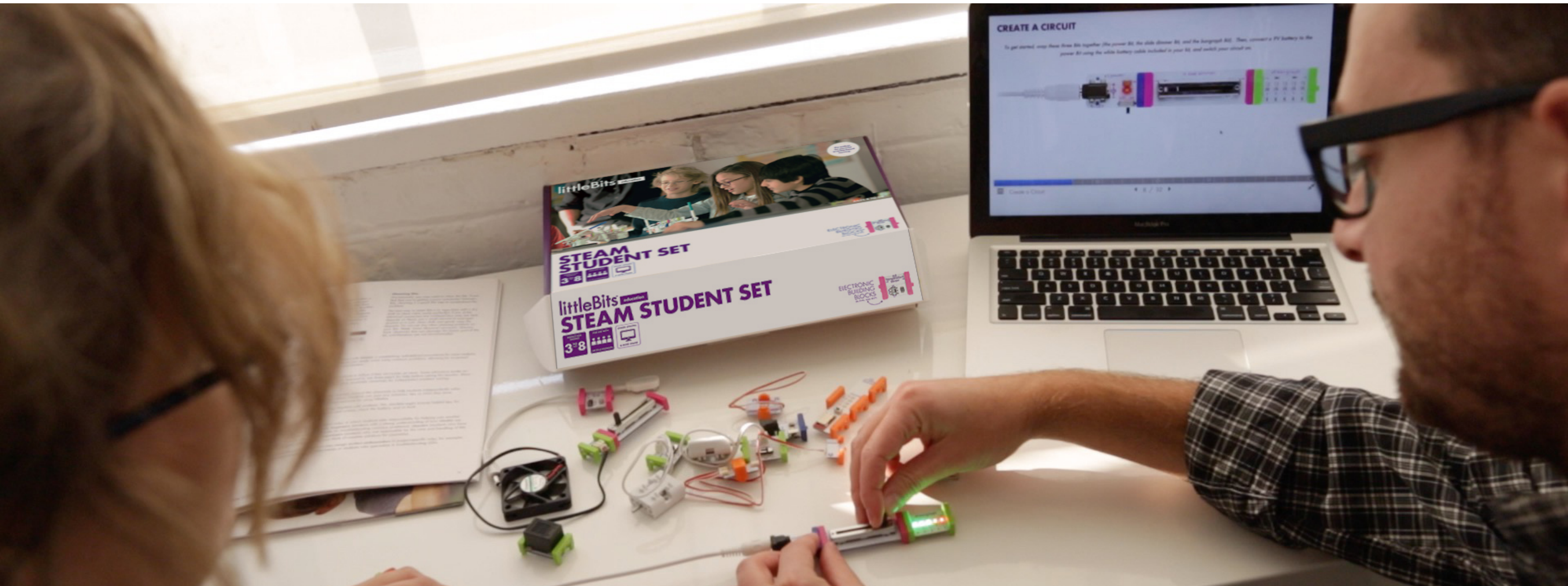




[littlebits.cc/steam-pd](http://littlebits.cc/steam-pd)  
[education@littlebits.cc](mailto:education@littlebits.cc)

# INTRODUCING LITTLEBITS STEAM PD



littleBits STEAM PD is an easy way to empower your teachers to bring 21st-century learning to their classrooms.



# LITTLEBITS STEAM PD



- INCLUDES:**
- 6-hour online course (5 self-paced sessions)
  - PDU certificate upon completion

Our stand-alone PD offering supports educators in integrating STEAM teaching into the classroom in grades 3-8 through an interactive, hands-on course combining online and offline learning.

**\$199.95 STEAM PD stand-alone (if you already own a kit)**



**RECOMMENDED:** littleBits STEAM Student Set to maximize course learning experience. **Bits are required to complete the course.**

**\$499.90 STEAM PD course + STEAM Student Set bundle**

# STEAM ACROSS THE CURRICULUM—COURSE GUIDE

This self-guided online course is broken into five sessions:

1. Welcome to littleBits
2. Inventing with littleBits
3. STEAM and the Invention Cycle
4. Managing the littleBits Classroom
5. Developing a STEAM lesson plan

Teachers will need about an hour for each session, plus some additional time for reflection, planning, and developing the lesson they'll create and deliver in Session 5.

