

WAMC Lab Template

Math Concept(s): Algorithms

Source / Text: Code.org

Developed by: Darren Sylte E-Mail: Darren_sylte@msvl.k12.wa.us

Date: 6/24/19. Summer Conference 2019

Attach the following documents:

- Lab Instructions
- Student Handout(s)
- Rubric and/or Assessment Tool

Short Description (Be sure to include where in your instruction this lab takes place):

Lab Plan

Lab Title: Real life Algorithms

Prerequisite skills: Coding with Blockley in Angry Birds

Lab objective: When this lab is completed the students will understand that an algorithm is a step by step process to complete a task.

Standards: (Note SPECIFIC relationship to Science, Technology, and/or Engineering)

Mathematics K–12 Learning Standards: Number and operations in base ten 4.NBT Use place value understanding and properties of operations to perform multi digit arithmetic.

•
Standards for Mathematical Practice: An algorithm is a step by step process to complete a task, through a order of operations.

•
K-12 Learning Standards-ELA (Reading, Writing, Speaking & Listening):

•
K-12 Science Standards

•
Technology: 1B-AB-09 Compare and refine multiple algorithms for the same task and determine which is the most appropriate.

1B-AB-15 Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

•
Engineering

•
Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)

- | | | |
|---|---|---|
| <input type="checkbox"/> Global Awareness | <input type="checkbox"/> Financial/Economic/Business/Entrepreneurial Literacy | <input type="checkbox"/> Civic Literacy |
| <input type="checkbox"/> Health/Safety Literacy | <input type="checkbox"/> Environmental Literacy | |

21st Century Skills (Check those that students will demonstrate in the above activity.)

LEARNING AND INNOVATIONCreativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Critical Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgments and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLSInformation Literacy

- Access and Evaluate Information
- Use and manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE & CAREER SKILLSFlexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Washington

Applied

Math

Council

<https://wa-appliedmath.org/>

Teacher Preparation: (What materials and set-up are required for this lab?)

- Materials White board, markers, blank sheet of paper, writing utensils

Set-Up Required:

- Start the lesson by explaining that an algorithm is a step by step process to complete a task. Write a simple word algorithm on the board.
- Example: Get out of bed
Go eat breakfast
Brush your teeth
Put on shoes
Put on coat
Go to bus stop

Have the kids get into groups of 2-4, depending on age.

Hand out the lab instructions and tell the kids to work together to create at least 2 separate algorithms.

Lab Organization Strategies:

Leadership (Connect to 21st Century Skills selected):

- Think creatively, work creatively with others, implement innovations, reason effectively, communicate clearly, collaborate with others, adapt to change, be self-directed learners, interact effectively with others, work effectively in a diverse team, manage projects, produce results, be responsible to others

Cooperative Learning:

- Working in small groups

Expectations:

- The small groups, or teams are to work together to come up with 2 different algorithms

Timeline:

- 15-20 minutes

Post Lab Follow-Up/Conclusions:

Discuss real world application of learning from lab

- Algorithms are used in every aspect in life, all around the world

Career Applications

- Computer programmer, video game developer

Optional or Extension Activities

- This lesson can be expanded to incorporate other computer programming/math vocabulary such as ; functions (brush your teeth) and variables (put on shoes, put on coat)

Lab instructions

Team names: _____

Algorithms

In a team of 2 to 4 students write down 2 separate algorithms that would guide you through a step by step process that you would do on a daily basis.

There must be a minimum of 5 steps that you would write down in your algorithm.

Name of algorithm _____

Step 1.

Washington Applied Math Council

<https://wa-appliedmath.org/>

Algorithm lab assessment:

As a team you will present your algorithm to the class.

Make sure you answer these questions before you are ready to present.

1. Did you review your algorithms as a group?
2. Does your algorithm match the names for your algorithms?
3. Can your algorithm be followed through to completion of the task by another person?

Now that your algorithms are complete and checked, you may go to the front of the class and present one of your algorithms to the class.

Start out by telling the class the title of your algorithm. Next go through your algorithm step by step to the end.

Ask if anybody has any questions for clarification.

<https://wa-appliedmath.org/>