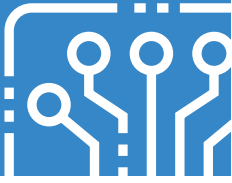


STEAM SNIPS™

Lesson Plans



Lesson 5



STEAM SNIPS™



Lesson Description

Explore and investigate the Joint Block and LabPlus to begin coding the STEAM SNIPS Kit. Students will learn the fundamentals of coding by putting their creativity and knowledge into action to control physical objects through the power of programming. In this lesson, students will be tasked with writing programs that will then be uploaded to the Joint Block and create systems that solve real-world problems.

STEAM Targets

Science: Understanding the principles of the STEAM SNIPS Output Blocks and how these concepts are used in the real-world.

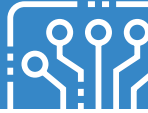
Technology: Using Inputs to change the behavior of Outputs. With the LabPlus software, students will create code to influence the function of an invention.

Engineering: Students will build their very own products using STEAM SNIPS as well as arts & crafts materials and will control how they operate by creating code in LabPlus.

Arts: The products students create will need to be both aesthetically pleasing and function as intended.

Learning Objectives

- Understand coding fundamentals
- Evaluate and analyze code
- Apply logical reasoning
- Forward and creative thinking
- Problem solving



Class Activity

- Students will be separated into teams to create unique products with STEAM SNIPS
- Using what they've learned about working with STEAM SNIPS – input, output, and control blocks – students will brainstorm inventions and products they can create using the kit.
- After deciding what their group wants to create, they will need to outline and record their concept, the materials they will need, and how their final product will look and function.
- Once their projects are outlined and approved by the teacher, they will then build and test their creations.
- The class will use peer evaluations to grade each other's projects.

Activity Instructions

Download LabPlus on PCs the students will be using.

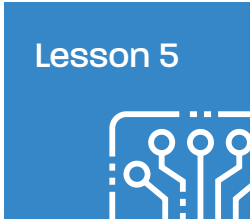
- Break the class into teams.
- Each team will begin by brainstorming products to create which will solve real-world problems.
- Students will then record the materials they will need and accurately describe their product, how it works, and sketch a design.
- Students must create their own code in LabPlus to help their product function as intended.
- Upload code onto the Joint Block and begin creating the product.
- Have students build their product out of arts & crafts materials.
- Incorporate STEAM SNIPS into the product they build.
- Test their code, design, and ensure the product functions as intended. If it does not, have students go back and address the problems they encountered.

How to Use LabPlus and STEAM SNIPS Joint Block

In-depth walkthrough of how to work LabPlus and the STEAM SNIPS Joint Block.

Required STEAM SNIPS Block

Joint Block – This module is the bridge between LabPlus and the rest of the STEAM SNIPS Blocks. Upload the code created in LabPlus to the Joint Block using the steps outlined in “How to Use LabPlus and STEAM SNIPS Joint Block”.

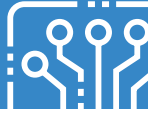


Brainstorming – Day 1

Groups will brainstorm different products they can create using STEAM SNIPS, the Joint Block and LabPlus. These products should solve real-world problems that students face in their everyday lives.

While brainstorming, students should keep track of the materials they will need and list which STEAM SNIPS Blocks will be required to create their invention as well as how the Joint Block will come into play.

Record the brainstorming process with sketches and notes in the section below.


 Planning Phase –
 Day 2

After the brainstorming process, teachers can review, approve, or suggest changes to students designs. Once students and teachers are happy with the project concept, the next step is to create a list of the components and materials needed in order to turn their invention into reality.

Catalog Components/Tools/Function

Pass out the table below so students can fill in the STEAM SNIPS Blocks, Materials and Tools they will need to complete their design.

Main Concepts

1. Which STEAM SNIPS Blocks, materials and tools are needed to make the invention function as designed?
2. Keep in mind what variables will their code take into consideration. How will they go about coding the Joint Block in order to make the product function as intended?
3. How will each component be used and what role will the play?
4. Record what the desired function of the product.

 Components and
 Tools Table

STEAM SNIPS CREATION	STEAM SNIPS Blocks	Materials	Tools
Identify Critical Components			
Amount Needed			
How It Will Be Used			



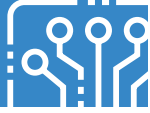
Each group will need to answer the following questions thoroughly in the provided space.

What logic will the Joint Block enact?

What is the goal of the code that will be written in LabPlus?