By the end of the course teachers will have:

- An understanding of how littleBits infuses STEAM across the curriculum
- Explored different instructional strategies for using littleBits
- An appreciation for how the Invention Cycle develops creative confidence
- Gained insights about implementing littleBits in the classroom
- Designed and put into practice STEAM-based lessons



# SESSION 1 OUTLINE

Play! Create! Invent! Doesn't sound like school, right? This course will show teachers how their students can become inventors, using littleBits as a tool to:

- Open up the classroom to new possibilities
- Break down barriers between subjects
- Foster inquiry, innovation, and invention
- Encourage risk-taking and learning through play
- Improve technology fluency
- Prepare students for the future





# SESSION 1 SCREENSHOT

## 1. MAKING STEAM INTEGRATION FUN AND EASY

littleBits materials make STEAM integration easy and fun across all subject areas and grade levels! Many lessons are available to browse on the ["lessons" page](#) of the littleBits website. littleBits lessons, shared by teachers like you, are categorized by Difficulty, Grade level, and Subject Area, as shown in the captions below.

*Select the icons to learn about these example STEAM lessons.*

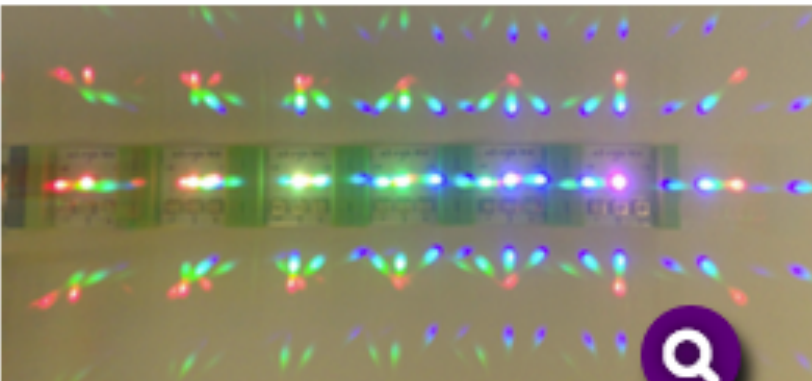
Beginner, Elementary, Math



Beginner, Middle, Language Arts



Intermediate, Middle, Physical Science



Advanced, Elementary, Science



*Reflect on the following question after looking at the lessons: Do you have any ideas of how you might use littleBits in any of your lessons?*





## SESSION 2 OUTLINE

In this session, teachers will familiarize themselves with littleBits as a tool for inventing. They will discover how easy it is to make littleBits circuits, then dive into a design challenge.

By the end of this session, they will be comfortable with connecting and adjusting Bits, as well as using them to create a working model of an invention that they will design.



# SESSION 2 SCREENSHOT

## CREATE A CIRCUIT

*To get started, connect a 9V battery to the power Bit using the white battery cable included in your kit, and switch your circuit on (a red light will glow). Now snap the bargraph Bit to the power Bit to make something happen! Try adding the slide dimmer in between these Bits, as shown in the picture below.*





## SESSION 3 OUTLINE

In this session, teachers will learn more about the Invention Cycle, a structure they can use to craft learning experiences that not only teach content, but develop the skills and characteristics vital to student success in school, career, and life.

Teachers will become inventors, taking a project from start to finish. Along the way, they will learn how the Invention Cycle naturally brings STEAM into learning across the content areas and explore examples of how other teachers are using littleBits in their classrooms.





# SESSION 3 SCREENSHOT



## CLASSROOM EXAMPLE: CIRCLES, CIRCLES, CIRCLES

With littleBits, students quickly learn that there is more than one way to solve a problem. Not only can you change the circuit, you can also change the surrounding materials, making for seemingly infinite possibilities! In a math lesson targeting a better understanding of the relationship between the diameter and circumference of a circle, a teacher asks students to create their own circle-drawing machines. The students, already familiar with the DC motor, start the project in the Remix stage of the Invention Cycle, designing their own solutions. While the lesson targets specific math content standards, it also provides an excellent STEAM opportunity, requiring students to use creativity and engage in the design process.

