Teacher-Librarian Lesson Plan
Micro:Bits / Makerspace

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| **LMS Name** | Hodgins |
| **Teacher's Name** | 6,7,8 Makerspace in Library Club<br>Smith - Computer Science, Barkell - Career Pathways |
| **Subject** | LIT, CS |
| **Grade Level** | 6, 7, 8 |
| **Class** | Library Club |
| **Date** | November 2022 |
| **Sessions & Duration** | During Library Club<br>- Ongoing, Drop-in visitors self-paced exploration |
| **Location** | Library Media Centre |
| **Subject Objectives** | Students shall create a computational artifact, using the tools and materials provided, through employing the design cycle.<br><br>Students shall use software and hardware to explore coding, programming, and data analysis. |
| **Information Literacy Objectives** | Students shall work independently or in teams to engage appropriately with tools and materials provided, within the library space.<br><br>Students shall solve problems by employing the design cycle.<br><br>Students shall persist through self-direction in making and tinkering. |

**Standards**

| Content Standards<br>https://edu.wyoming.gov/educators/standards/ | Information Literacy Standards<br>http://www.ala.org/aasl/standards-guidelines/learning-standards |
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| Crosswalk -http://www.ala.org/aasl/standards/crosswalk | |
| Coding<br>***Using a mid-point grade level as an example of standards from 5th-8th grades***<br>**ELA**<br>Research to Build and Present Knowledge.<br><br>W.7.7. Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.<br><br>Comprehension and Collaboration.<br><br>SL.7.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.<br><br>SL.7.1.d. Acknowledge new information expressed by others and, when warranted, modify their own views. | Coding<br><br>**LIT**<br>**AASL**<br>-Inquire/Curate/Explore/Engage<br><br>Learners participate in personal, social, and intellectual networks by: 1. Using a variety of communication tools and resources. 2. Establishing connections with other learners to build on their own prior knowledge and create new knowledge.<br><br>Learners exchange information resources within and beyond their learning community by: 1. Accessing and evaluating collaboratively constructed information sites. 2. Contributing to collaboratively constructed information sites by ethically using and reproducing others' work. 3. Joining with others to compare and contrast information derived from collaboratively constructed information sites<br><br>Learners construct new knowledge by: 1. Problem solving through cycles of design, implementation, and reflection. 2. Persisting through self-directed pursuits by tinkering and making<br><br>Learners develop through experience and reflection by: 1. Iteratively responding to challenges. 2. Recognizing capabilities and skills that can be developed, improved, and expanded. 3. Open-mindedly accepting feedback for positive and constructive growth. |

| Computer Science<br>https://edu.wyoming.gov/wp-content/uploads/2021/04/2020-CS-WYCPS-with-all-PLDs-effective-04.07.21.pdf |
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| Coding<br>**Computer Science**<br>***Using the "end of 8th grade band" to cover lower grades included within plan*** |

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| | *8.CS.HS.01 Design and refine a project that combines hardware and software components to collect and exchange data. [Practice 5.1 Creating Computational Artifacts]<br><br>8.CS.T.01 Systematically identify, resolve, and document increasingly complex software and hardware problems with computing devices and their components. [Practice 6.2 Testing and Refining Computational Artifacts]<br><br>*8.AP.M.01 Using grade appropriate content and complexity, decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs. [Practice 3.2 Recognizing and Defining Computational Problems]<br><br>8.IC.SI.01 Using grade appropriate content and complexity, collaborate using tools to connect with peers when creating a computational artifact. [Practice 2.4 Collaborating Around Computing] [Practice 5.2 Creating Computational Artifacts] |
| **Prerequisite Skills** | Students should have a clear idea of how to follow directions, reading or listening.<br><br>Students shall also need to be able to log on to the computers and to navigate or follow navigation directions to the library website and then to coding websites. |
| **Resources/Materials** | Student Computers with Log-in Instructions<br>Library Website Link<br><br>Instructional Slideshow<br>https://docs.google.com/presentation/d/e/2PACX-1vRhEK5sVI3QbZr-FNAQrHX9kFqnBW_J8hT2qM8qSyxST-42rn_ntsk67O1uG684_LbYNXXP2gikR7um/pub?start=false&loop=false&delayms=3000<br>https://docs.google.com/presentation/d/1BwXWlM1ua0hf1twCqSNbxGYw4AIdLY6eeVlWrNJCkDw/present?usp=sharing<br>Micro:bits with accessories<br><br>Reflection Assessment - Google Form<br><br>Demonstration videos searchable on youtube |
| **Essential Questions** | How is coding related to the design cycle?<br><br>In what ways can we use computing devices to explore our environment?<br><br>In what ways can we use computing devices to communicate and collaborate with other learners?<br><br>How can coding help us express our creativity? |

