Computer Science I-A & I-B

Grades 9-12

Computer Science 1 in Carbon County School District #2 will be using Computer Science Discoveries at Code.org. This is an introductory computer science course that empowers students to create authentic projects through hands on labs and engage with computer science as a medium for creativity, communication, problem solving, and fun.

Semester One Outline

UNIT 1 - PROBLEM SOLVING AND COMPUTING ('22-'23)

Lesson 1: Intro to Problem Solving

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & AP.PD Program Development**
    - L1.AP.A.01 - Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student.
    - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.
    - L1.AP.PD.01 - Plan and develop programs by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users.

Lesson 2: The Problem Solving Process

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms**
    - L1.AP.A.01 - Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student.
    - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.

Lesson 3: Exploring Problem Solving

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & AP.PD Program Development**
    - L1.AP.A.01 - Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student.
    - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.

    - L1.AP.PD.01 - Plan and develop programs by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users.

Lesson 4: What is a Computer?

Wyoming - 2019 Computer Science Content Standards (K-12)

- **CS.T Trouble Shooting**
    - L2.CS.T.01 - Identify how hardware components facilitate logic, input, output, and storage in computing systems, and their common malfunctions.

Lesson 5: Input and Output

Wyoming - 2019 Computer Science Content Standards (K-12)

- **CS**.T Trouble Shooting & CS.HS Hardware & Software
    - L2.CS.T.01 - Identify how hardware components facilitate logic, input, output, and storage in computing systems, and their common malfunctions.
    - L1.CS.HS.01 - Explain the interactions between application software, system software, and hardware layers.

Lesson 6: Processing

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L2.AP.PD.08 - Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
- **CS**.T Trouble Shooting & CS.HS Hardware & Software
    - L2.CS.T.01 - Identify how hardware components facilitate logic, input, output, and storage in computing systems, and their common malfunctions.
    - L1.CS.HS.01 - Explain the interactions between application software, system software, and hardware layers.

Lesson 7: Storage

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L2.AP.PD.08 - Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.
- **IC.C Culture**
    - L2.IC.C.03 - Predict how computational innovations that have revolutionized aspects of our culture might evolve.

Lesson 8: Project - Propose an App

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L2.AP.PD.08 - Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.
    - L1.AP.PD.06 - Evaluate and refine computational artifacts to make them more usable and accessible.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
- **DA. Storage**
    - L1.DA.S.02 - Evaluate the trade-offs in how data elements are organized and where data is stored.

Lesson 9: Intro to Problem Solving - Newspaper Table (Alternate Lesson 1)

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & AP.PD Program Development**
    - L1.AP.A.01 - Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student.
    - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.
    - L1.AP.PD.01 - Plan and develop programs by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users.

Lesson 10: Intro to Problem Solving - Spaghetti Bridge (Alternate Lesson 1)

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & AP.PD Program Development**
    - L1.AP.A.01 - Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student.
    - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.
    - L1.AP.PD.01 - Plan and develop programs by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users.

Lesson 11: Intro to Problem Solving - Paper Tower (Alternate Lesson 1)

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & AP.PD Program Development**
    - L1.AP.A.01 - Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student.

- L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.
- L1.AP.PD.01 - Plan and develop programs by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users.

Lesson 12: Exploring Problem Solving - Animals Theme (Alternate Lesson 3)

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & AP.PD Program Development**
  - L1.AP.A.01 - Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student.
  - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.
  - L1.AP.PD.01 - Plan and develop programs by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users.

Lesson 13: Exploring Problem Solving - Games Theme (Alternate Lesson 3)

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & AP.PD Program Development**
  - L1.AP.A.01 - Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student.
  - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.
  - L1.AP.PD.01 - Plan and develop programs by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users.

UNIT 2 - WEB DEVELOPMENT ('22-'23)

Lesson 1: Exploring Web Pages

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.C Control**
  - L1.AP.C.03 - Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.

Lesson 2: Intro to HTML

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.C Control**
    - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.

