# AI Ready Skills

## AI Ready Skills Integration in Washington - Mathematics

### Overview

AI Ready Skills offers a dynamic and standards-aligned approach to teaching mathematics through artificial intelligence concepts. It supports Washington State's emphasis on data literacy, algorithmic thinking, and real-world problem-solving, while engaging students in immersive learning environments in Minecraft Education.

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### Credential Units Overview

- **Unit 1: Introduction to AI** – What AI is and is not, types of AI, history, and problem-solving.
- **Unit 2: Exploring Data and AI** – Machine learning, data importance, real-world applications.
- **Unit 3: Coding and AI** – Programming for AI, data collection, and algorithm design.
- **Unit 4: Practicing Responsible AI** – Ethics, fairness, bias, and responsible use of AI.

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### Washington State Mathematics Standards Alignment

The integration aligns with the **Washington State K–12 Learning Standards for Mathematics**, which emphasize:

- **Data Science and Analysis**: Students explore data patterns and use statistical reasoning.
- **Algorithmic Thinking**: Students develop and apply algorithms to solve problems.
- **Mathematical Modeling**: Students simulate real-world scenarios using mathematical tools.
- **Standards for Mathematical Practice**: Including reasoning abstractly, constructing viable arguments, and using appropriate tools strategically.

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## Implementation Tips

- This curriculum is suitable for middle school Mathematics.
- AI Ready Skills uses **Minecraft Education** to create immersive learning environments.
- AI Ready Skills focuses on Human-Centered AI thinking:
    - Begin with human inquiry.
    - Use AI tools to explore and analyze.
    - End with human reflection and insight. This approach ensures ethical, inclusive, and responsible use of AI in classrooms.
- Connect AI to Real-World Applications:
    - Encourage students to explore how AI affects careers, media, and society.
    - Use case studies and current events to spark discussion.
    - Promote digital citizenship and ethical reasoning.
- Support differentiated instruction:
    - Use student-led pacing for independent learners.
    - Offer teacher-led structure for guided exploration.
    - Include extension activities for advanced learners or remediation.
- Includes formative activities and a capstone credential exam.
- Practice exams and lesson quizzes to help students prepare for the Capstone exam.
- AI Ready Skills is flexible. Customize projects and activities to fit your curriculum. Adjust activity topics to match the material you are covering.
- If you need help getting started, we offer free Certified Educator courses, *Getting Started Guide*, Webinars, and experienced product specialists.
- Utilize instructor resources. Access lesson plans, slide decks, answer keys and assessments in the AI Ready Skills portal.

## AI Ready Skills Integration in Mathematics – Unit 1

| AI Ready Skills Unit, Lesson | Example Activities | WA Standards Practiced | Instructional Hours |
|---|---|---|---|
| Unit 1, Lesson 1: What is Artificial Intelligence? | • AI Detective Student Activity<br>• AI or Not AI | • CCSS.MATH.PRACTICE.MP2<br>• CCSS.MATH.PRACTICE.MP3 | 4 Hours |
| Unit 1, Lesson 3: Types of AI | • AI Brainstorming Student Activity | • CCSS.MATH.CONTENT.6.SP.B.4<br>• CCSS.MATH.PRACTICE.MP3 | 5 Hours |


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| AI Ready Skills Unit, Lesson | Example Activities | WA Standards Practiced | Instructional Hours |
|---|---|---|---|
| | • AI Handshake Algorithm Student Activity<br>• Generative AI Student Activity | | |
| Unit, Lesson 4: Solving Problems with AI | • AI Problem Solving Challenge<br>• Create Your Own AI Assistant | • CCSS.MATH.PRACTICE.MP1<br>• CCSS.MATH.PRACTICE.MP6<br>• CCSS.MATH.PRACTICE.MP7 | 3 Hours |

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**Washington State Science Standards Alignment**

The following standards are directly supported by AI Ready Skills activities and credential units:

**Unit 1, Lesson 1: What is Artificial Intelligence?**

- **CCSS.MATH.PRACTICE.MP2:** Reason abstractly and quantitatively.
- **CCSS.MATH.PRACTICE.MP3:** Construct viable arguments and critique the reasoning of others.

