Mid Range Project

Content Area: **Computer Science**
Course(s):
Time Period: **Marking Period 2**
Length: **4-6 weeks**
Status: **Published**

Summary

Students will develop a structure in which they will continue learning and building towards their project's end goal. The 4-6 week timeline is designed to set up a plan for how to move forward while leaving flexibility to pivot if something catastrophic occurs down a particular path, what resources will be used and what can be expected within the given timeline. At the end of this block of time, students will present their progress. Pitfalls & how they were overcome, major breakthroughs, and developing the next steps towards their end goal will be adequately defined within these presentations.

Diversity and Inclusion: Students will focus on equity, inclusion, and tolerance when analyzing the comparison of various quantities regarding characteristics of people & resources. Equality will also be highlighted through the topic of digital citizenship. This can be associated with treating people fairly and equally.

English Language Development Standard 4: Language for Science: English language learners communicate information, ideas and concepts necessary for academic success in the content area of science.

Information Literacy: This unit challenges students to locate, evaluate, and use information effectively. Information literacy includes, but is not limited to, digital, visual, media, textual, and technological literacy. Lessons may include the research process and how information is created and produced; critical thinking and using information resources; research methods, including the difference between primary and secondary sources; the difference between facts, points of view, and opinions, accessing peer-reviewed print and digital library resources; the economic, legal, social, and ethical issues surrounding the use of information.

Revised July 2026

1	Make sense of problems and persevere in solving them
L.SS.11–12.1	Demonstrate command of the system and structure of the English language when writing or speaking.
2	Reason abstractly and quantitatively
TECH.K-12.1.1.a	articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
P.4	Demonstrate creativity and innovation.
TECH.K-12.1.1.b	build networks and customize their learning environments in ways that support the learning process.
P.5	Utilize critical thinking to make sense of problems and persevere in solving them.

3	Construct viable arguments and critique the reasoning of others
TECH.K-12.1.1.c	use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
TECH.K-12.1.1.d	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.
L.KL.11–12.2	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.
8.1.12.CS.4	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.
P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
P.9	Work productively in teams while using cultural/global competence.
TECH.K-12.1.2.a	cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
TECH.K-12.1.2.b	engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
TECH.K-12.1.2.c	demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
TECH.K-12.1.3.a	plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
TECH.K-12.1.3.b	evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.
TECH.K-12.1.3.c	curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
8.1.12.IC.1	Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.
TECH.K-12.1.3.d	build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.
TECH.K-12.1.4.a	know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
TECH.K-12.1.4.b	select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
TECH.K-12.1.4.d	exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
8.1.12.DA.2	Describe the trade-offs in how and where data is organized and stored.
TECH.K-12.1.5.a	formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
TECH.K-12.1.5.c	break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
TECH.K-12.1.6.b	create original works or responsibly repurpose or remix digital resources into new creations.
8.1.12.AP.1	Design algorithms to solve computational problems using a combination of original and existing algorithms.
TECH.K-12.1.6.d	publish or present content that customizes the message and medium for their intended audiences.

TECH.K-12.1.7.a	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.
8.1.12.AP.5	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
8.1.12.AP.6	Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.
8.1.12.AP.8	Evaluate and refine computational artifacts to make them more usable and accessible.
8.1.12.AP.9	Collaboratively document and present design decisions in the development of complex programs.
8.2.12.ED.1	Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.
8.2.12.ITH.1	Analyze a product to determine the impact that economic, political, social, and/or cultural factors have had on its design, including its design constraints.

Essential Questions & Essential Understanding

- How do you prepare a presentation on progress, and potentially not a complete project?
- How do you prepare a proposal for a portion of a larger project?
- What are some pitfalls of individualized learning, and how do you overcome them?

Objectives

Students Will Know

- how to plan and build a proposal to continue their research and building of their larger project.
- how to develop short term goals to reach a larger end project.

Students Will Be Skilled At

- keeping up with self established deadlines and to adjust future deadlines accordingly.
- self guided learning.

Learning Plan

Present previous project ideas to inspire new ideas. Classroom discussion on potential paths for each of the projects.

Develop Proposal Guidelines and Structure based on student project topics

Weekly check-ins to determine student progress on the deadlines.

Presentation at the end of each unit to review progress, discuss roadblocks and pitfalls & develop strategies for advancing.

Materials

Core Resource(s)

- CodeHS

Supplemental Resource(s)

- Khan Academy
- Pygame Textbook
- other approved tutorial sites

Assessments

- Formative: Daily assessments using check ins and exit tickets
- Summative: Teacher-created assessments dealing with each individual project
- Benchmark: Unit progress on the end project
- Alternative Assessments: Presentations, playtesting, and discussions

Integrated Accomodations & Modifications

Possible accommodations/modification forAdvanced Topics in Computer Science