

“Singapore – Maintaining a National Psyche of Water Scarcity”

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Singapore

- Located 1°N of the Equator
- An small island nation of 5.61 million people
- 719 sq km landmass
- No Natural Resources
- Water is the lifeblood of the country & its people
- According to the World Resources Institute, if things were left to nature, Singapore is the most water-stressed country in the world.



PUB Singapore

National Water Management
Agency

Manages Water Supply &
Drainage Systems in
Singapore

Public message of "Water for
All: Conserve, Value, Enjoy"



Our Water System

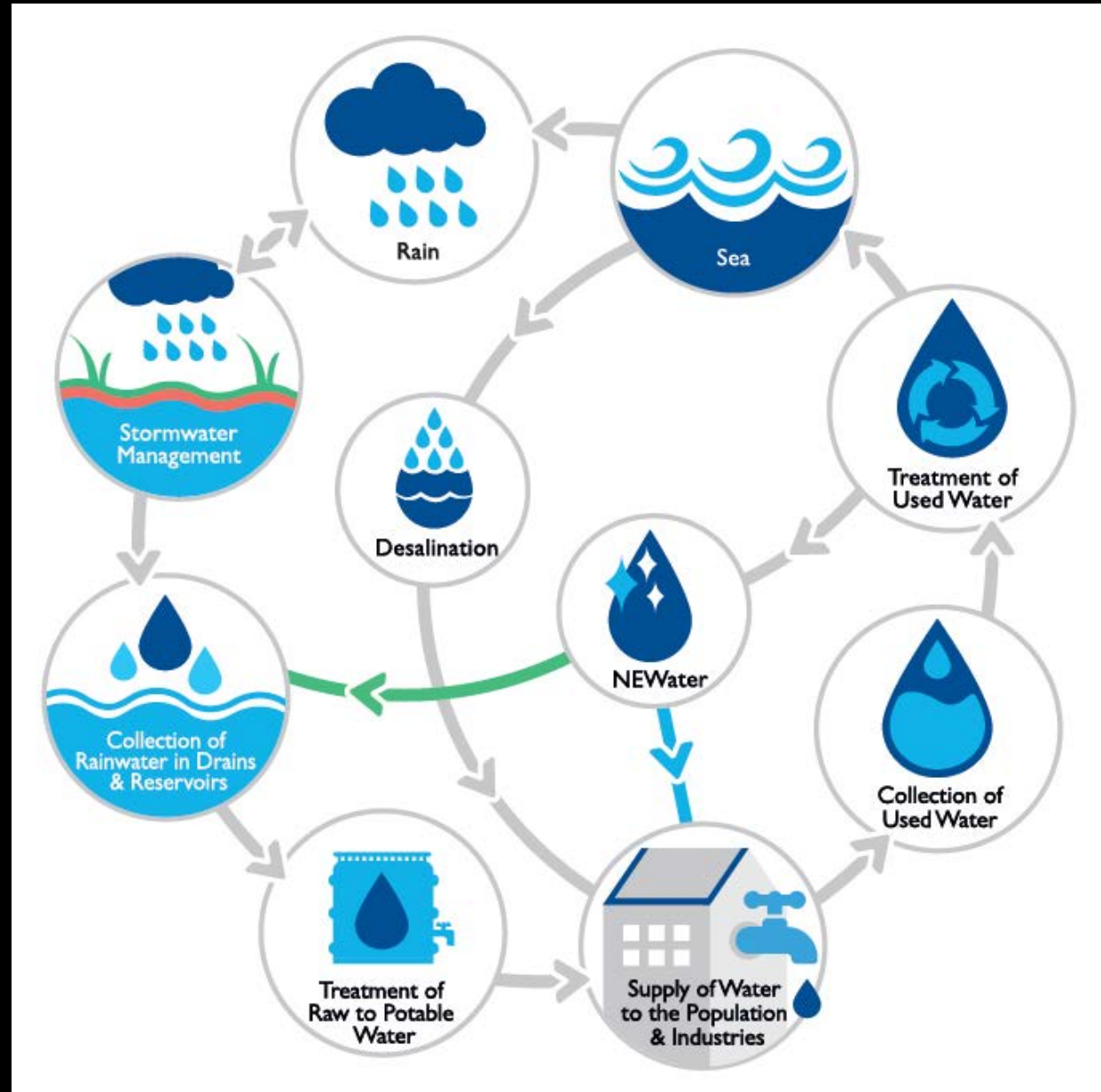
Singapore's 4 National taps:

