CASTLE COMPLEX EDP PHASE 2 PROJECT (2018-2021)

UbD STEM UNIT PLAN TEMPLATE
(Adapted from ONR Engineering Success in STEM Project (K.Kawaguchi))

Teacher's Name:	School:	Grade Level:
Content Area:	Course Name:	Period:

Unit Title:	Approximate Time Frame:

Essential Vocabulary:
*Add subject and topic-specific vocabulary, in addition to the five stages of EDP (Ask, Imagine, Plan, Create, and Improve). **Attach vocabulary list with definitions if needed.**

STAGE 1: DESIRED RESULTS

NGSS Standard(s)
*State the standard by its grade level/cluster and topic here. [Clarification: The Next Generation Science Standards (NGSS) is three-dimensional. The Performance Expectation (PE) is comprised of Science and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs), and Crosscutting Concepts (CCCs). The teaching and learning with respect to these standards are integrated and three-dimensional and support learning across content areas. Phenomena drive the scientific investigation and the engineering design process drives the problem-based approach to learning in real-world and relevant contexts.].

Performance Expectation(s)
*State the specific, selected PEs from the corresponding standard above here. [Clarification: The PEs contain the three dimensions (SEPs, DCIs, CCCs) and will subsequently be unpacked below.]

Dimension	Name and NGSS code/citation	Matching student task or question directly from the activity
Science and Engineering Practices (SEPs)	*List citation and the identifying code from the standard (e.g. *Asking Questions and Defining Problems (K-2-ETS1-1)* [Clarification: SEPs are the practices of scientific investigation and engineering (Engineering Design Process (EDP)) that are transferrable to the real-world and applicable to relevant solving problems at school, home, greater community, and Earth.]	*What will students be doing with respect to this specific practice? [Clarification: Look at the key action words/verbs in the associated PE above to determine this abbreviated version of the student performance task.]
Disciplinary Core Ideas (DCIs)	*List the identifying code with title; and benchmark (bullet point) with associated PE. Example: *LS1.B: Growth and Development of Organisms.* Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)	*What are the bigger ideas from this science topic and content? What should students be able know and understand by the end on a larger scale? [Clarification: Look for these core ideas in the associated PE above. These should be embedded in the PE as one of the three dimensions.]
Crosscutting Concepts (CCCs)	*List the title and citation followed by the associated PE. Example: *Patterns.* Patterns can be used as evidence to support an explanation. (4-ESS1-1)	*On a broader scale, describe what students will do to understand the broader concepts that cut across all subject areas and are connected to the real world.

Learning Goal (Student Learning Objectives): (Skills, content knowledge and understandings, values, etc.) *Students will be able to…*	*Consider skills and concepts to be learned/experienced/practiced for this unit.
Essential Question(s):	*What will engage students and draw them in? These EQs should relate to the Enduring Understandings (Big Ideas) in the next section. Get away from the "What" questions, and think about the "Why" and "How" questions for these.
Enduring Understandings (Big Ideas): (Broad understandings that are not tied to place, time, specific people, etc.)	*This should be the answers to your EQs above. Thing big, broad, timeless, and applicable across groups of people, places, etc.
Other Standards/Benchmarks: Common Core Literacy Standards/Mathematical Standards C3 Framework for Social Studies Fine Arts Standards	*Real world challenges and a problem statement will naturally lead to integration across content areas. Consider how the three dimensional learning of the NGSS supports integration and note standards here.

Stage 2: ASSESSMENT EVIDENCE

Summative Assessment/ Performance Task	*Write a scenario here first (a brief narrative to draw students in) that is focused on the problem (problem statement). Make it relevant and engaging. *This should be an engineering design challenge that leads to the problem statement. The culminating performance may be the hōʻike and include the engineering notebook completed by each student.
Rubric(s) for Summative Assessment/Performance Task: (Attach documents)	*Attach any rubrics for products and presentations, team work, individual work, etc.
Formative Assessments:	*Explain any informal, formative assessments (i.e. discussion participation, group participation, visual observations), and also attach any worksheets (could be the pages in the Engineering Notebook). Quizzes? Exit slips for the day? Reflection questions in a Journal?
Engineering Notebook (With pages dated) (Attach notebook template documents by the steps of the EDP, including any final reflection and communication pages)	*Attach templates for the engineering notebook and any rubrics or criteria checklist to assess the notebook and evidence of meeting the Performance Expectations of the NGSS (Stage 1) and the student learning objectives (Stage 1)

Stage 3: LEARNING PLAN: *Each unit should have a <u>minimum of SIX activities</u> which includes and overtly addresses the five EDP components (ASK, IMAGINE, PLAN, CREATE, IMPROVE) *and* the communication/sharing/hōʻike** component of this unit.
Include brief narrative of activities, instructions, groupings, differentiated instructional and engagement strategies, and digital literacy tool(s).

The daily activities should encompass all or some of the Engineering Design Process steps, including brainstorming, sharing, and communicating ideas, findings, and future work:

Problem Statement (Scenario)
Ask: **Need Identification, Problem Statement, Client(s), Specifications**
Imagine: Research, Brainstorm Solutions
Plan: **Pugh Chart, Gantt Chart, Materials, Equipment, Procedures**
Create: **Prototype/Model, Test**
Improve: Reflect, Improve/Modify, Test

ASK (give a time frame for each activity/EDP step) Give a brief narrative (1-2 paragraphs of how an EDP stage is being addressed for this activity), and add in any essential questions for the lesson, instructions, groupings, differentiation, etc. if desired. This can actually be in the individual teacher lesson plans which may differ from class to class, even in the same grade level.
IMAGINE
PLAN
CREATE/TEST
IMPROVE
COMMUNICATE**
Materials, Equipment and Resources Needed to Implement Unit