Read specifics about the lesson, "[Circles, Circles, Circles](#)" on the littleBits lessons page.



*View two possible design solutions:*





# SESSION 3 SCREENSHOT



## Classroom Example: Circles, Circles, Circles (cont.)

What makes “good” remixing? Creativity can be hard to assess. Partnering with students by asking them to self-assess their performance is important not only for making the assessment cycle more manageable for teachers, but also for encouraging students to be more self-directed in their own learning. Two possible self-assessment tools to use with lessons like Circles, Circles, Circles include checklists and documentation reports.

## SCAMPER checklist

**Directions:** Use this checklist to keep track of your brainstorming process. You do have to record all your ideas, just your most interesting ideas.

☒ **Substitute:** What other Bits can I swap into the design?

DC motor ↔ Servo. Could the servo somehow replace the motor. Maybe I could use the limo as well.


☒ **Combine:** Can I combine ideas or circuits to make my design more successful?

I wonder if I can combine some of the things I've seen with gears @ littlebits with this project.

☒ **Adapt:** What else have I seen with littleBits that might help my project?


The rot bit seems useful. Check out the laser in G+G kit.

**Checklists:** Identify specific steps you expect students to complete as they remix their project.



## Problem/Solution Report

**Directions:** As you design with littleBits, document problems you encounter as well as your solutions.

Problem	Solution
<p>We could not get the turntable to stick to the DC motor.</p>	<p>We attached the motor mate to the DC motor, then slipped a toothpick through the motor mate. Finally we taped the toothpick to the carboard</p> <div style="text-align: center;">  </div>

**Documentation Reports:** Ask students to document their design process and describe how they overcame problems.

CHOOSE AGAIN



## SESSION 4 OUTLINE

This session is designed to get teachers thinking about how they will best manage littleBits and other materials in a way that ensures organization and quick setup to optimize learning opportunities. They will also consider a variety of implementation models and begin making a plan for what their littleBits classroom might look like.



