

2 June 2020



The Principal
All Primary Schools
Attn. Science / Maths HODs / Co-ordinators

Dear Sir / Mdm

SPECIAL SCIENCE PROGRAMMES IN YOUR SCHOOL AND ONLINE AVAILABLE NOW

Thank you for your continuous support of our programmes over the years. Science Centre Singapore will like to offer programmes to be held either in your school or online during this post-Circuit Breaker period. There are also options for home-based learning programmes. These programmes are specially curated to be concise and relevant to syllabus.

We are offering 4 different modes of facilitation, (1) on-site in school, (2) online in school, (3) live home-based learning or (4) pre-recorded home-based learning workshops, subject to availability. Attached herewith is more information about the programmes offered and the possible modes of facilitation. Should you be interested, please scan the QR codes for programme booking.

We do encourage you to take up our programmes as they are only offered during this period at a special rate. For any enquiries or clarifications for the workshops, please contact the following managers:

<p>For DNA programmes Ms Charissa 6425 2789 Charissa_Lin@science.edu.sg</p>	<p>For Nature Science programmes Dr Sharma 6425 2517 Savita_Sharma@science.edu.sg</p>	<p>For Physical Sciences programmes Ms Doris 6425 2592 Doris_Chow@science.edu.sg</p>
 https://tinyurl.com/postcb-dna-pri	 https://tinyurl.com/postcb-ns	 https://tinyurl.com/postcb-ps

Scan QR codes to book programmes

Thank you very much for your support and we look forward to meeting you and your students in school or online.

Yours sincerely,



Anne Dhanaraj (Mrs)
Senior Director, Education Programmes
Science Centre Singapore

Special Science Programmes for Primary Schools

Please note that

- These programmes have been modified from their namesakes conducted onsite in Science Centre.
- Modifications to the programme duration can be done with special request.
- Multiple sessions of the same programme can be done either concurrently or at separate timings within the same day.
- Programmes have been tailored to exclude group work. Sufficient materials will be catered for all participants, unless otherwise stated.
- Programme items will be sanitised after every use.
- These programmes may be conducted in 4 different ways:
 - A: On-site in school: held in individual classrooms/ Science laboratories
 - B: Online in school: conducted live by an educator, with materials sent to school
 - C: Live home-based learning: conducted live by an educator during HBL week, with materials sent to school in advance
 - D: Pre-recorded home-based learning: Pre-recorded instructions and demonstrations will be sent to school in advance, together with materials for hands-on activities

Please see the table below for more information about each of the mode of delivery.

The workshops can be conducted in the following ways:

Mode of delivery	Option A: On-site in school	Option B: Online in school	Option C: Live home-based learning	Option D: Pre-recorded home-based learning
Venue where workshop is conducted	In school	In school	At home	At home
Will there be an educator?	Yes, physically in your school.	Yes. Educator will interact with the students in the class through a livestream online session using Zoom.	Yes. Educator will interact with the students in the class through a livestream online session using Zoom.	Pre-recorded videos of the educator and experiment demonstrations
Will materials for hands-on activities be provided?	Yes	Depends on workshop. For workshops with materials, materials will be sent to school in advance.	Depends on workshop. For workshops with materials, materials will be sent to school in advance.	Yes, the materials will be safe for students to do independently at home. For workshops with materials, materials will be sent to school in advance.
Minimum Capacity	Minimum capacity of 60 students per day. However, these are not mass-based activities. The workshops will be conducted either concurrently or at different timings on the same day for each class.	Minimum capacity of 20 students per class.	Minimum capacity of 20 students per class.	Minimum capacity of 20 students per class.
Other things to take note	Please factor in additional 15min before the workshop start time and in between consecutive classes for set-up.	Please factor in additional 15min before the workshop start time for technical set-up.	Please factor in additional 15min before the workshop start time for technical set-up.	A pre-recorded video of the workshop and other resources will be provided to the teacher in advance to upload to school's Student Learning Space.