- Local catchment,
- Imported Water,
- NEWater,
- Desalination



Singapore's Key Strategies for Water Management

- Collect every drop of water
- Reuse water endlessly
- Desalinate seawater



Marina Barrage

Marina Barrage officially opened on 31 Oct 2008.

Enable self-sufficiency in water supply





Active, Beautiful, Clean Waters (ABC Waters) Programme

Aim to transform Singapore into a City of Gardens and Water.

Vision of sparkling rivers and landscaped banks, kayakers paddling leisurely in the streams with clean waterways flowing into the picturesque lakes.

Strategic initiative to improve the quality of water and life by harnessing the full potential of our waterbodies.

Singapore has developed a pervasive network of 8,000km of waterways and 17 reservoirs for our water supply



Science Centre Singapore

Established in 1977 as one of the first Science Centre's in Asia

Comprises the Science Centre, Omni-Theatre & Snowcity

1.3 million visitors annually

250,000 students attending science enrichment classes annually



Science Centre's Programmes

Exhibitions

Science Enrichment Programmes

Festivals & Competitions

Publications



Enrichment programmes

Laboratory based

Students learn about water cycle in nature

Water pollution, testing water samples & water purification



Educational Tours to Facilities

Visits to NEWater Recycling Plant

Exhibition Gallery educates visitors on the process of water recycling

Bottled recycled NEWater for visitors to sample



Waterworks

An outdoor water play area

Features science facts & messages
to convey beauty of water



Water Ambassador Programme

Targetted at students

Projects & activities to create awareness & action

Students completing projects rewarded with badges

"I AM A YOUNG WATER AMBASSADOR"		Earn 20 Stars	Teacher's signature and date on completion of activity.
1	Describe the 4 stages in a water cycle.	★	
2	Visit the Marine Alcove at Science Centre and describe in details the characteristics of one of the sea creatures found there.	★	
3	Record and compare the temperature of a cup of ice with and without salt added to it.	★	
4	List 4 different ways to use water wisely at home.	★	
5	Write an article on whirlpool, observe the vortex at the Science Centre and state the forces that cause it.	★	
6	Cut out a snowflake using symmetry by folding the paper into a quarter.	★	
7	Design a poster to save water.	★★	
8	Put a long stick into a glass half filled with water. Observe the top view and side view of the glass and make a drawing of both views with descriptions. Notice the refraction of light.	★★	
9	Design an experiment to collect water droplets through transpiration from a potted-plant. List down the procedures and explain the results.	★★	
10	Construct a model of a water molecule and label the structure well.	★★	
11	What is water surface tension? Explain how small insects such as the pond skater can walk on water.	★★★	
12	Put a thin straw vertically into a glass of water. Make a drawing of the water level. Try using a thick straw (can use Bubble Tea straw) and make a drawing of the water level. Compare the differences between the two straws.	★★	
13	Why do ponds freeze from top to bottom instead of bottom up? Read up and make notes on the density of ice compared to water in liquid state.	★★★	
14	Design a simple experiment to find out what happens to the volume of water when it freezes.	★	
15	Visit your school pond or the pond at Eco-Garden at Science Centre. List 3 pond creatures and 3 plants living in a pond community and describe their characteristics.	★★★	
16	Write a short article on oceanography and hydrology.	★★★	
17	Visit the NEWater Visitor Centre at Koh Sek Lim Road (Nearest MRT Station: Tanah Merah) Tel: 65467874 / 65410511 email: pub_newatervc@pub.gov.sg . List the Four National Taps that work together to ensure a reliable and sustainable water supply to Singapore.	★★★★	
18	Find out the amount of water Singapore consumes in a year currently.	★★	
19	NEWater is the high-grade water produced after treated used water has been further purified. List the 3-step process involved.	★	
20	Who (minimum 3 person) and How have you spread the message of water conservation to.	★★	
21	Check if your home is water efficient and if not, list at least two ways of making it a water efficient home. If already water efficient, to provide details. Please refer to PUB website http://www.pub.gov.sg for more details.	★★	
Date Started : _____ Date completed: _____ Teacher's name (please print): _____ Name of Principal: _____ School stamp: _____ Tel: _____			Authorisation of award by the Singapore Science Centre Date awarded _____

