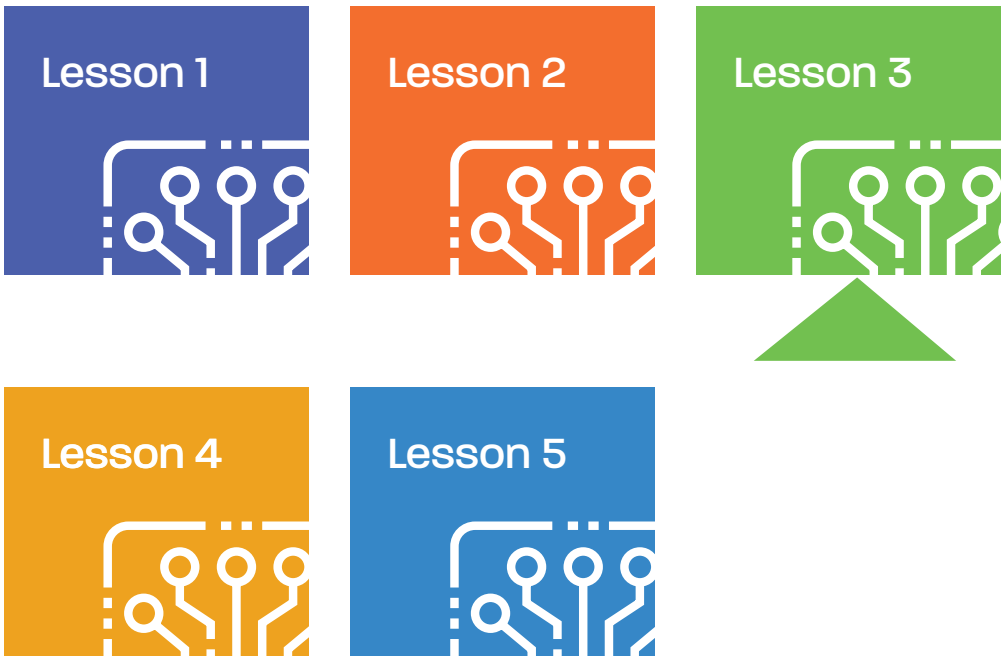
STEAM SNIPS™

Lesson Plans



Hamilton Buhl®

Lesson 3

STEAM SNIPS™

Solving Real-World Problems

Prototyping with input, control, and output logic (3 Days)

Learning Objectives

- Project management
- Brainstorming
- Collaboration
- Critical thinking
- Prototyping

Class Activity

- Students will be split into groups and brainstorm solutions to everyday problems.
- Using the principles of INPUT, CONTROL, and OUTPUT logic they will try and overcome the challenges they identify.
- Groups will design prototypes to solve their real-world problems.

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Activity Instructions:

- Break the class into groups.
- Each group will identify 3 real-world problems they face at home, school, or anywhere in daily life.
- The groups will brainstorm solutions to the identified problems using appropriate INPUT, CONTROL and OUTPUT blocks.

Planning – DAY 1

Each group can use the matrix below to develop appropriate solutions to the real-world problems they selected. Connect one item from each column to other STEAM SNIPS blocks to create 4 unique combinations that can help them hurdle their real-world challenges.

Input	Control	Output
Temperature Sensor	IF Logic Block	Buzzer
Temperature Moisture Sensor	AND Logic Block	LED
Light Sensor	OR Logic Block	LED Belt Driver
Light Sensor (High Sensitivity)	ELSE Logic Block	Vibration Motor
Flame Sensor	SPLIT Block	Fan
Water Sensor	CONNECTOR Block	DC Motor
Potentiometer (Rotatable)		Electromagnet
Potentiometer (Slider)		Recorder and Speaker
Infrared Sensor		
Distance Sensor		
Sound Sensor		
Push to make switch		
Touch Switch		
Vibration Switch		
Tilt Switch		
Reed Switch		

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Brainstorming – DAY 1

Have the groups brainstorm prototype designs using STEAM SNIPS blocks to solve real-world problems they have identified.

Students should use sketches and notes to present their ideas.

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Design Planning – DAY 2

Students can fill out the Design Planning Template below to outline up to 2 design solutions: (Day 2)

Once Design Planning Template 1 is filled out, students submit the template to the instructor for assessment and confirmation.

Design Planning Template 1
School Name/No.
Group Name
Members
Project Name
Design Brief

School Name/No.
Group Name
Members
Project Name
Design Brief

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Design Planning – Day 3

After the teacher approves the group designs, students will need to fill out Design Planning Template 2. (Day 3)

Design Planning

1. Students assign group members to individual roles; Leader, Tinkerer, Presenter, Designer, and Artist.

2. After each member has their designated roles, they will need to fill out Design Planning Template 2.

3. Have them name their product, sketch the prototype and list the STEAM SNIPS components, additional materials and tools needed to create their product.

4. Once Design Planning Template 2 is complete, the teacher will assess if the protype designs are practical and the STEAM SNIPS components outlined are being incorporated correctly.

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Design Planning Template 2

School Name/No.	Class
Group Name	
Project Name	
Delegation of Work:	
Leader	Designer
Tinkerer	Artist
Presenter	
Product Sketch	

Materials

Electronics Materials	Input:
	Control:
	Output:
	USB Cable:
	Power Control:
Structure Material	
Tools	

Lesson 3

Summary

(5 minutes)

Standards-Aligned

CCSS:
CSS.ELS-LITERACY.RST.6-8.3
CSS.ELS-LITERACY.RST.9-10.3
CSS.ELS-LITERACY.RST.11-12.3

ISTE:

ISTE Empowered Learner	1c, 1d
ISTE Knowledge Constructor	3d
ISTE Innovative Designer	4a, 4b, 4c, 4d
ISTE Computational Thinker	5a, 5b, 5c, 5d
ISTE Creative Communicator	6a, 6b, 6c, 6d
ISTE Global Collaborator	7b, 7c

NGSS:

NGSS MS-ETS1-2	Engineering Design
NGSS MS-ETS1-4	Engineering Design
NGSS HS-PS3-3	Energy
HS-ETS1-2	Engineering Design

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