# Artificial Intelligence and Chatbots
## UNIT OVERVIEW

The Artificial Intelligence (AI) 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 creating a chatbot to better serve the customers of your family's pizzeria!

This unit is designed with a unique structure of phases that both exposes students to a variety of technology, applications, and experiences to model the same path that artificial intelligence has taken over the last 50+ years.

## 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 MyHub CompTIA Spark app.
- Student accounts for Voiceflow and Canva.

## HIGH-LEVEL LEARNING OBJECTIVES

By the end of this unit students will:

- Learn how to use Voiceflow, Canva and other software to create an effective chatbot
- Understand how computers understand and generate natural language
- Demonstrate and identify interests in a tech or career pathway
- Describe various biases and ethical issues that surround the creation and use of chatbots
- Explore the role that AI will play in our society moving forward into the future
- Have developed 21st century skills including collaboration, critical thinking, and persistence

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## STANDARDS ALIGNMENT

- Click here for a [standards alignment](#) sheet including ISTE, CSTA, and AI for K-12

## 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 a chatbot for their family-owned pizzeria. The unit starts by building background knowledge and then asks students to apply that knowledge to create a simple rule-based chatbot. By the end of the unit students create a large language model chatbot that is capable of answering text-based input from a user about the pizzeria, as well as the ability to recommend meals for customers.
- Each project is designed to be highly engaging, rigorous, and expose students to a variety of important tools and functions in the application.
- Projects are all based in real- world work that happens within these applications.

### Self-paced online instruction

- Each lesson includes a series of steps and instructional videos that help students build a chatbot project from scratch with templates and differentiated options available, if needed.
- The unit's student activities are designed to parallel the progression of chatbot technology over time. This approach helps students build an authentic understanding of not just how technology has evolved and but also why limitations in technology drive each successive leap forward.
- Students will access these help resources through the CompTIA Spark learning application 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 | Objective | Estimated Time | Resources |
|--------|-------|-----------|----------------|-----------|
| 1 | Exploring Chatbots and Their Use | Students will be taught the difference between rules-based and natural language-based processing chatbots as well as ethical issues that surround their use. | 45 Minutes | Student Worksheet Lesson Plan |
| 2 | Introduction to Chatbot Flow | Students will learn about the language processing basics needed to create the chatbot. They will explore ways to use intents and inputs from the user and extract key information to create desired output | 90 Minutes | Student Worksheet Lesson Plan |
| 3 | Creating Your First Chatbot | Students will create a rule-based chatbot based on the chatbot flow chart that they created. | 45 Minutes | Student Worksheet Lesson Plan |
| 4 | Limitations and Iteration | Students will be able to explain the limitations of rule-based chatbots as they create more complex renditions of their chatbot. | 90 Minutes | Student Worksheet Lesson Plan |
| 5 | Natural Language Processing | Students will learn about iIntents and utterances and how they relate to | 90 Minutes | Student Worksheet Lesson Plan |

| | | smart chat bots. They will use them to start programming their smartbot. | | |
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| 6 | Large Language Models | Students will learn how Large Language Model (LLM) chatbots are created and use a deciphering tool to understand how chatbots use probability and options to generate their responses. | 45 Minutes | Student Worksheet<br>Lesson Plan |
| 7 | Creating Smart Chatbots | Students will create their own chatbot using the skills learned in previous sections of the unit. | 90 Minutes | Student Worksheet<br>Lesson Plan |
| 8 | Biases in Chatbots | Students will understand that biases exist in chatbots that are a result of either their data set or the programmer creating them. | 90 Minutes | Student Worksheet – Biases<br>Student Worksheet – Ethics<br>Lesson Plan |
| 9 | Career Connections | Students will explore the career options that are associated with AI and chatbots. | 60 Minutes | Student Worksheet<br>Lesson Plan |

## 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 for students who need more time, or for students who wish to explore all the extension activities.
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- The unit can be spread out over a longer period for students who need more time, or for students who wish to explore all the extension activities.
- Student choice is embedded throughout the unit to appeal to a variety of interests.