Collaborations

With AMNH – a travelling exhibition on “Water H₂O=Life”

International partnership with 9 Science Centres & Museums as well as the PUB of Singapore

Features the science, culture & geology of water & its importance to life.

Exhibition with Singapore’s Water Story incorporated



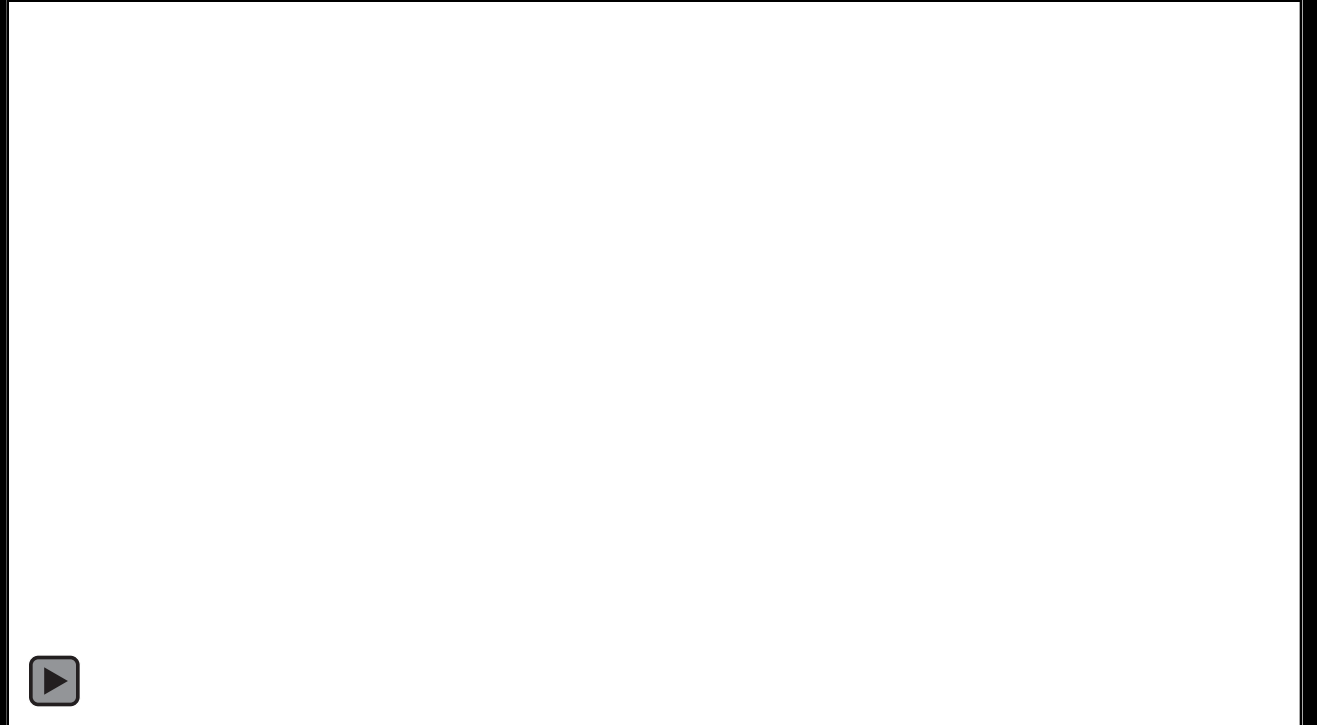
Science Centres Engagement and the Rio Summit (SCEnaRioS)

An initiative of ASTC, Science Centre Singapore together with Questacon in Australia and Guangdong Science Centre in Guanzhou, China collaborated in a project to engage youth with the topic of sustainability.