Lesson 3: Headings

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & AP.PD Program Development**
    - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.
    - L1.AP.PD.03 - Use debugging tools to identify and fix errors in a program.

Lesson 4: Mini-Project: HTML Web Page

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & AP.PD Program Development**
    - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.
    - L2.AP.PD.07 - Modify an existing program to add additional functionality and discuss intended and unintended implications (e.g., breaking other functionality).
    - L1.AP.PD.03 - Use debugging tools to identify and fix errors in a program.

Lesson 5: Digital Footprint

Wyoming - 2019 Computer Science Content Standards (K-12)

- **NI.C Cybersecurity & IC.SLE Safety, Law, & Ethics**
    - L1.NI.C.04 - Explain trade-offs when selecting and implementing cybersecurity recommendations.
    - L1.IC.SLE.02 - Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users.
- **NI.C Cybersecurity**
    - L1.NI.C.03 - Compare various security measures, considering trade-offs between the usability and security of a computing system.

Lesson 6: Styling Text with CSS

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 7: Mini-Project: Your Personal Style

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 8: Intellectual Property

Wyoming - 2019 Computer Science Content Standards (K-12)

- **IC.C Culture**
    - L2.IC.C.01 - Evaluate the beneficial and harmful effects that computational artifacts and innovations have on society.
- **IC.SI Social Interactions**
    - L2.IC.SI.01 - Practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior.
    - L1.NI.C.02 - Recommend cybersecurity measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts.

Lesson 9: Using Images

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development & IC.C Culture**
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L2.IC.C.01 - Evaluate the beneficial and harmful effects that computational artifacts and innovations have on society.
- **IC.SI Social Interactions & IC.SLE Safety, Law, & Ethics**
    - L2.IC.SI.01 - Practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior.
    - L1.IC.SLE.02 - Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users.

Lesson 10: Websites for Expression

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.M Modularity & IC.C Culture**
    - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
- **IC.C Culture**
    - L2.IC.C.02 - Evaluate the impact of equity, access, and influence on the distribution of computing resources in a global society.

Lesson 11: Styling Elements with CSS

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 12: Your Web Page - Prepare

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 13: Project - Personal Web Page

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L1.AP.PD.06 - Evaluate and refine computational artifacts to make them more usable and accessible.
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
- **IC.SI Social Interactions**
    - L2.IC.SI.01 - Practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior.

Lesson 14: Websites for a Purpose

Wyoming - 2019 Computer Science Content Standards (K-12)

- **IC.C Culture**
    - L2.IC.C.03 - Predict how computational innovations that have revolutionized aspects of our culture might evolve.

Lesson 15: Team Problem Solving

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**

    - L1.AP.PD.06 - Evaluate and refine computational artifacts to make them more usable and accessible.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
- **IC.C Culture & IC.SI Social Interactions**
    - L2.IC.C.03 - Predict how computational innovations that have revolutionized aspects of our culture might evolve.
    - L1.IC.SI.02 - Practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior.

Lesson 16: Sources and Research

Wyoming - 2019 Computer Science Content Standards (K-12)

- **IC.C Culture & IC.SLE Safety, Law, & Ethics**
    - L2.IC.C.03 - Predict how computational innovations that have revolutionized aspects of our culture might evolve.
    - L1.IC.SLE.01 - Explain the beneficial and harmful effects that intellectual property laws can have on innovation.
    - L1.IC.SLE.03 - Evaluate the social and economic implications of privacy in the context of safety, law, or ethics.

Lesson 17: CSS Classes

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 18: Planning a Multi-Page Site

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms & IC.SLE Safety, Law, & Ethics & AP.PD Program Development**
    - L2.AP.A.03 - Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency, correctness, and clarity.
    - L1.IC.SLE.04 - Using grade level appropriate content and complexity, discuss the legal, social, and ethical impacts associated with software development and use, including both positive and malicious intent.