Once the Components and Tools table and the Joint Block logic is outlined, each group needs to record exactly what they want their project to do and how it should function in the space below. This can be referenced throughout the build process.

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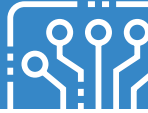


LabsPlus Coding – Day 3

The next step is to have students code the Joint Block. Have the students open LabPlus and familiarize themselves with the software. Begin by having them recreate programs outlined in “How to Use LabPlus and STEAM SNIPS Joint Block”.

After students have a clear understanding of how to work with LabPlus and the Joint Block, have them refer back to their notes and in the space below, write a few sentences explaining what they want their code to do.

Now it's time to write the code that will be used in their projects. Have them upload their code to the Joint Block. After uploading the code they want to use with the Joint Block, make sure they connect the STEAM SNIPS Blocks they will be using and test it to make sure it functions as intended.



Project Construction – Day 4

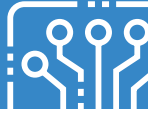
It's time to have students build their inventions using the materials and STEAM SNIPS Blocks they outlined during Day 2. Emphasize the importance of sticking to their plans they outlined in the sections above. If revisions need to be made, use a different colored pen and record any changes. Have students record why these plans needed to change and what is the goal of their revisions.

In the space provided below, students should record challenges they experienced throughout the build process and how they overcame these roadblocks.

Students should outline:

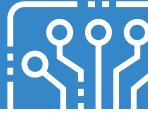
- Revisions they made to their plans and why
- Challenges they had to overcome
- What they learned

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Each group should record exactly what they want their project to do and how it should function in the space below.

This can be used as reference throughout the project construction section.

**Project Construction**

After identifying the projects the groups want to make and the Components and Tools Table is filled out, the next step is to have students bring their creations to life. They should stick to their plans they laid out in the brainstorming and Components and Tools section.

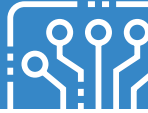
If a group is moving through their build and realizes they need a tool or material that wasn't included in their plans, they should go back and update the Components and Tools Table in a different color pen.

In the section below, have students record challenges they came across throughout the build process and how they solved these problems.

They should also note any revisions they had to make on the Components and Tools Table and explain why these adjustments were needed.

Emphasize the importance of recording a project throughout development and adjusting the plan to meet the actual needs of a design. This will help others that want to recreate the project in the future and help assess which STEAM SNIPS, materials, and tools students will need if they create other projects.

Lesson 5



Presentation and Peer Review



Print Peer Assessment Rubric

Each group now has a chance to present their creations to the class. Students should explain each step they had to take to create their project, from brainstorming to construction and everything in between. Have them review the challenges they faced and how they overcame these obstacles.

Pass around the Peer Assessment Rubric below to the class to help the class assess each groups performance.

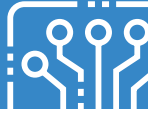
PEER ASSESSMENT RUBRIC

Teacher

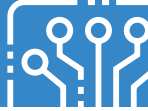
Group

Standard Level	Brainstorming	Application	Creative	<ul style="list-style-type: none"> • Very Good • Good • Average • Improving
Electronics Setup	Use similar examples of STEAM SNIPS blocks from previous lesson	Apply and use STEAM SNIPS blocks in different scenario	Apply and use STEAM SNIPS blocks effectively in a real-life scenario	
Coding the Joint Block	Used logic and critical thinking to make sure their code works and functions as intended.	Apply the correct Input / Output modules to work with the code uploaded to the Joint Block	The construction of the project works intuitively with the code created for the Joint Block	
Overall Presentation of Project	Function explanation presents the scenario simply	Function explanation presents the scenario clearly	Function explanation presents the scenario realistically	
Class Presentation	Presents the gist of main ideas to audience	Presents the main ideas clearly	Presents a functioning project that works as intended	
OVERALL				

Lesson 5



Summary



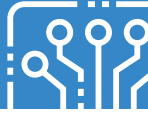
Standards-Aligned

NGSS:

K-2-ETS1-2	Engineering Design
3-5-ETS1-1	Engineering Design
3-5-ETS1-2	Engineering Design
MS-ETS1-1	Engineering Design
HS-ETS1-1	Engineering Design
HS-ETS1-3	Engineering Design
4-PS3-4	Energy
HS-PS3-3	Energy

ISTE:

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



PEER ASSESSMENT RUBRIC

Teacher

Group

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