The group produced online resources that was shared worldwide and were featured at the Planet Under Pressure conference in London in the Rio+20 Earth Summit in 2012

The youth in Singapore researched on Singapore's 4 National Taps and surveyed Singaporeans' household water consumption habits and public attitudes to water conservation.

Major investigation into the acceptance by the public of the introduction of reclaimed water into Singapore's drinking water supplies.



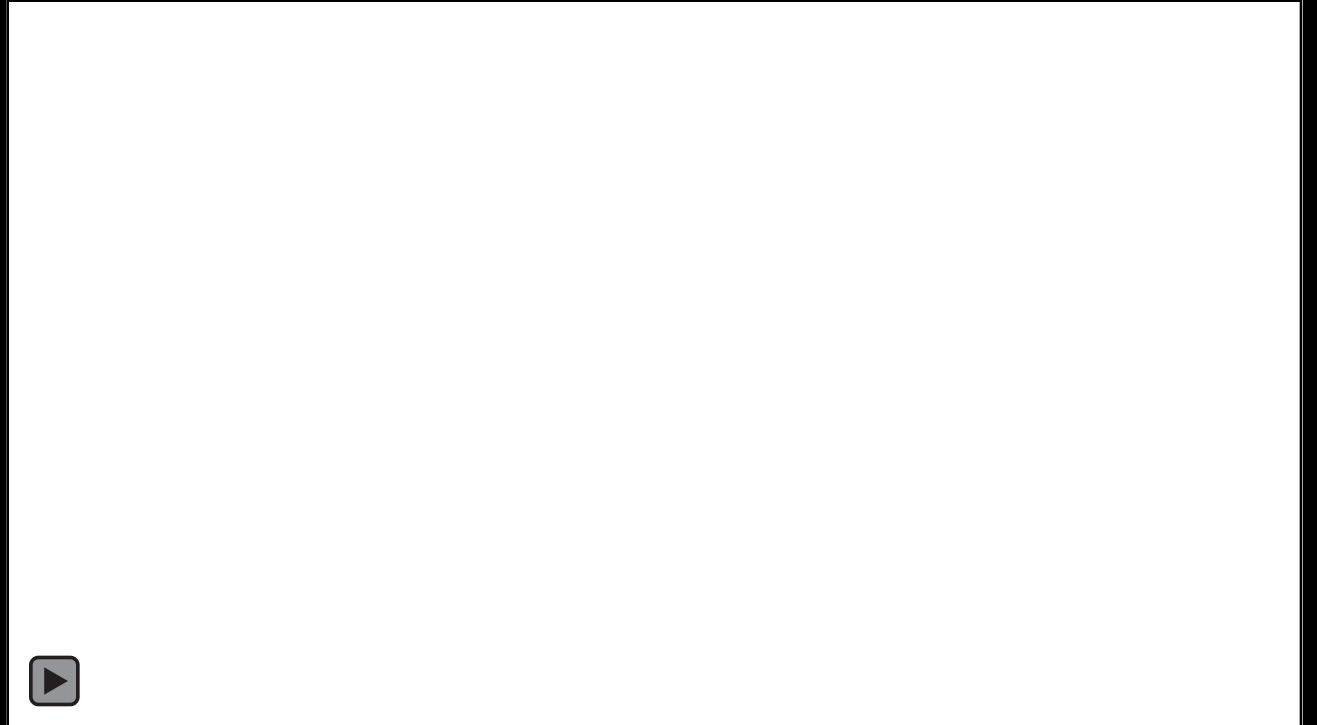
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Drink Up Paddles Up

Programme with People's Association (PA)
Water Venture

An all-in-one Science and adventure
experience featuring indoor and outdoor
elements

Participants learn about Singapore's 4
National Taps and the microbes and
organisms that play an important role in
sustaining the Marina Channel's ecosystem.

