The Sciences

Biology, Chemistry, Physics

Mr See Boon Tiam
Dean, Biology

Mr Dennis Sim
Dean, Chemistry

Ms Colleen Ng
Dean, Physics

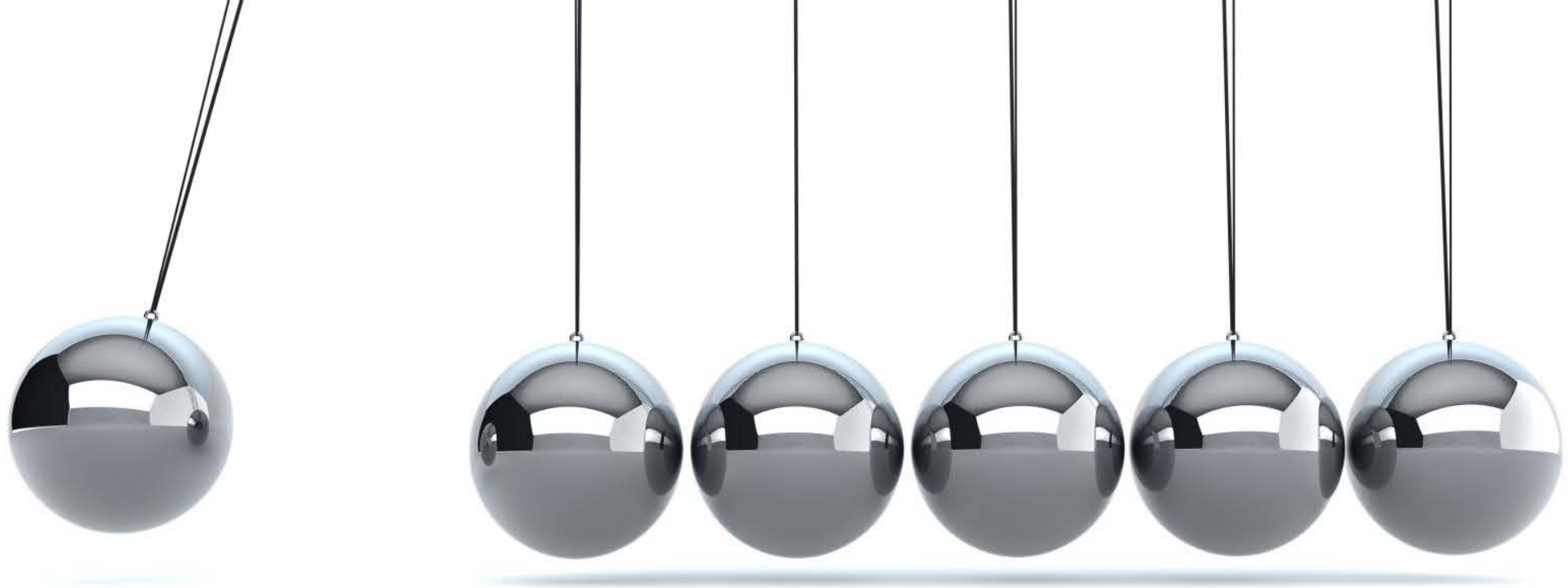
Vision of science education

- Students are inspired by Science
  - Enjoy learning
  - Fascination
  - Relevant and meaningful
- Students inquire like scientists
  - Strong foundation
  - Spirit of scientific inquiry
- Students innovate
  - Generate creative solutions
  - Solve real-world problems

Cultivating Values, Ethics and Attitudes

- Appreciate the values and ethical implications of the application of science in society.

- Ability to articulate their ethical stance in issues that involve ethical dilemmas.