**Lesson 1 Connections to Washington Standards**

AI Detectives Student Activity

- Students are presented with a set of statements and must identify which one is correct.
- Students use AI tools to investigate and verify information.

AI or Not AI Student Activity

- Students examine various examples and determine whether each qualifies as AI.

**Unit 1, Lesson 2: History of AI**

- **CCSS.MATH.CONTENT.6.SP.B.4:** Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
- **CCSS.MATH.PRACTICE.MP3:** Construct viable arguments and critique the reasoning of others.


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**Lesson 2 Connections to Washington Standards**

AI History Timeline

- Students organize events along a timeline, which serves as a visual representation of data over time—functioning similarly to a number line.
- Students write concise descriptions for each event, explaining its significance.

**Unit 1, Lesson 3: Types of AI**

- **CCSS.MATH.PRACTICE.MP3:** Construct viable arguments and critique the reasoning of others.
- **CCSS.MATH.PRACTICE.MP6:** Attend to precision.
- **CCSS.MATH.PRACTICE.MP7:** Look for and make use of structure**.**
- **CCSS.MATH.PRACTICE.MP1:** Make sense of problems and persevere in solving them.
- **CCSS.MATH.CONTENT.6.SP.B.5:** Summarize numerical data sets in relation to their context.

**Lesson 3 Connections to Washington Standards**

AI Handshake Algorithm Activity

- Students break down a handshake into sequential steps, recognizing and applying structured logic—similar to how mathematical procedures are built.
- Students revise their algorithms to be more precise and clearer, mirroring the importance of precision in mathematical communication.
- Students analyze why instructions may have failed and improve them, demonstrating perseverance and problem-solving.

AI in Action Using Tools Responsibly Reflection

- Students consider why instructions to AI must be detailed and specific, connecting to the need for precision in math.

Predictive AI Student Activity

- Students analyze grade and stock price data, summarize trends, and make predictions—applying mathematical reasoning to real-world data.
- Students justify their predictions and discuss what additional data would improve accuracy, engaging in mathematical argumentation and critique.

**Unit 1, Lesson 4: Solving Problems with AI**

- **CCSS.MATH.PRACTICE.MP1:** Make sense of problems and persevere in solving them.
- **CCSS.MATH.PRACTICE.MP5:** Use appropriate tools strategically**.**
- **CCSS.MATH.PRACTICE.MP7:** Look for and make use of structure.


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**Lesson 4 Connections to Washington Standards**

AI Problem Solving Challenge

- Students analyze how AI uses data to detect patterns and anomalies, reasoning about environmental impacts.
- Students break down the problem and solution into components, using structure in their reasoning and solution design.
- Students consider what data and technology are needed, choosing appropriate tools and methods for their solution.

**AI Ready Skills Integration in Mathematics – Unit 2**

| AI Ready Skills Unit, Lesson | Example Activities | WA Standards Practiced | Instructional Hours |
|---|---|---|---|
| Unit 2, Lesson 5: Machine Learning and Data | • Mapping Terrain Minecraft World and Reflection<br>• Mapping Terrain Student Activity<br>• Who is that Ocelot World and Reflection<br>• Machine Learning Research Project | • CCSS.MATH.PRACTICE.MP1<br>• CCSS.MATH.PRACTICE.MP2<br>• CCSS.MATH.PRACTICE.MP3<br>• CCSS.MATH.PRACTICE.MP4<br>• CCSS.MATH.PRACTICE.MP7 | 7 Hours |
| Unit 2, Lesson 6: Real-World Applications of AI | • Self-Driving Car Diagram & Student Activity<br>• AI-Powered Farm<br>• AI-Powered Learning Platform Exploration | • CCSS.MATH.PRACTICE.MP1<br>• CCSS.MATH.PRACTICE.MP3<br>• CCSS.MATH.PRACTICE.MP4<br>• CCSS.MATH.PRACTICE.MP5 | 8 Hours |


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**Washington State Science Standards Alignment**