Importance of maintaining clean waterways
and the consequences of pollution

Followed by a kayaking session, families
immerse themselves in the riches of the
reservoir









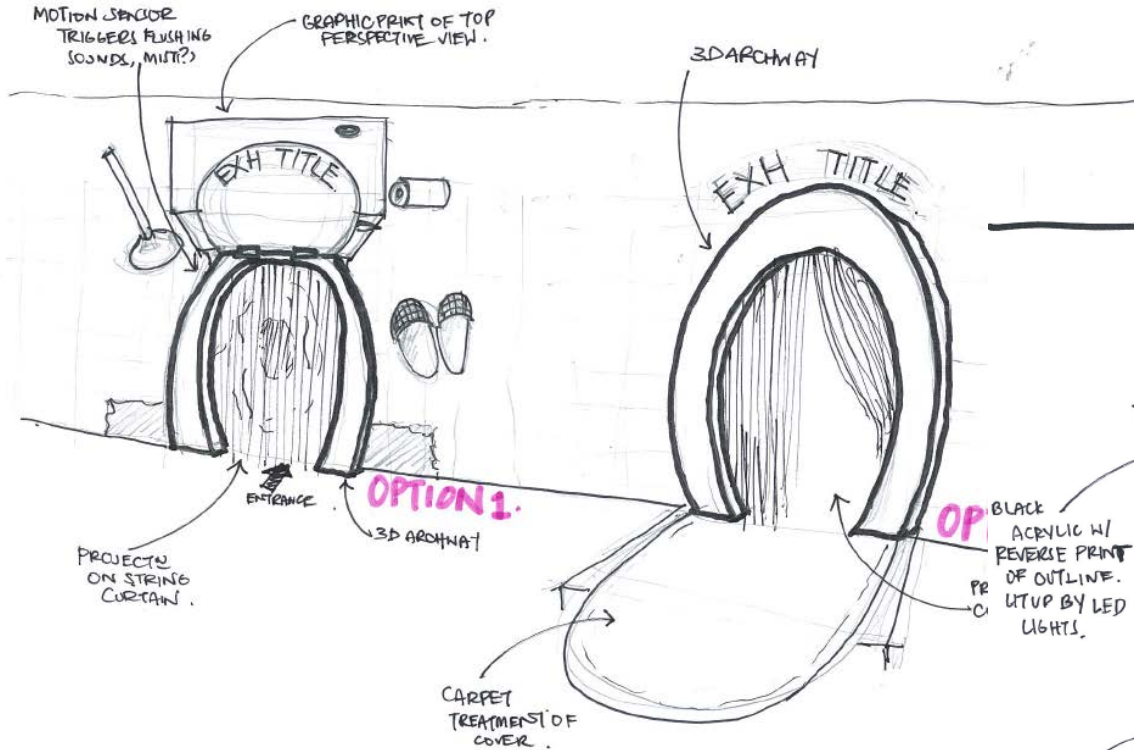