Mode of delivery	Option A: • On-site in school	Option B: • Online in school	Option C: • Live home-based learning	Option D: • Pre-recorded home-based learning
DNA programmes offered  https://tinyurl.com/postcb-dna-pri	<ul style="list-style-type: none"> • DNA Basics (P5-P6) • Genes and Our Traits (P5-P6) • Bacteria Outbreak! (P5-P6) • The Puzzling Case of Professor X (P5-P6) 	<ul style="list-style-type: none"> • DNA Basics (P5-P6) • Genes and Our Traits (P5-P6) • Bacteria Outbreak! (P5-P6) • The Puzzling Case of Professor X (P5-P6) 	<ul style="list-style-type: none"> • DNA Basics (P5-P6) 	<ul style="list-style-type: none"> • DNA Basics (P5-P6)
Nature Science programmes offered  https://tinyurl.com/postcb-ns	<ul style="list-style-type: none"> • A Butterfly is Born (P1-P2) • The Enormous Watermelon (P1-P2) • Insect Mysteries (P3-P4) • The Magnificent World of Plants (P4-P6) • How Fruits and Seeds are Scattered (P4-P6) • Climate Change and Sustainability (P5-P6) 	<ul style="list-style-type: none"> • A Butterfly is Born (P1-P2) • The Enormous Watermelon (P1-P2) • Insect Mysteries (P3-P4) • The Magnificent World of Plants (P4-P6) • How Fruits and Seeds are Scattered (P4-P6) • Climate Change and Sustainability (P5-P6) 		
Physical Science programmes offered  https://tinyurl.com/postcb-ps	<ul style="list-style-type: none"> • Magnets (P3-P4) • Heat and Temperature (P4-P6) • Pandemic Crisis (P4-P6) • Wind Turbine (P4-P6) • Electric Carnival (P5-P6) 	<ul style="list-style-type: none"> • Pandemic Crisis (P4-P6) 	<ul style="list-style-type: none"> • Pandemic Crisis (P4-P6) 	

Scan QR codes to book programmes

A. DNA Programmes

1. DNA Basics

<i>Levels: Pri 5-6</i>	<i>Duration: 1 hour</i>	<i>Cost: \$8/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i> <i>C: Live home-based learning</i> <i>D: Pre-recorded home based learning</i>		

Ever seen how DNA looks like? Why is DNA so important? Be a DNA scientist for the day and join us in this introductory lesson to learn the basics of DNA. See what DNA looks like in real life and make a 3D DNA model to bring home!

Learning Objectives:

- Understand the role of DNA in our lives.
- Learn about the DNA structure and make a DNA model.
- Conduct a simple DNA extraction from wheat germ independently*

**Only available for delivery option A and B. For home-based learning, this will be done as a demonstration.*

2. Genes and Our Traits

<i>Levels: Pri 5-6</i>	<i>Duration: 1.5 hour</i>	<i>Cost: \$8/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i>		

Have you ever wondered why you look like your parents? Eye colour, gender and free or attached earlobes are examples of physical traits that are determined by our genes. How is it possible that one sibling has brown eyes, while the other sibling has blue eyes? To find out about this and more, join us as we observe our physical traits and learn how we inherit them from our parents!

Learning Objectives:

- Understand what physical traits are and how to identify them.
- Understand the diversity of genetic traits and that every individual has different genetic makeup.
- Conduct a simple DNA extraction from wheat germ independently.
- Learn about sex chromosomes and how it determines the gender of a baby.
- Understand that some traits are determined by a combination of genes from the father and mother.
- Learn how DNA can give rise to traits that affect an individual's survival.

3. Bacteria Outbreak! [No real bacteria will be used]

<i>Levels: Pri 5-6</i>	<i>Duration: 1.5 hour</i>	<i>Cost: \$8/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i>		

An outbreak has occurred and patients have been sent to the hospital with common symptoms and diarrhoea. Join us as we take on the role of an epidemiologist to identify the cause of the outbreak and the source. Can we stop the spread of the outbreak? The case study will be based on a food poisoning outbreak but will draw links to how the current COVID-19 outbreak is handled.

Learning Objectives:

- Understand what outbreaks are.
- Learn the basic steps taken to investigate an outbreak.
- Understand the possible causes of food poisoning outbreaks and how to prevent them through proper hygiene.
- Learn the basic techniques of growing bacteria.
- Understand the differences between bacteria and virus and identify the basic shapes of bacteria.

4. The Puzzling Case of Professor X

<i>Levels: Pri 5-6</i>	<i>Duration: 1.5 hour</i>	<i>Cost: \$15/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i>		

Professor X has been found dead! A suicide, an accident, possibly foul play? As the detective working on the case, something tells you things are not as simple as they seem. Will the clues reveal something even more sinister...? It is up to you to uncover the truth!