    - L1.AP.PD.01 - Plan and develop programs by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users.
    - L2.AP.PD.03 - Develop programs for multiple computing platforms.
    - L1.AP.PD.06 - Evaluate and refine computational artifacts to make them more usable and accessible.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
- **IC.C Culture & IC.SI Social Interactions**
    - L2.IC.C.01 - Evaluate the beneficial and harmful effects that computational artifacts and innovations have on society.
    - L2.IC.SI.01 - Practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior.

Lesson 19: Linking Pages

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
    - L2.AP.PD.07 - Modify an existing program to add additional functionality and discuss intended and unintended implications (e.g., breaking other functionality).
    - L1.AP.PD.06 - Evaluate and refine computational artifacts to make them more usable and accessible.
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
- **IC** - Impacts of Computing
    - L2.IC.SI.01 - Practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior.

Lesson 20: Project - Website for a Purpose

Wyoming - 2019 Computer Science Content Standards (K-12)

- AP.PD Program Development
    - L1.AP.PD.06 - Evaluate and refine computational artifacts to make them more usable and accessible.
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.

- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 21: Peer Review and Final Touches

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.PD Program Development**
  - L1.AP.PD.06 - Evaluate and refine computational artifacts to make them more usable and accessible.
  - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

UNIT 3 - INTERACTIVE ANIMATIONS AND GAMES ('22-'23)

Lesson 1: Programming for Entertainment

Wyoming - 2019 Computer Science Content Standards (K-12)

- **IC.SLE Safety, Law, & Ethics**
  - L1.IC.SLE.01 - Explain the beneficial and harmful effects that intellectual property laws can have on innovation.

Lesson 2: Plotting Shapes

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.A Algorithms**
  - L2.AP.PD.08 - Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.

Lesson 3: Drawing in Game Lab

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.M Modularity & AP.PD Program Development**
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 4: Shapes and Parameters

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.M Modularity & AP.PD Program Development**
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 5: Variables

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 6: Random Numbers

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 7: Sprites

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.

- L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
- L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
- L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 8: Sprite Properties

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 9: Text

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.C Control & AP.M Modularity & AP.PD Program Development**
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 10: Mini-Project - Captioned Scenes

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.

- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 11: The Draw Loop

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 12: Sprite Movement

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 13: Mini-Project - Animation

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

- L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 14: Conditionals

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.C Control & AP.M Modularity & AP.PD Program Development**
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 15: Keyboard Input

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 16: Mouse Input

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.

- L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 17: Project - Interactive Card

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L1.AP.PD.06 - Evaluate and refine computational artifacts to make them more usable and accessible.
  - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 18: Velocity

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 19: Collision Detection

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
    - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
    - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
    - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.

Lesson 20: Mini-Project - Side Scroller

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
    - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
    - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
    - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.

Lesson 21: Complex Sprite Movement

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
    - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
    - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
    - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 22: Collisions

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
    - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
    - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
    - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 23: Mini-Project - Flyer Game

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
    - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
    - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
    - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
    - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
    - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 24: Functions

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & CS.T Troubleshooting & AP.PD Program Development**
    - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
    - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
    - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
    - L1.CS.T.01 - Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and resolve errors.
    - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.

- L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 25: The Game Design Process

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 26: Using the Game Design Process

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**
  - L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
  - L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
  - L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
  - L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
  - L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
  - L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Lesson 27: Project - Design a Game

Wyoming - 2019 Computer Science Content Standards (K-12)

- **AP.V Variables & AP.C Control & AP.M Modularity & AP.PD Program Development**

- L2.AP.PD.08 - Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.
- L1.AP.V.01 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
- L1.AP.C.02 - Trace the execution of loops and conditional statements, illustrating output and changes in values of named variables.
- L1.AP.M.01 - Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
- L1.AP.PD.06 - Evaluate and refine computational artifacts to make them more usable and accessible.
- L1.AP.PD.02 - Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
- L2.AP.PD.05 - Develop and use a series of test cases to verify that a program performs according to its design specifications.
- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.
- L1.AP.PD.04 - Design and develop computational artifacts, working in team roles, using collaborative tools.