Sanitation Exhibition

Inspired by the
Journey of Poo
Exhibition at Miraikan

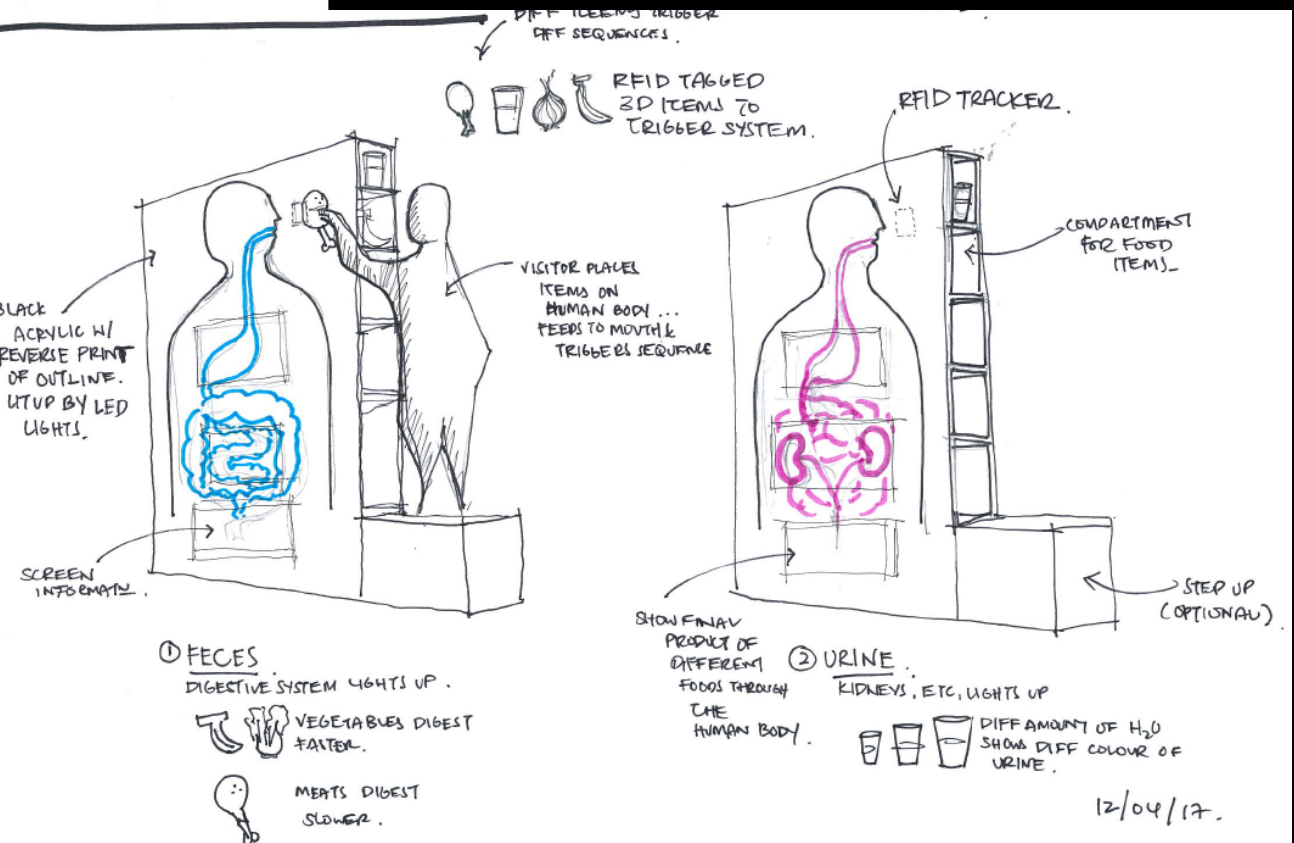


ENTRANCE STATEMENT.

CONCEPTUAL SKETCHES (NOT TO SCALE).