Learning objectives:

- Understand different forensic techniques.
- Identify types of fingerprints.
- Learn about blood patterns and blood pattern analysis.
- Roleplay interrogation techniques.

B. Nature Science Programmes

5. A Butterfly is Born

<i>Levels: Pri 1-2</i>	<i>Duration: 1 hour</i>	<i>Cost: \$8/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i>		

In conjunction with the book, A Butterfly is Born, students will learn about the different types of insects and their characteristics. Live insects and insect specimens will be shown during the workshop. Students will also learn about the different life cycles of insects and make their very own butterfly life cycle.

Topics covered:

- Characteristics of an insect
- Parts of a butterfly
- Life cycles of insects
- Create a butterfly life cycle craft

6. The Enormous Watermelon

<i>Levels: Pri 1-2</i>	<i>Duration: 1 hour</i>	<i>Cost: \$8/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i>		

In conjunction with the book, The Enormous Watermelon, students will learn about plants in an exciting way. Through fun and engaging hands-on activities, students will get a chance to learn the function of various plant parts. After learning more about the life cycle of a plant, students will get a chance to create their own art and craft activity of a plant, as well as, to grow their own plant afterwards.

Topics covered:

- Identify the functions of different parts of the plants
- Life cycle of a plant
- Create a plant craft
- Grow-it-yourself plant (post-workshop activity)

7. Insect Mysteries

<i>Levels: Pri 3-4</i>	<i>Duration: 1.5 hour</i>	<i>Cost: \$8/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i>		

Insects are the most diverse group of organisms on Earth and are vital to the health of our environment. Discover the many unique and different characteristics and adaptations of insects and learn about their life cycles. Not forgetting to get close and personal with some creepy crawlies and even observe them under the microscope!

Topics covered:

- Characteristics of an insect
- Life cycles
- Adaptations of insects to their environment

8. The Magnificent World of Plants

<i>Levels: Pri 4-6</i>	<i>Duration: 1.5 hour</i>	<i>Cost: \$8/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i>		

What are the different parts of a plant? What is the function of each part? What are the differences between plants and fungi? In this virtual workshop, dive into the magnificent world of plants through microscopic views of various plant parts, hands-on demos, and viewing of various specimens. Hop onto a Virtual Nature Trail at our Eco Garden to identify some plants, and explore their characteristics”

Topics covered:

- Plant parts and their functions
- Plants and fungi
- Flowering and non-flowering plants
- Characteristics of plants (via Virtual Nature Trail)

9. How Fruits and Seeds are Scattered

<i>Levels: Pri 4-6</i>	<i>Duration: 1hour</i>	<i>Cost: \$8/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i>		

Through observing various fruit and seed specimens, find out how they are adapted for dispersal. In the process, students will be taught how to classify them into various methods of dispersal, such as by water, wind, explosive action and animals.

Topics covered:

- Reproduction
- Life cycles in flowering plants
- Recognise the four different modes of seed dispersal

10. Climate Change and Sustainability

<i>Levels: Pri 5-6</i>	<i>Duration: 1hour</i>	<i>Cost: \$8/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i> <i>B: Online in school</i>		

How will the Earth look like in the future? What can we do to mitigate climate change and pollution? In this workshop, you will be taking a closer look at how climate change and global warming affect the environment and living things, as well as the problem of plastic pollution. By understanding these real-world issues, we can actively make changes to our lifestyle to protect our Mother Earth.

Topics covered:

- Effects of global warming and rise in sea level
- Ocean acidification
- Plastic pollution
- Identification of microplastics

Complimentary workshop

Sponsored by Temasek Foundation, Science Centre Singapore will conduct this Climate Change and Sustainability workshop at no charge for schools who enrol at least 200 students for the complimentary 'I am a Young Sustainability Champion' programme. The free workshops are only valid for sessions held between 1 July and 31 August 2020, on a first come first serve basis. Students will learn about Sustainable Development Goals and achieve 3 trophies for Project #19 (out of 15 for the programme) after this class.

Teachers who want the complimentary workshops will need to submit your details and name list at <https://tinyurl.com/sustainabilitychampion> at least 10 working days before workshop.