The following standards are directly supported by AI Ready Skills activities and credential units:

**Unit 2, Lesson 5: Machine Learning and Data**

- **CCSS.MATH.PRACTICE.MP1:** Make sense of problems and persevere in solving them.
- **CCSS.MATH.PRACTICE.MP2:** Reason abstractly and quantitatively.
- **CCSS.MATH.PRACTICE.MP3:** Construct viable arguments and critique the reasoning of others.
- **CCSS.MATH.PRACTICE.MP4:** Model with mathematics.
- **CCSS.MATH.PRACTICE.MP7:** Look for and make use of structure.

**Lesson 5 Connections to Washington Standards**

Mapping Terrain Reflection

- Students analyze how AI uses data to detect patterns and anomalies, reasoning about environmental impacts.

Who is that Ocelot? Reflection

- Students explore how AI uses pattern recognition and consider the structure of data and bias in datasets.
- Students justify how tracking species helps conservation and critique the reasoning behind AI applications.

Mapping Terrain Student Activity

- Students record and reflect on each step of the machine learning process, making sense of how AI learns.
- Students model the machine learning process and its components, relating them to mathematical modeling.

Machine Learning Research Project

- Students research, present, and defend their findings on AI applications, constructing arguments and critiquing evidence.
- Students code and analyze datasets, recognizing and using structure in data and algorithms.

**Unit 2, Lesson 6: Real-World Applications of AI**

- **CCSS.MATH.PRACTICE.MP1:** Make sense of problems and persevere in solving them.
- **CCSS.MATH.PRACTICE.MP3:** Construct viable arguments and critique the reasoning of others.
- **CCSS.MATH.PRACTICE.MP4:** Model with mathematics.
- **CCSS.MATH.PRACTICE.MP5:** Use appropriate tools strategically.


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**Lesson 6 Connections to Washington Standards**

AI Powered Farm

- Students brainstorm, research, and design solutions for farm management, demonstrating problem-solving and perseverance.
- Students create visual models of farm layouts and AI technologies, representing abstract concepts concretely.

AI Powered Learning Platform Exploration

- Students analyze and present how AI personalizes education, constructing arguments and critiquing evidence.

Self-Driving Cars Student Activity

- Students label and explain how sensors, algorithms, and decision-making work together, modeling real-world systems.
- Students use diagrams, research, and digital tools to communicate how AI enables self-driving capabilities**.**

**AI Ready Skills Integration in Science – Unit 3**

| **AI Ready Skills Unit, Lesson** | **Example Activities** | **WA Standards Practiced** | **Instructional Hours** |
|---|---|---|---|
| Unit 3, Lesson 7: Coding in AI | • Student Tic Tac Toe Algorithm Activity<br>• Agent Build Near Player Coding Steps<br>• Agent Collect Gold Coding Steps<br>• Build an AI in Minecraft Student Activity<br>• Data Collection Student Activity | • CCSS.MATH.PRACTICE.MP1<br>• CCSS.MATH.PRACTICE.MP2<br>• CCSS.MATH.PRACTICE.MP3<br>• CCSS.MATH.PRACTICE.MP4<br>• CCSS.MATH.PRACTICE.MP5<br>• CCSS.MATH.PRACTICE.MP6<br>• CCSS.MATH.PRACTICE.MP7 | 5 Hours |
| Unit 3, Lesson 8: AI Projects | • AI Research Project | • CCSS.MATH.PRACTICE.MP2 | 5 Hours |


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## Washington State Science Standards Alignment

The following standards are directly supported by AI Ready Skills activities and credential units:

### Unit 3, Lesson 7: Machine Learning and Data

- **CCSS.MATH.PRACTICE.MP1:** Make sense of problems and persevere in solving them.
- **CCSS.MATH.PRACTICE.MP2:** Reason abstractly and quantitatively.
- **CCSS.MATH.PRACTICE.MP3:** Construct viable arguments and critique the reasoning of others.
- **CCSS.MATH.PRACTICE.MP4:** Model with mathematics.
- **CCSS.MATH.PRACTICE.MP5:** Use appropriate tools strategically.
- **CCSS.MATH.PRACTICE.MP6:** Attend to precision.
- **CCSS.MATH.PRACTICE.MP7:** Look for and make use of structure.