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| **Procedures** | ● Make Instructional slideshow<br>● Post on library website<br>● Introduce micro:bits with name flashing = “Hello! my name is Mr. Hodgins. :)”<br>● Show students that it is possible to activate other programs through other means (Shake the micro:bit for it to read “ Hello!, My name remains Mr. Hodgins.”<br>● Introduce micro:bits site<br>● Instruct students how to gain access to library website and micro:bits site.<br>● Determine purpose:<br>○ If working in collaboration with Classroom or Computer Science teacher, outline objectives<br>○ If working in Library Club, outline objectives<br>○ If allowing exploration during free periods, allow students to explore the materials and encourage them to share their results<br>● Allow students to explore micro:bits, steering them toward projects appropriate to their present skills<br>● Help troubleshoot<br>● Encourage students to assist peers in troubleshooting<br>● Present projects (progress)<br>● Review and Reflect<br>○ Discuss how designing an algorithm and writing code and making a program are similar to the design cycle.<br>○ Discuss ways to use such tools for communication, collaboration, and creation.<br>○ Instruct students to fill out the Google Form to share their reflections. |
| **Student Assessment** | Remaining on task during independent work and in teams<br><br>Engagement with the design cycle<br><br>Informal presentation of artifacts<br><br>Response to prompts describing their micro:bits exploration.<br><br>Discussion<br><br>Reflection and Review - Google Form |

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| **Teacher / LMS Assessment** | Success of helping students log on to their computers<br><br>Success of students navigating to library website<br><br>Effectiveness of students utilizing the coding tools websites<br><br>Success of students demonstrating persistence in the design cycle<br><br>Engagement with coding and tools during station and free-choice opportunities<br><br>Engagement in discussion and sharing reflections |
| **Critical Thinking Strategies** | Essential Questioning,<br>Graphic Organizers,<br>Group work,<br>Iterization,<br>Experimentation,<br>Project Presentation |
| **Authentic Learning Activities** | Online Resources<br>Inquiry<br>Experimenting<br>Manipulatives<br>Project |
| **Learning Theory** | Problem-based learning<br>Project-based learning |
| **Technological Component** | Library Website & Coding website<br>Electronic Survey<br>Student Computers |
| **Assessment of Technological Component** | Success navigating to library website<br><br>Success utilizing the coding tools - physical and online<br><br>Success utilizing the electronic survey |

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| **Differentiations** | Students may work either independently or in small groups.<br><br>Students may view websites' tutorials.<br><br>Students who finish early could act as peer-tutors.<br><br>Students who require such assistance may have help in composition and manipulation of technological tools.<br><br>Students may use tools such as Snap and Read to have webpage text read audibly.<br><br>Students may explore various possibilities, connections, and extensions of coding |
| **Reflections** | November 2022<br><u>Library Club</u><br>*Session one:*<br>Scheduling difficulties - only a few students attend the morning with a special assembly, and wondering if the library is even open due to absences earlier in the week.<br><br>Still need to walk students through to reach the library website.<br><br>Students were amazed at the nametag in my pocket. Excited to explore for themselves.<br><br>A lot of difficulty getting programs downloaded. Problems solved only as the period is ending.<br><br>*Remember to activate the micro:bits on start-up.<br><br>*Session two:*<br>Much greater success with more students and fewer troubles.<br><br>Explore beyond nametags. (Love Meter; LED Grid; Rock, Paper, Scissors; etc.)<br><br>Engagement with partners, teams, friends.<br><br>Keep asking if they can have them<br>Sorry! |

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| | Drop-in Lunch<br><br>Again, amazed at the name tag hanging from my pocket and excited to explore.<br><br>Asked persistentlyif they can do Python.<br>Strongly advised to start out with Blocks.<br><br>A bit of trouble with downloading until they figure out they must be plugged in all the way.<br><br>Rely on students to help me figure out problems and troubleshoot.<br><br>Once more asking if they can have them.<br>Sorry! |
| **References** | |