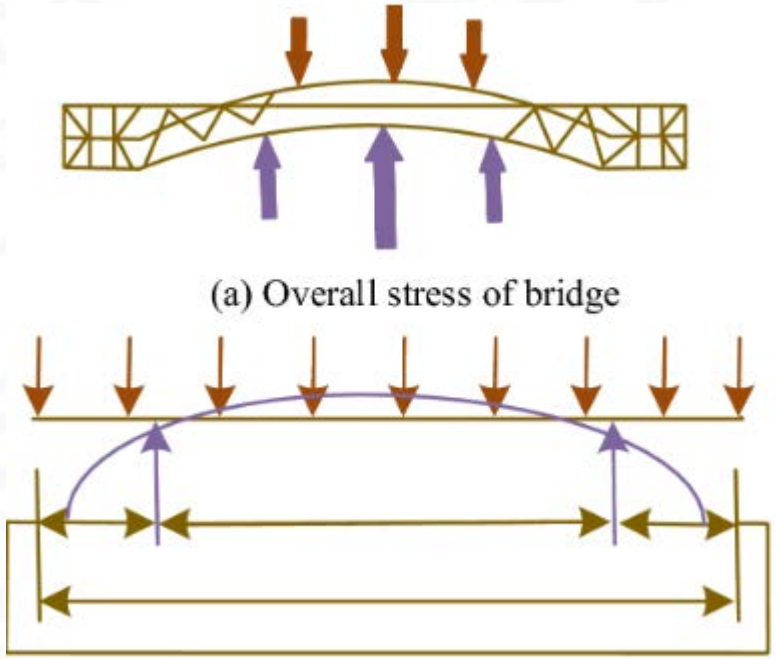


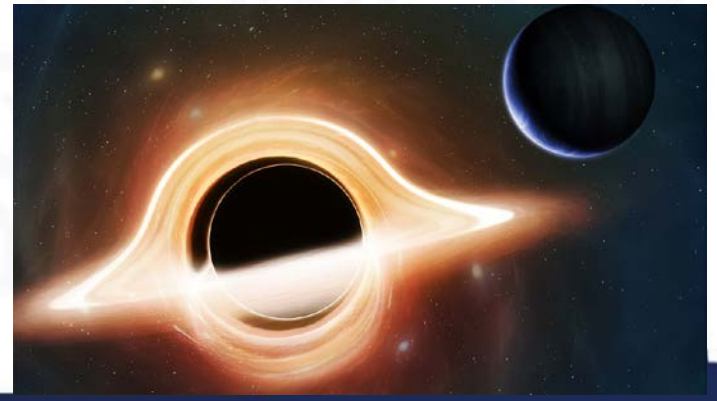
Physics (Syllabus 6091)

Physics

The aim of physics is to study nature at its most fundamental level – to discover and apply the general laws that govern force and motion, matter and energy, space and time.

Physics can be as concrete as the stresses in a bridge or as abstract as the curved space-time near a black hole.





Physics

Why study Physics?

- **Appreciate** practical applications of **Physics** in the real world
- Deepening their **interest** in Physics for **innovations** and seizing new opportunities in the future
- **Approach**, **Analyse** and **Solve problems** in the physical world

Physics

Content of the Physics course

1. Matter and energy make up the Universe
2. Matter interacts through forces and fields
3. Forces help us understand motion
4. Waves can transfer energy without transferring matter
5. Conservation laws constrain the changes in systems
6. Microscopic models can explain macroscopic phenomena

Chemistry (Syllabus 6092)

