CANADA LEARNING CODE

Alexa, How Might We..?

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Duration: 90 minutes

LEVEL	SUBJECTS	PROVINCES / TERRITORIES	TOOL
Grades 4-6, 7-8	Social Studies, Science + Technology, Applied Design, Skills, and Technologies	Across Canada	Unplugged

Overview

In this unplugged activity, students will learn about voice assistant technology. They will participate in part of the Design Thinking cycle by problem framing and ideating an Alexa Skill that solves a specific problem.

Prep Work

- Print the example Problem Framing worksheet: http://bit.ly/problem-framing-example
- Print enough copies of the blank Problem Framing worksheet for your class (1 per group of 3-4 students): http://bit.ly/problem-framing-template

Lesson

Created in partnership with Amazon.

Key Coding Concepts

- Algorithms
- Sequence
- Boolean Logic

Terminology

Machine Learning
The ability of a computer to learn from experience, to recognize patterns and adapt as it collects new information.

References

Echo Sim (Alexa Skill Testing Tool):
https://echosim.io/

Hook

Watch the “Amazon Alexa Moments: Sweet Sneak (Amazon Echo Commercial)” video: https://vimeo.com/281407171

MIT Technology Review article by George Anders https://www.technologyreview.com/s/608571/alexa-understand-me/

Design Thinking for Open Research and Education, created by Lorraine Chuen bit.ly/DTOpen

Problem Framing example created by Lorraine Chuen

Introduction

Ask: What is “voice assistant” technology?
A: Technology that ‘assists’ or helps us, which we can interact with using our voice.

Voice assistants like Alexa use voice recognition, speech synthesis, and natural language processing (NLP) to understand what we are saying. The more time Alexa spends talking to people, the more information she can collect and learn from. This is called machine learning!

Voice assistants can help us with things like checking the weather, reading recipes, and ordering pizza. When connected to smart-home devices, they can even change the temperature, turn off the lights, or make a cup of coffee!

Voice assistant technology is innovative because it uses technology in a new way to help solve problems. It can help with productivity, accessibility, organization, and more.

Why learn about Voice Assistants?
This is a growing technology with so many possibilities! We can use voice assistants as a tool to solve problems and make our world a better place for everyone. For example, using Alexa to support those impacted by Hurricane Florence.

How does Alexa work?
Alexa uses boolean logic: true or false. We can teach Alexa to do something IF a condition is true, or something else IF the condition is false. All of Alexa’s decisions are framed using these IF statements (or conditional statements).

Ask Alexa some questions to get a better idea of how she works:

- Open up the Echo Sim: https://echosim.io/ - You may need to grant permissions for the website to access your microphone.
  (or use a physical device, if you have one)

- Hold down the microphone icon and say, “Alexa…”
- Then ask her a question, such as:
    - “What is the weather today in Halifax?”
    - “Who invented the goalie mask?”
    - “What is Canada’s national animal?”

*Note: If the Echo Sim is not working, try restarting your computer and trying again, or skip to the main activity and try again later.

Activity

Alexa Skills are programs that teach Alexa how to do something. Today, we are going to use creativity and innovative thinking to ideate an Alexa Skill that solves a specific problem.

<u>Problem Framing</u>
We first need to understand who is affected by a problem, and which challenges they are facing before trying to solve the problem.

Use the example Problem Framing worksheet (attached) to go through an example exercise together.

1. On an anchor chart paper, write: “**How might we** encourage people to recycle more often?”
2. Divide the paper into 4 parts with one the 4 Cs written in each corner (see worksheet)
3. Using the example worksheet, explain what each word means, and work with the group to write 3-4 points in each section. Have the class guide what you are writing, but feel free to use the example points to facilitate discussion if learners need more guidance.
4. Think-Pair-Share: *Based off of our findings, how could we use Alexa to solve this problem?* Remember: Our solution can be as wild as we like! Even if a feature doesn’t exist yet, that doesn’t mean it won’t be possible in the future. (Have learners write down ideas, share with a partner, then share their solutions with the class)
5. Write down a possible solution shared in class at the bottom of the chart paper (try to combine ideas and decide on one solution as a class).
6. How will this idea help solve our identified issues? What are some constraints?

Split learners into groups of 3-4. Each group will choose a new problem and work to complete a 4 Cs worksheet together. Write a few more examples on the board before groups begin.

Examples:

How might we...

- Make studying more fun for students?
- Help someone with memory loss stay on top of important tasks, like buying groceries, or paying bills?
- Train students for new jobs, like babysitting for a new family?
- Support independent living for individuals with acquired brain injuries?
- Help students manage their time between school, clubs, and everything else?

Assessment

Have groups share an overview of their worksheet with the class, including their proposed solution, how it solves their identified challenges, and any additional constraints or considerations.

Learning Outcomes

I can use technology as a problem-solving tool
I can use problem framing to try to understand the context of a problem
I can work with others to find creative solutions to problems
I can communicate with computers using tools like the Echo simulator

Extensions

- Provide time for learners to explore the "Amazon Alexa Skills Challenge: Tech for Good" submissions as inspiration for their own Alexa Skill idea: alexatechforgood.devpost.com/submissions
- This is only part of the Design Thinking cycle. Continue using this awesome Design Thinking resource: bit.ly/DTOpen
- Create working prototypes using Alexa Skill Blueprints: blueprints.amazon.com (parental permission required) - then test it out with the Echo Sim: echosim.io
- Use the Echo Sim in an "Ask three, then me" model, where learners are encouraged to ask other students - or Alexa! - before asking the teacher a question.

PROBLEM FRAMING WORKSHEET

NAMES: _____
_____

How Might We... encourage people to recycle more often?

COMPONENTS

What are the parts of the problem?

→ Local city-level policies
→ Citizen behaviour
→ Ease of recycling
→ Recycling literacy among public

CHARACTERS

Who are the people involved and/or affected?

→ Municipal government
→ Local Waste Management
→ Citizens / General Public
→ Manufacturers

CHALLENGES

What are the key barriers and issues in the problem?

→ It's too easy to throw things in the garbage.
→ People don't care.
→ People don't know what can and can't be recycled

CHARACTERISTICS

(of desired outcome)
What characteristics should the solution have?

→ Reduced waste
→ Increased recycling usage
→ Cleaner city

Proposed Solution:

→ Create an Alexa Skill that has information on recycling rules per city
→ Users can ask "Alexa, where does my ___ go?"
→ Alexa will help determine by asking questions (e.g. Is there a recycling symbol? What number is beside the symbol?)
→ Smart home incorporation: A smart garbage that detects the material of items thrown in the trash and notifies Alexa when an item does not belong - which triggers Alexa to say "This item can be recycled! Try [this bin]."
→ Incorporate a reward system where users gain points to use on Amazon?

PROBLEM FRAMING WORKSHEET

NAMES: _____
_____

How Might We...

COMPONENTS
What are the parts of the problem?

CHARACTERS
Who are the people involved and/or affected?

CHALLENGES
What are the key barriers and issues in the problem?

CHARACTERISTICS
(of desired outcome)
What characteristics should the solution have?

Proposed Solution: