 11 Aug (National Day)
3/ 8-9	Chapter 9: Nutrition and Transport in Plants	W10: 4 Sep (TD celebration)

		W10: 5 Sep (Teachers' Day) WA3 (W6): Ch 5-7
4/ 1-2	Revision for EOY	W6: 20 Oct (Deepavali)
4/ 3	EOY Exams begin	EOY Exam: Ch 1 to 8

Fostering Adaptive Thinking

Through Chapter 4: Enzymes & Chapter 5: Nutrition in Humans [Medical case studies]

(1) Purpose

The purpose of this inquiry-based activity is to develop students' understanding of human nutrition and digestion through real-world, case-based scenarios. By adopting the role of medical professionals, students apply theoretical knowledge of organ functions and processes within the alimentary canal and accessory organs to diagnose and discuss medical cases. This hands-on approach fosters critical and adaptive thinking as students analyze symptoms, connect physiological functions, and collaboratively devise solutions, helping them understand the relevance of nutrition and digestion in health contexts. Students are also required to think critically and creatively to propose adapted drug designs to allow for efficient and effective delivery of enzymes to a particular organ in the alimentary canal. The novel context of design thinking encourages students to problem-solve and integrate disciplinary knowledge and skills.

(2) Process

Students work in assigned teams, each analyzing a series of medical case studies detailing various digestive conditions. Students will also need to sketch their drug design and suggest how specific features of the drug tolerates the acidic nature of the stomach and allows for enzymes act only in the small intestine. They'll use a booklet to document findings and insights during team and class discussions. Teachers guide students on when to share responses on digital devices for collaborative analysis. Through collaborative problem-solving and structured reflections, students continuously refine their diagnostic skills, apply biological concepts in practical situations, and strengthen peer communication, preparing them to think adaptively in diverse contexts.

(3) Impact on Students' Learning

This activity enhances students' adaptive thinking by engaging them in authentic, problem-based learning. They gain a deeper understanding of the human digestive system's role in overall health and how disruptions can lead to medical conditions. Working as part of a "medical team" strengthens their analytical and teamwork skills, preparing them for real-world collaborative problem-solving. By diagnosing and reasoning through case studies, students internalize biological concepts, improving retention and fostering curiosity about physiological systems in human health.