Semester Two

The Makeblock ultimate 2.0 10-in-1 robot kit will be utilized during the second semester. This is a STEM (Science, Technology, Engineering, and Math) coding robot for students that makes teaching and learning robot coding simple and fun. Students will learn how to design, build, research, and follow instructions to build a robot. Students will also learn and apply a programming language to control the robot to perform various tasks. Through the use of robots students will work to understand and apply the Seven Survival Skills for 21st Century Students:

1. Critical Thinking and Problem Solving.
2. Collaboration Across Networks and Leading By Influence
3. Agility and Adaptability
4. Initiative and Entrepreneurship
5. Effective Oral and Written Communication
6. Accessing and Analyzing Information
7. Curiosity and Imagination

Today's students must be prepared to thrive in a constantly evolving technological landscape. The following ISTE (International Society for Technology in Education) Standards to be covered are designed to empower student voice and ensure that learning is a student-driven process.

1.1 Empowered Learner

· Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.

- 1.1.a - Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
- 1.1.b - Students build networks and customize their learning environments in ways that support the learning process.
- 1.1.c - Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
- 1.1.d - Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

· Aligns with Wyoming - 2019 Computer Science Content Standards (K-12):
  - CS.T Troubleshooting
  - IC.C Culture
  - IC.SI Social Interactions

1.2 Digital Citizen

· Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.

- 1.2.a - Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
- 1.2.b - Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
- 1.2.c - Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
- 1.2.d - Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

· Aligns with Wyoming - 2019 Computer Science Content Standards (K-12):
  - IC.C Culture
  - IC.SI Social Interactions
  - IC.SLE Safety, Law, & Ethics

1.3 Knowledge Constructor

· Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

- 1.3.a - Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
- 1.3.b - Students evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.

- 1.3.c - Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
- 1.3.d - Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

· Aligns with Wyoming - 2019 Computer Science Content Standards (K-12):
  - CS.T Troubleshooting
  - DA.CVT Collection, Visualization, & Transformation
  - IC.C Culture
  - IC.SI Social Interactions

1.4 Innovative Designer

· Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
  - 1.4.a - Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
  - 1.4.b - Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
  - 1.4.c - Students develop, test and refine prototypes as part of a cyclical design process.
  - 1.4.d - Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

· Aligns with Wyoming - 2019 Computer Science Content Standards (K-12):
  - CS.T Troubleshooting
  - DA.CVT Collection, Visualization, & Transformation
  - AP.A Algorithms
  - AP.V Variables
  - AP.C Control
  - AP.PD Program Development

1.5 Computational Thinker

· Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
  - 1.5.a - Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
  - 1.5.b - Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
  - 1.5.c - Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

- 1.5.d - Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

· Aligns with Wyoming - 2019 Computer Science Content Standards (K-12):
  - CS.D Devices
  - CS.HS Hardware & Software
  - CS.T Troubleshooting
  - NI.NCO Network Communication & Organization
  - DA.S Storage
  - DA.CVT Collection, Visualization, & Transformation
  - AP.A Algorithms
  - AP.V Variables
  - AP.C Control
  - AP.PD Program Development

1.6 Creative Communicator

· Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
  - 1.6.a - Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
  - 1.6.b - Students create original works or responsibly repurpose or remix digital resources into new creations.
  - 1.6.c - Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
  - 1.6.d - Students publish or present content that customizes the message and medium for their intended audiences.

· Aligns with Wyoming - 2019 Computer Science Content Standards (K-12):
  - DA.CVT Collection, Visualization, & Transformation
  - AP.A Algorithms
  - AP.V Variables
  - AP.C Control
  - AP.PD Program Development
  - IC.C Culture
  - IC.SI Social Interactions

1.7 Global Collaborator

· Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
  - 1.7.a - Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

- 1.7.b - Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
- 1.7.c - Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- 1.7.d - Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.

- Aligns with Wyoming - 2019 Computer Science Content Standards (K-12):
  - IC.C Culture
  - IC.SI Social Interactions