Chemistry

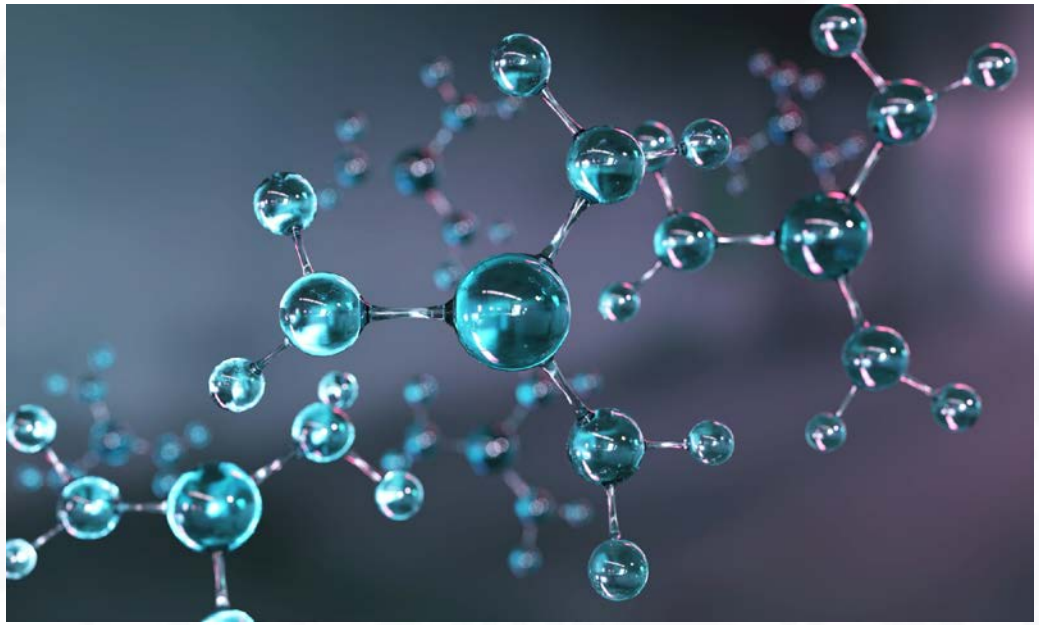
Introduction to the Chemistry course

- Less emphasis on factual materials.
- Greater emphasis on the **understanding and application** of scientific concepts and principles.
- **Develop skills** of long-term value in an increasing complex and globalized world.

Chemistry

Why study Chemistry?

- **Appreciate** the practical applications of Chemistry in the **real world**.
- **Develop a way of thinking** by approaching, analyzing and solving problems by explaining macroscopic characteristics through use of microscopic representations.
- **Develop healthy** values, ethics and attitudes relevant to Science.



