Unplugged Algorithm Activity #3: Scavenger Hunt

Algorithms can be linear and they can also use use logic operators AND, OR, and NOT to change the outcome of an algorithm.. In this activity, we build on the idea that algorithms can have multiple paths by having **students help design and participate in a scavenger hunt.**

Activity Overview
Estimated Time: 1h

Materials for each group of 2 to 3 students:

- Scavenger Hunt Student Sheet
- Paper and Pencil
- Mobile Device (Optional)
- Internet Access (Optional)

Materials for each student:

- Self-Assessment Student Sheet (Optional)
- Pencil (Optional)

Preparation:

- Review the Scavenger Hunt Student Sheet to ensure that students will be able to find the items either in the classroom or on school grounds. Modify the items as needed.
- If students will be using mobile devices, ensure that they are available for the activity.
- Print out 1 Scavenger Hunt Student Sheet for each group.
- Print out 1 Self-Assessment Student Sheet per student. (Optional)

Note to the teacher: A printable analog clock face can be found from the following website:
http://www.sawyoo.com/postpic/2010/11/blank-clock-face_105120.jpg.

Warm-up: Cause and Effect (10 minutes)

Ask students to think about an everyday task, such as making a peanut butter and jelly sandwich, or tying their shoes. Facilitate a class discussion or ask students to discuss in small groups using the following prompts:

- How many steps do you think it will take to accomplish the task?
- What are the steps to complete the task?
- What obstacles might you encounter during the task?

Activity: Scavenger Hunt (40 minutes)

Arrange students into groups of 2 to 3. Ensure that each group has a pencil, paper, the Scavenger Hunt Student Sheet, and optionally, a mobile device.

Review the Scavenger Hunt Student Sheet as a class. Explain that on the sheet, there's not only a list of items that they need to find, but also a list of conditions that when they occur, will trigger them to do one or more actions. Notice that the first 3 conditions already have their actions defined. Facilitate a brief brainstorming session, about 10 minutes, to come up with the remaining actions. Students may brainstorm as a class or in their groups.

Once all the actions are defined, students start the scavenger hunt. When they return from their scavenger hunt, they may share their pictures and photos with other students.

Reflections: Types of Algorithms (10 minutes)

Explain that the list of conditions and actions in the scavenger hunt is an algorithm. It has instructions that tell us what to do, but also when to do it. Facilitate a class discussion, or alternatively, ask students to reflect individually or in small groups using the following prompts:

- How is this algorithm different from the algorithm for your pizza or ping-pong rescue?
- What was easy or difficult about the scavenger hunt?
- What other conditions could you add to the scavenger hunt?

Assessment

Criteria	Approaching	Meeting	Exceeding
Student shared one or more situations where a set of conditions causes him or her to do something.			
Student helped plan the scavenger hunt by generating ideas and/or adding to other students' ideas for the remaining actions.			
Student collaborated with his or her group to carry out their scavenger hunt.			
Student shared his or her reflections either individually or in a group discussion.			

Extensions

Include logic operators in the conditions

For example, students can create conditions such as "You found item 5 OR item 6", or "You found item 2 AND item 3 AND item 7".

Scavenger Hunt Student Sheet

Adapted from Creative Photography Game:
http://www.scavenger-hunt-guru.com/photography-game.html

In this activity, you'll go on a scavenger hunt with your group to find all the items listed below:

#	Item	Found
1	Five different red items	
2	Book spines	
3	Instrument (One or more)	
4	Flower (One or more)	
5	The horizon line	
6	Sand, dirt, or stone	
7	Crayons	
8	Food	

As you find each item, see which condition has occurred, and do the corresponding action. Keep in mind that more than one condition can occur at once.

Before you start hunting, come up with the remaining actions. For example, what will you do when you find item 3, or item 4? Once you fill out all the actions, you're ready for your scavenger hunt. Happy hunting!

Condition	Action
You found an item.	Check off the item in the list. Make a sketch of the item, or if you have a mobile device, take a photo.
You found item 1.	Arrange the items in an interesting way. Make another sketch, or if you have a mobile device, take another photo.
You found item 2.	Read the title of each book. If you have a mobile device, record it.
You found item 3.	
You found item 4.	
You found item 5.	
You found item 6.	
You found item 7.	
You found item 8.	
You found all the items.	Nice job! Return to your desk and share your pictures or photos with others.

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Self-Assessment Student Sheet

Give an example or provide evidence of how you demonstrated or accomplished each of the following statements during this activity. Examples and evidence can include sketches, written descriptions, and references to photos or videos.

Statement	Example or Evidence
When brainstorming situations where a set of conditions causes us to do something, I expressed my ideas and/or supported other students by listening to their ideas.	
During the scavenger hunt, I was an active team member by helping to find one or more items and/or completing one or more actions.	
At the end of the activity, I thought about the scavenger hunt as an algorithm, and how it is different from other algorithms we've learned.	
When other students shared their pictures and photos, I gave constructive feedback.	