Smart Home Technology
UNIT OVERVIEW

The Smart Home Unit is an online, project-based learning curriculum designed by CompTIA Spark. Each of the included lessons asks students to learn and actively apply digital skills to help them solve real-world problems. Each of these lessons is connected by a shared theme: You are a product designer at Fony, a home technology company with the mission to make the lives of their customers easier, safer, and healthier through the creation of automated and smart devices. Through this unit, students will investigate the essential elements of the Internet of Things (IoT), the input, processing, output (IPO) model, and the basics of software engineering.

UNIT DETAILS

- Grade level: 5th-8th grade
- Length: 10-15 hours of class time
- Cost to implement: Free

MATERIALS

- Enough computers for 1:1 ratio during class
- Internet connection strong enough to stream videos from multiple devices at the same time.
- Access to the CompTIA Spark online learning platform
- Student accounts for **Tinkercad** Circuits

HIGH-LEVEL LEARNING OBJECTIVES

By the end of this unit students will:

- Learn how to use CompTIA Spark's Smart Home Simulator to pseudocode automated and smart devices
- Understand how to code prototypes of automated and smart devices in Tinkercad Circuits
- Understand how smart devices communicate with each other through the internet to make life easier and safer for customers
- Explore the role that IoT will play in our society in the future
- Demonstrate and identify interests in a tech or career pathway while investigating issues surrounding IoT and smart home technology
- Have developed 21st-century skills including collaboration, critical thinking and persistence

STANDARDS ALIGNMENT
- Click here for a **standards alignment** sheet including ISTE, and CSTA standards.

HOW THE CURRICULUM WORKS

PROJECT-BASED LEARNING IN WEB CREATIVITY AND PRODUCTIVITY APPS

- Each lesson will ask students to work through the progression of creating devices for their smart home by choosing a persona to follow through the course of the unit. They will customize devices for their persona, and combine them in a culminating project to create a smart home system in Tinkercad Circuits.
- Each project is designed to be highly engaging, and rigorous and expose students to a variety of important tools and functions in the application.
- Projects are all based on simulations that mirror real-world applications to show the importance of connectivity, computational thinking, and IoT technology.

SELF-PACED ONLINE INSTRUCTION

- Each lesson includes a series of steps and instructional videos that help students build both automated and smart devices with templates and differentiated options available as needed.
- The student activities are designed to parallel the progression of home device technology over time. This approach helps students build an authentic understanding of not only how technology has evolved but also why limitations in technology drive each successive leap forward.
- Students will access these help resources through the CompTIA Spark online learning platform where they can choose to watch and rewatch the videos at their own pace.

FACILITATION: YOUR CRITICAL ROLE

- This unit is designed to be taught by anyone with little to no prep.
- Teachers do not need to be experts (or even familiar) with the technologies used in the projects.
- It is recommended that students work in pairs to help each other, but submit their own individual products and assignments.
- Students should learn to rely on themselves and their peers for help and expertise instead of their teachers.
- Instead of providing instruction, teachers play the critical role of facilitator and coach and should spend the bulk of their time in class circulating among the students and providing 1:1 support and coaching as needed.

UNIT PLAN

LESSONS:

Lesson #	Title	Lesson name and details	Estimated Time	Resources
1	Tech@Home: Building Smarter Living	Students will investigate the progression of devices from their simplest form to becoming smart devices currently being utilized in homes.	45 Minutes	Student Worksheet Lesson Plan Slide Deck
2	Introduction to Automated Devices	Students will investigate the function of various home devices and how they became automated to complete a task using the CompTIA Spark Smart Home Simulator.	90 Minutes	Student Worksheet Lesson Plan Slide Deck
3	Automated Devices in Tinkercad Circuits	Students transition their automation design from the home to the Tinkercad simulation to show how devices can be prototyped in Tinkercad Circuits to complete the same skills as in the Smart Home Simulator.	45 Minutes	Student Worksheet Lesson Plan Slide Deck
4	How Did Devices Become Smart?	Students will be able to Identify what makes a device a "smart device" and how to program them using pseudo code. They will be able to explain why it's important to be able to have connected smart devices within their home.	90 Minutes	Student Worksheet Lesson Plan Slide Deck
5	Creating Smart Devices in Tinkercad Circuits	Students will then create prototypes of smart devices in Tinkercad that include a smart app, server, and device to control various aspects of their smart home.	90 Minutes	Student Worksheet Lesson Plan Slide Deck
6	Putting it All Together in Your Tinkercad Smart Home	Students will create and explore the production of a true smart home scenario where they will program two smart devices in the same simulation to communicate through a server and Smart App	45 Minutes	Student Worksheet Lesson Plan Slide Deck

7	Investigating Internet of Things Issues	Students will investigate various issues that surround IoT technology and its global impact.	90 Minutes	Student Worksheet Lesson Plan Slide Deck

ASSESSMENT

Each lesson has several opportunities for assessment, including:
- A short, auto-graded multiple-choice assessment after each lesson
- A reflection question after each lesson to highlight 21st-century skills
- A product rubric to assess the artifact that was created with the lesson

DIFFERENTIATION

- Each lesson contains robust extension activities for students who finish early or need more of a challenge.
- Each lesson contains self-paced videos with closed captioning to help students who are more visual/auditory learners, and learners who may need to replay the videos more than once.
- The unit can be spread out over a longer period of time for students who need more time, or for students who wish to explore all the extension activities.

WEBSITES/APPS USED IN THIS UNIT

- Google Drive or Microsoft Office online
- Google Docs or Word
- Chrome Music Lab's song maker https://musiclab.chromeexperiments.com/Song-Maker
- Limited version of Scratch https://safescratch.netlify.app/
- Google Sheets or Microsoft Excel
- Google Slides or Microsoft PowerPoint