

STEAM

Science, Technology, Engineering, Arts, Mathematics

Matters

STEAM is an interdisciplinary approach that integrates

Science, Technology, Engineering, Arts, and Mathematics.

STEAM pervades every aspect of our lives. By exposing students to STEAM and giving them opportunities to explore STEAM-related concepts, we hope that learners are able to integrate these disciplines into a cohesive learning paradigm, and explore how these concepts are applicable in the real-world.

STEAM Matters aims to foster partnerships between educators, parents and learners in developing 21st century skills. STEAM Matters has been specially designed to stimulate creative and critical thinking skills, expose learners to real-world application, and to instil FUN! Each issue is packed with a broad variety of topics, striking images and stories, as well as interactive activities and quizzes!



Making STEAM come alive through PLAY

For more details, please e-mail contact@cpdsingapore.com

What's Inside?

Broad Variety of Topics

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STEAM Integration into each Theme

Technology

Arts

Engineering

DIALING FOR CLEAN WATER



Have you ever wondered where you get drinking water? The water we drink comes from lakes, rivers, streams, glaciers and even from the ground. The water is taken from these places and treated, so that it will not make us sick when we use it. Let's take a look at how Singapore treats its water!

Source: Public Utilities Board (PUB)

- ### 3-Step Treatment


Coagulation: The first stage of the water treatment is known as coagulation (C₁). In this process, water is passed through a water treatment tank.
- ### 2 Reverse Osmosis:

The second stage of the water treatment is called Reverse Osmosis (RO). Here, the water from the first stage is passed through a semi-permeable membrane. Only pure molecules like water can pass through.
- ### 3 UV Disinfection:

In the last stage, ultraviolet light is used to ensure the purity of the water.

Science

Engineering




Have you ever heard of **recharged security alarm?**
Beats on its own when there is an intruder!
Beats on to find out more!

Learning Objective:

To understand that a current can only flow in a closed circuit.

In an electric circuit:

- When the switch is closed (ON position), the bulbs will **glow**.
- When the switch is opened (OFF position), the bulbs will **not light up**.



There can be different arrangements of batteries and light bulbs!

Learning Objective: To communicate the effect of variables on a circuit.

One battery that can be connected in series provides more electricity in a circuit compared to one battery. The light bulb will glow brighter in a series circuit.

However, when two batteries are connected in parallel, the electricity passing through the separate circuit are equal.

When two light bulbs are arranged in series, the amount of current passing through is different. The more the number of light bulbs in the circuit, the dimmer the light bulbs will be.

When two light bulbs are arranged in parallel, each bulb forms a separate path with its own battery. Hence, the bulbs glow equally bright.

Optimised design: is used by engineers to explore ideas and options. When they start to solve a problem, they first make a design that the best solution will be. Hence, ideas and options are always designed by engineers. It is important to help them explore and understand the underlying problem, evaluate design objectives, and to receive feedback from others. They will then select the best solution. The best solution can be based on:

- costs
- quality
- reliability
- ease of use
- aesthetics
- social impact

Now, it's time to put on your thinking cap and think like an engineer!

- ### SCENARIO 1:

Family A collects water through wells. They live in an area that has a high level of precipitation (rain and snow). However, the rain water has been contaminated by pollution. Design a system to help them get clean drinking water.
- ### SCENARIO 2:

Family B's water has been completely run dry! Design this family a system that will help them get their water supply once again.
- ### SCENARIO 3:

Family C lives high in the mountains. Due to climate change, nearby ice glaciers have been melting. Melted waters flow into nearby rivers but contaminated by pollution. Design a system to solve their problem.
- ### SCENARIO 4:

Family D lives in a region that has clean water sources nearby. However, there are just too many people living in the area. The water sources are not able to provide clean drinking water for everyone. They live near a suburban area. Design a system for the community that can help them provide enough clean drinking water for the community.

MAKE YOUR OWN FLASHLIGHT

Electrical engineers designed the wiring of an alarm system to be in series. The doors or windows are closed, when the windows and doors are closed, the alarm circuit is closed. However, when someone breaks open the door or window, the alarm circuit breaks open. The alarm the alarm to be triggered. (BBC)

- Describe the qualities of a good designer.
- What do you think are the parts of a flashlight? What are their functions?
- Draw a circuit diagram for your flashlight.
1. Draw the circuit diagram to make sure it is working. Use a battery, wire, a switch, a bulb, a key, a pencil, and an eraser to make a circuit.

2. Draw the circuit diagram to make sure it is working. Use a battery, wire, a switch, a bulb, a key, a pencil, and an eraser to make a circuit.

3. Draw the circuit diagram to make sure it is working. Use a battery, wire, a switch, a bulb, a key, a pencil, and an eraser to make a circuit.

4. Draw the circuit diagram to make sure it is working. Use a battery, wire, a switch, a bulb, a key, a pencil, and an eraser to make a circuit.

Hands-on Activities/ Quizzes/Puzzles/Jokes

Links to National Curriculum

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Words Matter!

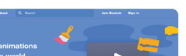
Stories Come Alive!

Learn to Code!


Learn to Code!

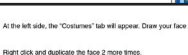
AM I HAPPY OR SAD?

- Visit <https://scratch.mit.edu>
- Start Coding!

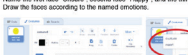


- Delete the cat and select paint.






- At the left side, the "Costumes" tab will appear. Draw your face without any emotions.
- Right click and duplicate the face 2 more times. Rename the first face "Crazy", second face "Happy", and the third face "Sad". Draw the faces according to the named emotions.



- Fill in the code according to the picture below



Create more emotions!

