

Water STEAM workshops for teachers

Organized by Ganesah83 Foundation

14 May 2016 at Bandung Institute of Technology

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Objectives:

To supplement school teachers in the building of basic knowledge and desired attitude among students towards water resource management which will help build sustainable living practices in their respective habitats

(Time does not allow for a comprehensive coverage but sample activities with discussion will be used to illustrate how the resource package can be used or even expanded for school use)

Scope:

- ⌘ **Part 1:** Water = Life: What is water? What are the properties of water that make it essential for life? (From chemistry, physics and biology perspective)
- ⌘ **Part 2:** Water cycle: Types of water and water resources (From geography, earth science perspective)
- ⌘ **Part 3:** Water: the good and bad side of it to life on earth; survival issues and sustainability considerations (From civilisation, environment, urbanization, engineering perspective)

The presence of 5:



Big Question:

- ⌘ Every living thing depends on water to survive and thrive
- ⌘ What is so special about water that enables its support for life on earth?
- ⌘ Let's discuss

Water as a solvent & a separator

- ⌘ Discuss concepts of solution, emulsion, solubility, super saturation, diffusion, osmosis, osmotic pressure
- ⌘ Hands-on activity to separate colours using water and filter paper

Water surface tension

- ⌘ class activity on water surface tension
- ⌘ Try to float as many paper clips as possible in a cup of water
- ⌘ Will surface tension change if salt is dissolved in water? What about soap?

Make plastic milk for modelling

- ⌘ Try to make floating models using the plastic milk and discuss how water buoyancy is used for various purposes or industrial application
- ⌘ Try to make houses or other models that cannot be 'floated away' by water

Water capillary action

- ⌘ Demonstrate capillary action in plant's vascular system—coloured water uptake in a stalk of flowers
- ⌘ Discuss: what property of water is at work to enable capillary action to take place
- ⌘ **Fun activity: Escaping water**

Hydrophobicity

- ⌘ **Activity:** make water droplet stay on the leaf surface
- ⌘ Compare lotus leaf and other leaf surface to see which surface allows the most spherical water droplets to form
- ⌘ Discuss: What is wettability and how surfaces with different wettability maybe used in materials that can 'self-clean'

After the break

QUIZ on Water Property

(Answer True or False)

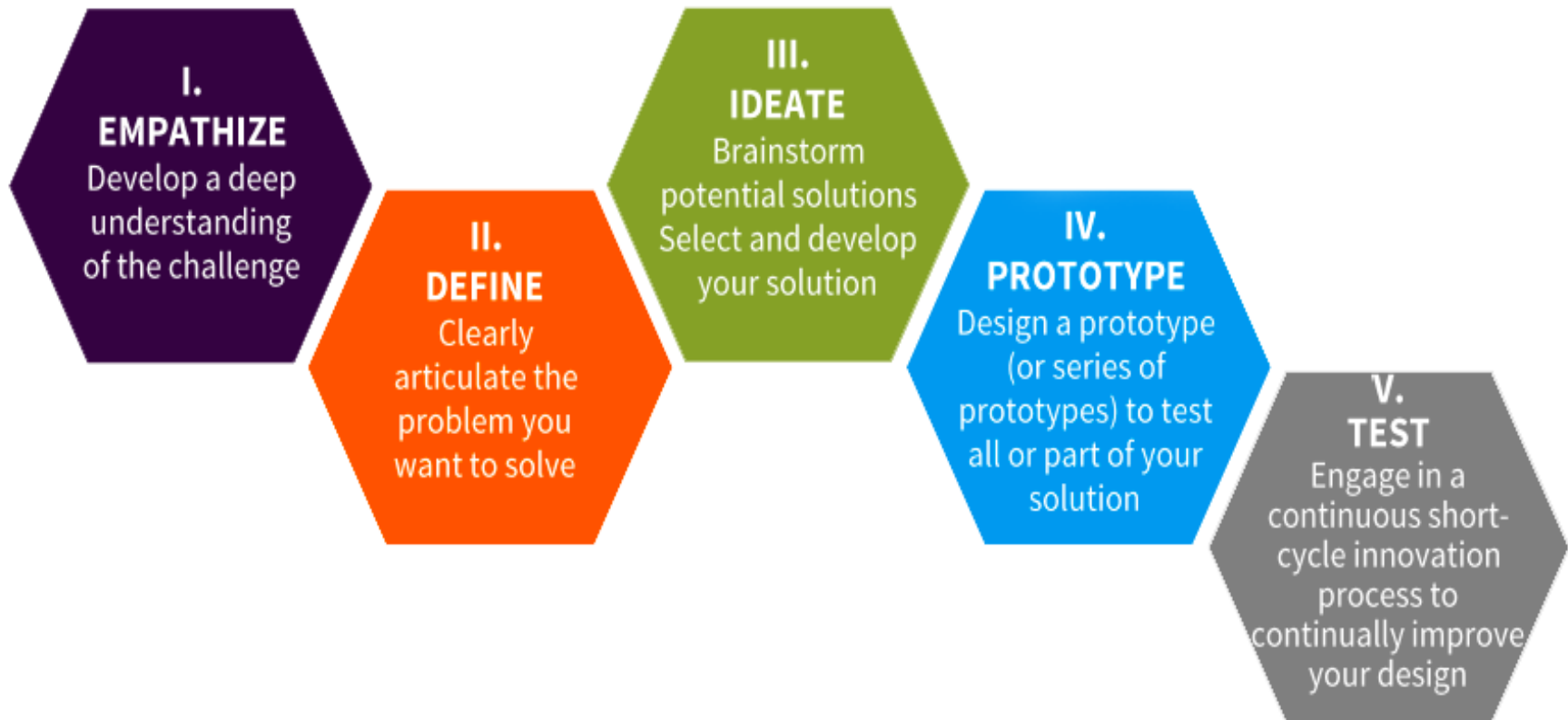
Water Cycle activity

- ⌘ Ask students to imagine they are a water droplet. They first decide their current location (for example in a pond, or a river, as a rain drop or even inside the human body) then work out its journey.
- ⌘ **work on a big piece of blank paper and sketch the water cycle or a map of the journey taken by the water droplet**

Act out a skit to show the good and bad water journey

Get students to think of props and sound effects where applicable; try to link to life on earth either as a human population or plants and animal communities (Get participants to do storyboarding as if planning for a skit)

Design Thinking



Closing remarks

- ⌘ Water is indeed a precious natural resource vital for life on earth
- ⌘ We should not take clean fresh water supply for granted
- ⌘ It is our duty as the most impactful inhabitants on earth to manage water with understanding and empathy in a responsible manner
- ⌘ We also have to use creative solutions enabled through STEAM!

Thank You

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