Sanitation Exhibition



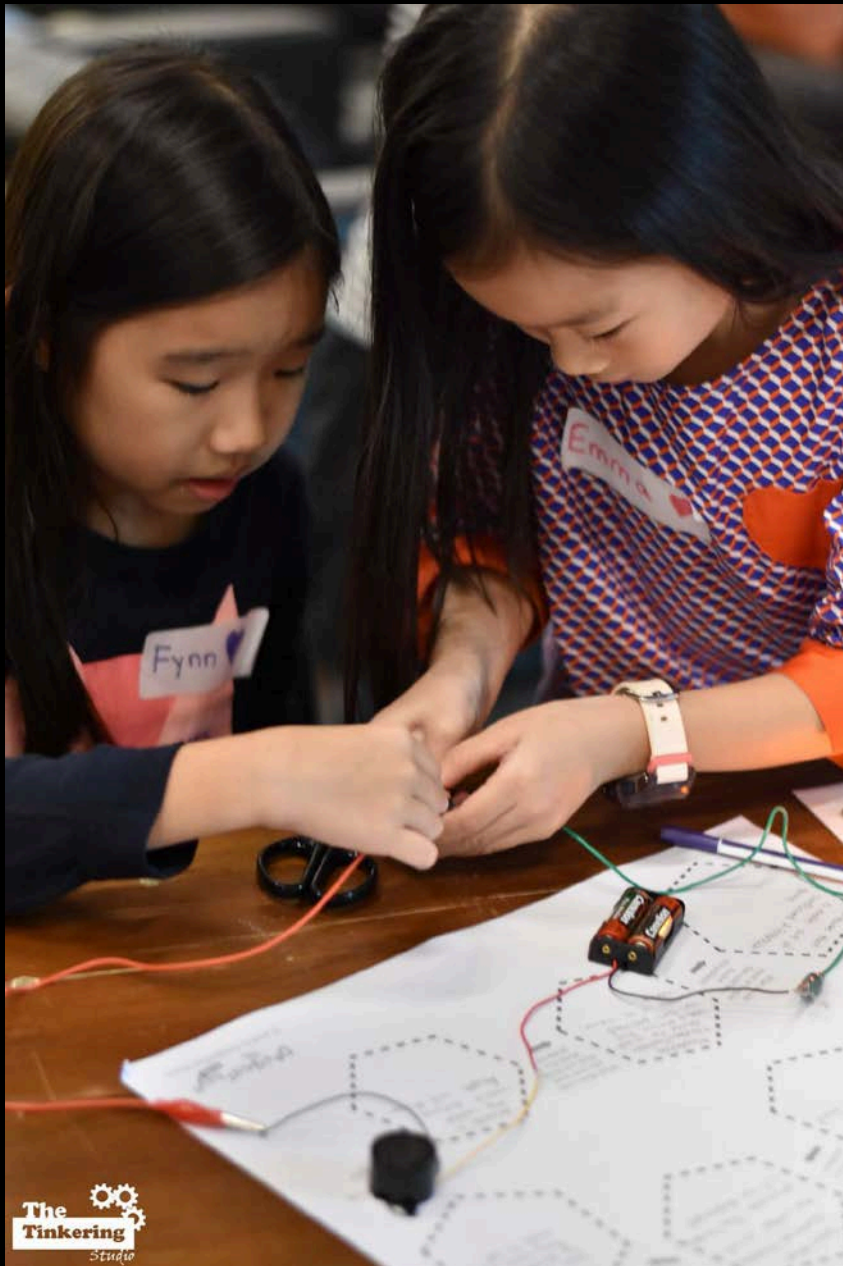
12/04/17.

Global Children's Designathon

Children develop their own ideas and build prototypes using new technologies to solve real-world problems affecting the environment and society

Challenge for this year is Water.













