YISHUN SECONDARY SCHOOL
Subject & Code: Science (Biology) (5107)
Level & Stream: Sec 3 (Normal Academic)

<table>
<tr><th colspan="2">The Curriculum and Approaches to Learning</th><th>Key Programmes / Competitions</th></tr>
<tr><td colspan="2">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.</td><td>Selected school competitions and enrichment programmes.

All class structured group work develops communication competency.

All data based and planning questions develop adaptive thinking competency.</td></tr>
<tr><th>Term / Week</th><th>Learning Experiences (Chapter, Practical, Activity)</th><th>Assessment & Events</th></tr>
<tr><td>1/2-4

1/5-7

1/8-10</td><td>Chapter 1: Cell Structure and Organisation + Lab safety briefing

Chapter 2: Movement of Substances

Chapter 3: Biological Molecules

March Holidays HW: Revision for Chapter 1 and 2</td><td>W0: back to school program
W4: 29-30 Jan (CNY)

W9: WA1 - Chapters 1 and 2
3B21/2 - Day 4
3B26 - Day 3</td></tr>
<tr><td>2/1-2

2/3-6

2/7-10</td><td>Chapter 3: Biological Molecules

Chapter 4: Enzymes

Chapter 5: Nutrition in Humans

June Holidays HW: Medical case studies for Chapter 4 (Enzymes) & Chapter 5 (Nutrition in Humans)*</td><td>W2: 31 Mar (Hari Raya Puasa)
W4: 18 Apr (Good Friday)
W6: 1 May (Labour Day)
W8: Student Learning Fest
W8: 12 May (Vesak Day)
W10: MTL Intensive (Sec 4E5N only)

*Adaptive Thinking competency

W7: WA2 – Chapters 2, 3 and 4</td></tr>
<tr><td>3/1-4

3/5-9

3/10</td><td>Chapter 6: Transport in Humans

Chapter 7: Respiration in Humans

Revision for EOY</td><td>W2: 7 July (Youth Day)
W6: 8 Aug (ND celebration)
W7: 11 Aug (ND School Hol)
W10: 4 Sep (Teachers' Day Celebration)
W10: 5 Sep (Teachers' Day)

W9: WA3 - Chapter 4, 5 and 6</td></tr>
<tr><td>4/1-2</td><td>Revision for EOY</td><td>EOY - Chapter 1 to 7</td></tr>
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4/3	EOY exam starts	

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.