### Lesson 7 Connections to Washington Standards

Student Tic Tac Toe Algorithm Activity

- Students reflect on strategies, decision-making, and problem-solving in a game context.
- Students use if-else statements and pseudocode to describe strategies, recognizing patterns and structure.

Agent Build Near Player

- Students use variables, loops, and logic to model building processes in Minecraft, representing mathematical concepts.

Agent Build Near Player Coding Steps

- Students use variables, loops, and logic to model building processes in Minecraft, representing mathematical concepts.

AI Algorithm Student Activity

- Students follow precise steps in sorting, analyze efficiency, and reflect on algorithmic accuracy.

Build an AI in Minecraft Student Activity

- Students plan, code, and evaluate AI agents, reasoning about data, logic, and quantitative performance.


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Data Collection Student Activity

- Students design AI ideas, identify data needs, and plan collection methods, modeling real-world systems.
- Students consider reliability, challenges, and ethical issues, constructing arguments and critiquing reasoning.

**Unit 3, Lesson 8: Machine Learning and Data**

- **CCSS.MATH.PRACTICE.MP2:** Reason abstractly and quantitatively.

**Lesson 8 Connections to Washington Standards**

AI Research Project

- Students analyze how AI models work, what data they use, and their real-world applications, reasoning about abstract and quantitative aspects.

**AI Ready Skills Integration in Science – Unit 4**

| AI Ready Skills Unit, Lesson | Example Activities | WA Standards Practiced | Instructional Hours |
|---|---|---|---|
| Unit 4, Lesson 9: What are Ethics? | • Ethics in AI Case Studies | • CCSS.MATH.PRACTICE.MP2<br>• CCSS.MATH.PRACTICE.MP4 | 5 Hours |
| Unit 4, Lesson 10: | • Bias and Fairness Comic Strip<br>• Explore Inclusiveness in AI<br>• Bias Detective | • CCSS.MATH.PRACTICE.MP3<br>• CCSS.MATH.PRACTICE.MP7 | 6 Hours |
| Unit 4, Lesson 11: | • Privacy Poster Campaign<br>• AI Security Breach Case Analysis | • CCSS.MATH.PRACTICE.MP7 | 4 Hours |


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**Washington State Science Standards Alignment**

The following standards are directly supported by AI Ready Skills activities and credential units:

**Unit 4, Lesson 9: What are Ethics?**

- **CCSS.MATH.PRACTICE.MP2:** Reason abstractly and quantitatively.
- **CCSS.MATH.PRACTICE.MP4:** Model with mathematics**.**

**Lesson 9 Connections to Washington Standards**

Ethics in AI Case Studies

- Students practice data analysis and ethical decision-making, modeling real-world systems and evaluating impacts.

Fantastic Fairgrounds Reflection

- Students explain AI concepts, relate data analysis to AI, and consider ethical and societal impacts, reasoning about abstract and quantitative aspects.

**Unit 4, Lesson 10: AI Bias, Fairness, and Inclusiveness**

- **CCSS.MATH.PRACTICE.MP3:** Construct viable arguments and critique the reasoning of others.
- **CCSS.MATH.PRACTICE.MP7:** Look for and make use of structure.

**Lesson 10 Connections to Washington Standards**

Bias and Fairness Comic Strip

- Students identify and apply strategies (diverse datasets, transparency, feedback) to reduce bias and promote fairness in AI.

Bias Detective

- Students identify bias in datasets, discuss impacts, and propose solutions, constructing and critiquing arguments.

**Unit 4, Lesson 11: Privacy and Security**

- **CCSS.MATH.PRACTICE.MP1:** Make sense of problems and persevere in solving them.

**Lesson 11 Connections to Washington Standards**

AI Security Breach Case Analysis

- Students analyze case studies, identify security risks, and propose solutions, demonstrating perseverance in problem-solving.


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