Chemistry

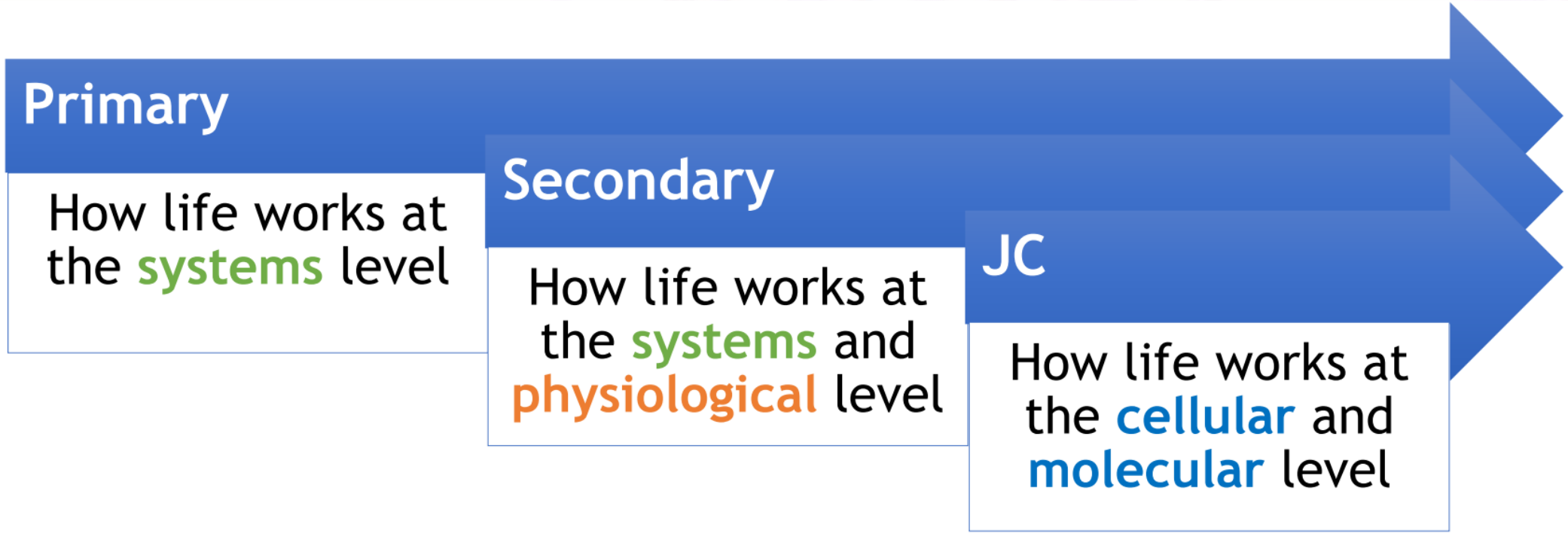
Content of the Chemistry course

Broadly divided into 3 sections

- Matter – Structure and Properties
- Chemical Reactions
- Chemistry in a Sustainable World

Biology (Syllabus 6093)

Biology



Biology is the study of life. In general, biologists study the structure, function, growth, origin, evolution, and distribution of living organisms.

Biology

Why study Biology?

- **Appreciate** the practical applications of Biology in the **real world**.
- Developing skills and interests in areas of **sustainability** for future learning and work
- Understand how living organisms work to **sustain life**.

Biology

Content of the Biology course

1. From **Cells to Structure** and **Functions**.
2. Interactions of **Biological system** within organism and the environment resulting in the flow of energy and nutrients
3. **Continuity of life** from genes to evolution

Assessment

Paper	Duration	Marks	Weighting	Remarks
1	1 hr	40	**30%**	40 compulsory MCQ
2	1 hr 45 min	80	**50%**	Structured and free-response
3	1 hr 50 min	40	**20%**	A series of laboratory tasks testing various skill sets

Internal Assessment at Y3 and Y4

Year 3

Weighted Assessment	30%
Year-end examination	70%
Total	100%

Year 4

Modular Assessments/Common tests	0%
Mid-year practical assessment	0%
Prelim examination	100%

Subject prerequisites and triple science combination

- Strong performance in Secondary 2 Mathematics and Sciences is required to take and handle all 3 Sciences

- Content heavy (time consuming)

- Increased requirement for analytical thinking based upon given contexts

Future Prospects

- Prerequisite for respective A-level subjects at H1 and H2 levels (Please refer to respective pre-university educational institute's website)

- Reading Medicine/Dentistry at local university:
  - Chemistry is compulsory with another Science
    - https://www.nus.edu.sg/oam/docs/default-source/admissions/h1-h2-sdp.pdf
    - https://nus.edu.sg/oam/docs/default-source/default-document-library/ibdp-sp.pdf
    - https://www.ntu.edu.sg/medicine/education/bachelor-of-medicine-and-bachelor-of-surgery-(mbbs)/entry-requirements

National University of Singapore

Single Degree Programmes	Subject Requirements
Dentistry	H2 pass in Chemistry and either Biology or Physics
Food Science and Technology	H2 pass in any two of the following: Chemistry, Biology, Physics, Computing, Mathematics or Further Mathematics
Medicine	H2 pass in Chemistry and either Biology or Physics
Pharmacy	Very good pass in H2 Chemistry and very good pass in H2 Biology, Physics, Mathematics or Further Mathematics
Pharmaceutical Science	Very good pass in H2 Chemistry and very good pass in H2 Biology, Physics, Mathematics or Further Mathematics

LKCMedicine MBBS programme

Qualifications	Requirements
Singapore-Cambridge GCE A-Level Certification	• H2 Pass in Chemistry and H2 Pass in either Biology or Physics. • All H2 subjects and attempted General Paper (GP) or Knowledge & Inquiry (KI) must be taken at one sitting. • Meet Mother Tongue Language (MTL) requirement. • More details can be found here.
International Baccalaureate Diploma	• Pass in HL Chemistry and Pass in either HL Biology or Physics. • Meet Mother Tongue requirement. • More details can be found here.

Science Syllabuses

http://www.seab.gov.sg/

Physics (6091)

Chemistry (6092)

Biology (6093)

Thank you !