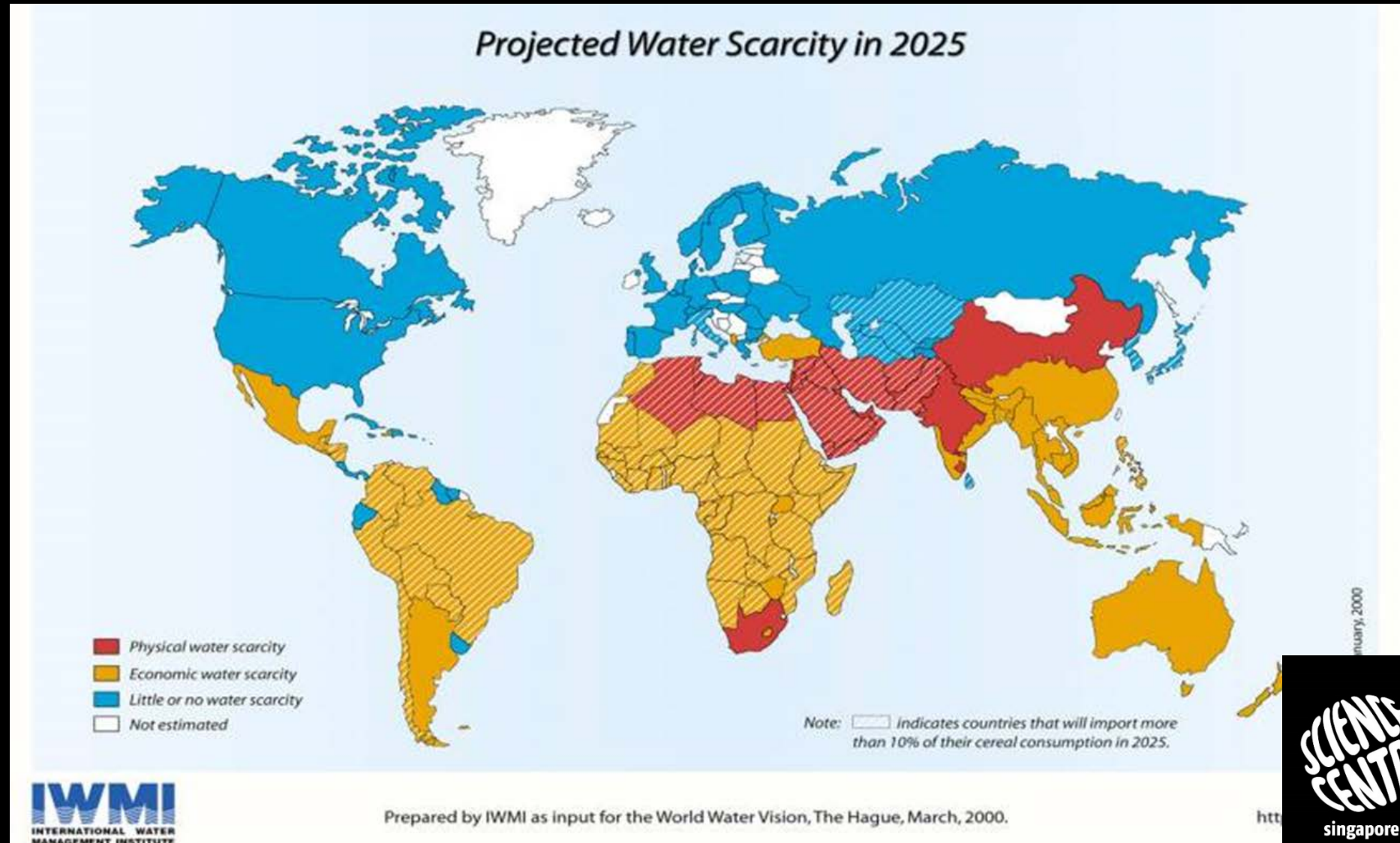


“ Years of abundant water supply as we build up our resources today may invariably lull the population and its water planners into a coma of complacency. The national psyche of water scarcity will recede, and efficiency in the use of water will slide. No amount of planning can cater to a runaway water demand. We must always present water as a national challenge for each generation to come.”

Mr Tan Gee Paw
Former Chairman
PUB, Singapore

Water Scarcity – a global issue

- By 2060, Singapore's water demand is expected to double from today's 430 million gallons a day.
- In 2000, about 800 million people in mainland Asia faced severe water shortages.
- By 2025, 1.8 billion people are expected to be living with water scarcity and 2/3 of the world's population could be living under water stressed conditions.



“Instilling a Global Psyche of Water Scarcity”

Thank You!

Science Centres' Unique Advantages

- Our experience with creating interactive engagement
- Science Centres are neutral venues
- Our connection and outreach to school and school children

- Alignment of purpose
- Clarity of deliverables
- Tracking of expenditures / outreach / impact
- Proper reporting