C. Physical Sciences Programme

11. Wind Turbine

<i>Levels: Pri 4-6</i>	<i>Duration: 1 hour</i>	<i>Cost: \$15/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i>		

Students will get to make a pinwheel to attach to a motor, and if it is efficient in collecting wind, the LED attached to the motor will be able to light up. Students are also encouraged to try other designs with the motors and make their LED light up as steadily as possible.

Topics covered:

- Renewable energy
- Energy conversion

Complimentary class

Sponsored by Temasek Foundation, Science Centre Singapore will conduct this Wind Turbine workshop at no charge for schools who enrol at least 200 students for the complimentary 'I am a Young Sustainability Champion' programme. The free classes are only valid for sessions held between 1 July and 31 August 2020, on a first-come-first-serve basis. Students will learn about Sustainable Development Goal #7 (Ensure access to affordable, reliable, sustainable and modern energy for all) and achieve 1 trophy for Project #2 (out of 15 for the programme) after this class.

Teachers who would like to book for the complimentary classes will need to submit your details and name list at <https://tinyurl.com/sustainabilitychampion> at least 10 working days before workshop.



12. Magnets

<i>Levels: Pri 3-4</i>	<i>Duration: 1.5 hours</i>	<i>Cost: \$15/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i>		

Explore the exciting phenomena of magnetism through different types and shapes of magnets. You can investigate the magnetic properties of materials, make your own magnets, find out the properties and uses of different magnets, and even see the patterns of a magnetic field!

Topics covered:

- Identify the characteristics of magnets
- List some uses of magnets in everyday objects
- Make a magnet by the 'stroke' method and electrical method

13. Electric Carnival

<i>Levels: Pri 5-6</i>	<i>Duration: 1.5 hours</i>	<i>Cost: \$15/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i>		

We know that electricity is important, but how much do we really know about it? Through experimentation and hands-on activities, explore concepts such as parallel and series circuits, electrical connections, conductors, and insulators. Find out how common electrical components like fuses and LEDs work, and how these are important in our daily lives.

Topics covered:

- Identify electrical conductors and insulators
- Construct simple circuits from circuit diagrams
- Investigate the effect of some variables on the current in a circuit

14. Heat & Temperature *[To be conducted in Science Lab if possible]*

<i>Levels: Pri 4-6</i>	<i>Duration: 1.5 hours</i>	<i>Cost: \$15/ participant</i>
<i>Available mode of delivery:</i> <i>A: On-site in school</i>		

In this workshop, students will carry out a series of hands-on activities to enhance their learning on heat gain or loss by an object. By applying the concepts on heat energy and temperature changes, students will work in groups to tackle the design challenge using different materials and ways to reduce heat gain (i.e. keep something cool longer).

Topics covered:

- Differentiate between heat and temperature
- Relate the change in temperature of an object to the gain or loss of heat
- Investigate the effect of conductors and insulators

15. Pandemic Crisis! [only available from 1 July 2020 onwards]

Levels: Pri 4-6	Duration: 1 hour	Cost: \$8 or \$15/ participant
<p>Available mode of delivery:</p> <p>A: On-site in school (\$15/ participant)</p> <p>B: Online in school* (\$8/ participant)</p> <p>C: Live home-based learning* (\$8/ participant)</p> <p>* There will not be any materials (e.g. worksheets) sent to the school/students. Each student will need a mobile device (tablet/laptop) for student engagement.</p>		

The Science Educator uses storytelling and roleplay to get students to think about the consequences of decision making based on our current situation. Each student is a District Minister for Beautopia trying to contain the twin crisis of both climate change and pandemic. The decision you make individually, and as a team, will decide the future of your city, what will history say about you?

Learning objectives:

- Responsible decision making for sustainable living and social awareness
- Multi-disciplinary approach for logical thinking, creative problem solving and strategy planning

Complimentary facilitation

Sponsored by Temasek Foundation, Science Centre Singapore will conduct a live facilitation by our Science Educator at no charge for schools who enrol at least 200 students for the complimentary 'I am a Young Sustainability Champion' programme. The free online facilitations are only valid for sessions held between 1 July and 31 August 2020, on a first-come-first-serve basis. Students will learn about Sustainable Development Goals and achieve 2 trophies for Project #13 (out of 15 for the programme) after this class.

Teachers who would like to book for the complimentary classes will need to submit your details and name list at <https://tinyurl.com/sustainabilitychampion> at least 10 working days before workshop.