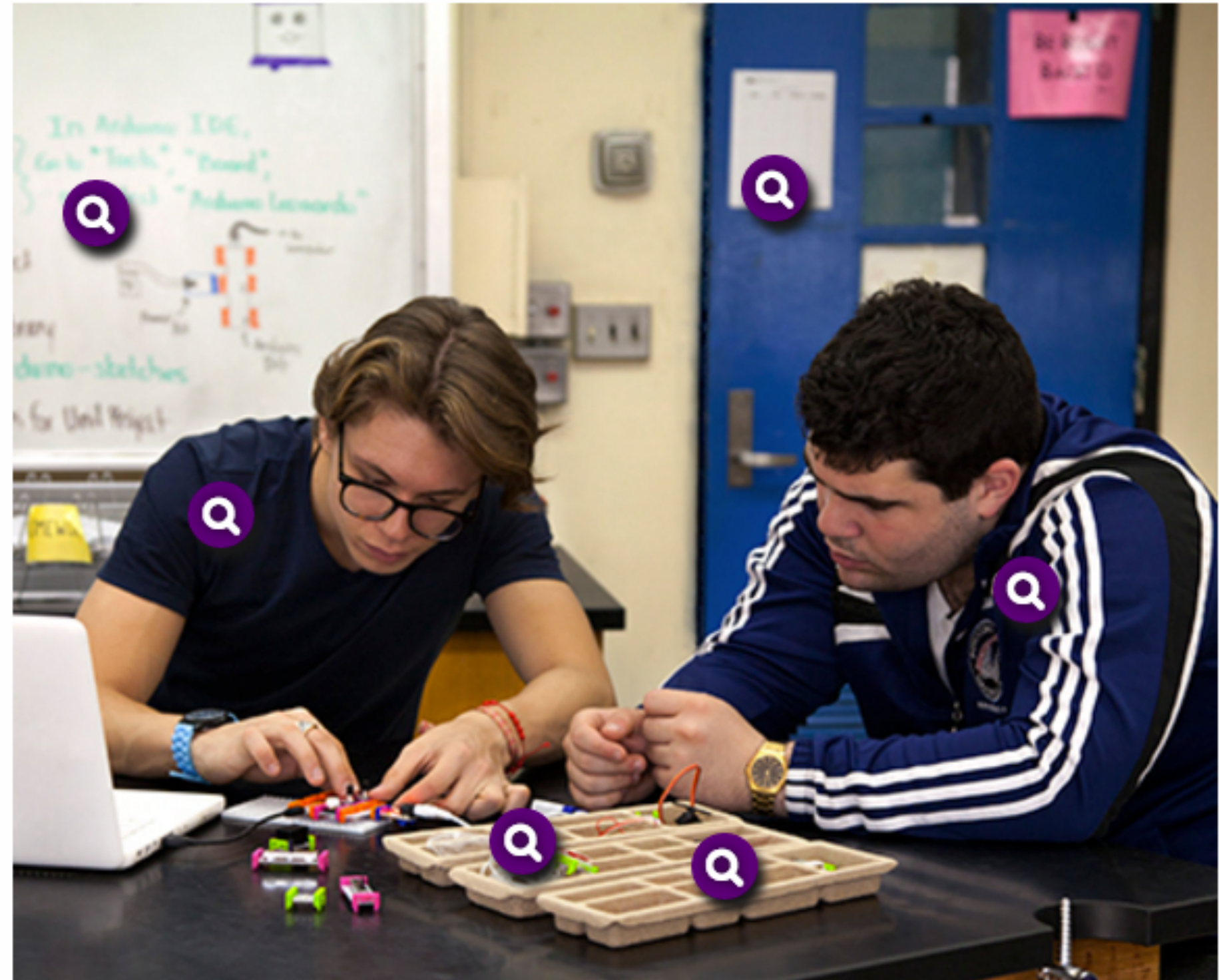


# SESSION 4 SCREENSHOT

## CLASSROOM MANAGEMENT

A successful littleBits classroom begins with purposeful design. How you establish student protocols, how you organize your Bits, and how you group your students are important considerations as you begin to implement littleBits into your lessons.

*Select each hotspot in this image to learn more about managing the littleBits classroom, and begin thinking about what might work best for your own students.*





## SESSION 5 OUTLINE

In this course teachers have:

- learned about the Bits
- figured out how they will manage them in the classroom
- thought about different instructional applications

Now participants will write, document, and publish a STEAM lesson that makes use of littleBits. It is unlikely they will complete this session all in one sitting. Teachers may choose to read through it once to understand the steps to follow before publishing your lesson online.





# SESSION 5 SCREENSHOT

## TEACH

Provide time for students to create and play with littleBits and begin to generate questions for further exploration and invention.

Consider:

- What specific concepts would be useful for students to understand in order to be successful with this lesson?
- What concepts can students discover through play with littleBits, and what concepts are best taught through explicit instruction?
- What steps would help students refine and improve their design? For example, remixing, sketching or peer brainstorming.





# CASE STUDY: **COLONIAL SCHOOL DISTRICT, PA**

## **CONTEXT**

Curriculum Supervisor of Innovation and Learning Sergio Anaya has used littleBits extensively in the district's technology curriculum at the elementary school level. This fall, the district is scaling up with littleBits at the middle school level by using cloudBits and wireless modules that let students create and design more sophisticated prototypes. Some of the middle school teachers were struggling a bit with integrating the Bits into their instruction.

When Sergio heard about the new littleBits STEAM PD, he immediately wanted a few of his middle school teachers to take the course in order to get them more comfortable with littleBits and teaching STEAM.





# CASE STUDY: **COLONIAL SCHOOL DISTRICT, PA**



## **REACTIONS**

*"I thought that the material that was provided was really amazing. All of the information that you have is something I wish that I had seen before actually starting our unit on littleBits. It was broken down in a way that way very manageable and easy to understand....I also really liked the pace of the sessions. You could work at your leisure and spend more time going over, in depth, some of the links if you wanted to, or you had the option to just quickly glance over something. The videos were a valuable tool, and I appreciated the assessments too."*

**–TOM PIERANTOZZI**

Teacher

*"[STEAM] is an area where there aren't many experts out there who can help us...this course basically gave the teachers more ideas and gave them more confidence in using littleBits."*

**–SERGIO ANAYA**

Curriculum Supervisor



Request a free quote at  
[littlebits.cc/steam-pd](http://littlebits.cc/steam-pd)