



AN INITIATIVE BY



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COMPUTATIONAL THINKING ACTIVITIES

Facilitated by an ACW Master Instructor as part of a Train-The-Trainer (TTT) workshop, the following activities further delve into the concepts of computational thinking mentioned in the TTT slides.

1. Concept: Decomposition

1.1. Give an example: "Grocery Shopping".

1.2. You need to go to the grocery shop.

Breakdown the tasks into smaller parts:

- Which grocery shop will you go to?
- What items do you need to buy?
- What time are you going to go?
- How will you go to the grocery shop?
- How much budget will you need?

1.3. Explain...

...that by learning to answer these questions, you are engaged in **breaking down** a complex phenomenon into smaller, simpler parts and processes.

2. Concept: Pattern Recognition

2.1. Give an example: "Analysing a football game."

- Ask each group participant to pretend that they are a football team coach. Now ask them what they would do study the opponent team.
- **Expected answers:** participants should indicate they would seek to study the opponent team's game tactics and players, i.e. identifying weak and best players.
- At the end of the activity, explain that this example pertains to pattern recognition since studying another team's game tactics and players involves the practice of analyzing and looking for repeated sequences.

3. Concept: Decomposition, Pattern Recognition and Abstraction

3.1. Group activity 1: Drawing a monster's face

- Ask participants to draw a monster's face as they imagine it on a piece of paper. Ask them not to show their drawing to anyone. Give them 2-3 minutes.

- Divide the group into smaller groups of two.
- Ask them to find similarities between each other's drawings.
- Ask for a group to volunteer and present to the rest of the participants their drawings and discuss what similarities exist between both.
- At the end of the exercise, explain to the group what happened here:
 - When initially drawing the monster, they engaged in **decomposing** the characteristics of the face.
 - When comparing each other's drawings, they engaged in **pattern recognition**: primarily identifying the main characteristics (**components**) that are similar in both drawings.
 - Finally, they engaged in **abstraction** when ignoring the insignificant characteristics/components of their drawings that were different from each other.

4. Concept: Algorithm Design

4.1. Give an example:

You are visiting the city for the first time. Ask participants to explain you how to get to the nearest grocery store.

4.2. Expected answers:

Answers related to this activity should include detailed descriptions of step-by-step directions of routes and guidance by landmarks (i.e. 'go straight until you reach a green shop to your left, then turn right, etc.')

4.3. Explain:

Algorithm design involves developing a solution to a problem by creating sequential rules to follow in order to solve the problem.

4.4. Group Activity 2

- Divide group into smaller groups of two.
- Ask group member 1 to draw a simple object on the back of the piece of paper already used for the 1st activity. Ask him not to show it to their partner.
- Once completed, ask the same person to give detailed, step-by-step instructions to group member 2 to draw the object. Group member 1 cannot see what group member 2 is drawing while giving instructions.
- Ask one group to present their drawings in front of all workshop participants.
- Ask the group to speak about their experience during the activity (i.e. How difficult is it to reproduce similar drawings based on giving and receiving instructions?)
- Give groups a few minutes to reconcile the outcome of their activity.