

Lesson 6: Intellectual Property

45 minutes

Overview

What is the balance between intellectual property and algorithmic accountability?

Students explore the ethical and social implications of intellectual property by analyzing and discussing real-world applications of algorithmic decision-making. Students learn why algorithms should be held accountable and regulated through audits and reflect on whether they would want their code to be audited.

Standards

Full Course Alignment

CSA Conceptual Framework

- **IOC-1** - While computing innovations are typically designed to achieve a specific purpose, they may have unintended consequences.

Agenda

Warm Up (5 minutes)
Decision Making

Activity (35 minutes)
Algorithms
Accountability

Wrap Up (5 minutes)
Three W's
Assessment: Check for Understanding

Objectives

Students will be able to:

- Explain why algorithms should be held accountable and regulated through audits
- Identify ethical and social implications of intellectual property

Preparation

- Print copies of the Algorithms handout (one for each student)
- Check the **Teacher's Lounge** for verified teachers on the CSA Forum to find additional strategies or resources shared by fellow teachers

Links

Heads Up! Please make a copy of any documents you plan to share with students.

For the students

- **Algorithms** - Handout
- **U7L6 Extra Practice** - Handout

Vocabulary

- **intellectual property** - a creative work or invention that is protected by copyright laws

Teaching Guide

Warm Up (5 minutes)

Decision Making

Remarks

In a previous unit, we learned how machine learning requires lots of data. Machine learning is often used to make predictions and decisions using algorithms to analyze data.

 **Discuss:** Use the Retrieve-Pair-Share strategy to discuss the prompt.

- *When have you written code to make decisions? What type of code did you use?*

Discussion Goal: Students share examples of decisions they implemented in their programs, such as a `Painter` object choosing whether or not to move forward or paint in The Neighborhood. Students note using conditionals and iteration to make decisions.

 **Discuss:** Use the Retrieve-Pair-Share strategy to discuss the prompt.

- *Think about a time when an app has made a decision for you. Do you know how the code made that decision? Should you be able to know?0*


Discussion Goal: Students suggest examples of decisions made by apps, such as recommending a song or product, choosing what appears at the top of a social media feed, or what to watch next. Students may realize that they do not know how the code made these decisions and suggest whether or not they should know.


Activity (35 minutes)

Algorithms (20 minutes)


Remarks

Legal issues and concerns often arise when creating programs, so companies often protect their code as intellectual property. Intellectual property is a creative work or invention that is protected by copyright laws. This includes copyrights, patents, trade secrets, and trademarks.

 **Do This:** Review the lesson objectives.

 **Do This:** Define intellectual property.

Group: Place students in pairs.

 **Distribute:** Give each student a copy of the Algorithms handout.

 **Do This:** Review the instructions for the Algorithms activity.

 **Discuss:** Click through the animated slide to display the prompts.


- *Which parts of society did you list in the intellectual property column?*
- *Which parts of society did you list in the accountability column?*


Discussion Goal: Students share the parts of society they identified in the intellectual property and accountability columns, such as algorithms involving healthcare or the justice system should be audited, while other code may be protected as intellectual property.

Accountability (15 minutes)

Remarks

As companies protect their algorithms as intellectual property, activists want to audit programs that use artificial intelligence and machine learning to hold them accountable.

 **Do This:** Play the clip about NYC algorithm audits.

 **Discuss:** Click through the animated slide to display the prompts. Use the Retrieve-Pair-Share strategy to discuss the prompts.

- *Should there be more regulation of tech, including algorithm audits?*
- *What are the advantages and disadvantages of regulation?*
- *Do you want your code to be audited? Do you think it should be intellectual property?*


Discussion Goal: Students share their ideas about whether or not there should be regulations. Students suggest advantages and disadvantages of regulation, such as ensuring algorithms do not cause harm in their decisions and that regulations may slow the innovation process. Students share whether or not they would want their code to be audited and their thoughts on their code being intellectual property.

Wrap Up (5 minutes)

Three W's

Remarks

There are a lot of researchers studying the accountability of algorithms. Let's meet one of them!

 **Do This:** Read the biography of Timnit Gebru to the class.

Teaching Tip

If time permits, you can also choose to listen to **this podcast**. Have students share their reactions and thoughts about the work she is doing.

 **Discuss:** Click through the animated slide to display the prompts.

- *What did we learn today?*
- *So what?*
- *Now what?*

Discussion Goal: Students share the concepts they learned from the lesson, including intellectual property and accountability. Students suggest what they might want to do differently in their lives.

 **Do This:** Review the concepts covered in this lesson.

 **Display:** Key Vocabulary

Assessment: Check for Understanding

Check For Understanding Question(s) and solutions can be found in each lesson on Code Studio. These questions can be used for an exit ticket.



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