**Engineering Design Curriculum Development Assignment (Construction Blocks)**

**Engineering Design Curriculum Project:** (100 pts)

Each candidate (individually or with a partner) will develop and present an integrated STEM education engineering design problem that delivers important STEM content and uses *construction blocks* as the primary problem solving material.

Parameters:

* Must be formatted to utilize the STEM design brief template
* Must include embedded art that helps to clarify the problem.
* Must use some type of uniform *construction block* (i.e., ABC blocks, KEVA Planks, Pixie Sticks, Craft Sticks, Lincoln Logs, tooth picks, Legos, Mega Bloks, Erector Set, K’nex, homemade blocks, etc.).
  + Note: Develop a creative problem that has not been done previously (**i.e., avoid bridges, towers, etc.**). Focus on the standards that you would like to deliver and the STEM content that you want students to learn.
* Must utilize the engineering design loop process for problem solving (use your own design loop)
  + Note: This is an engineering design problem, so there must be more than one possible solution to the problem. This is not a technical/procedural problem.
* The completed assignment must be submitted electronically as a .pdf and a Word document. The following should all be included with your lesson:
  + Lesson plan written to the teacher including title, standards *(include at least one STEM standard from each discipline, but feel free to add ELA standards, social studies, and others as well)*, big ideas, essential question(s), scenario, materials/resources, STEM content information, deliverables, parameters, assessment, and any worksheets necessary.
    - Note: Use the same format that you used with the Narrative Curriculum Assignment, but you do not have to include a reading text—although you could!
  + Include a teacher’s guide and simplified design activity guide written for the student (age appropriate wording).
  + Engineering journal or design sheet that scaffolds the design process
    - Individually completed team performance rubrics if applicable (\*\*These must be completed before the due date of the assignment).
* Prepare a brief class presentation (2 minutes) that outlines:
  + The STEM content addressed;
  + The engineering design problem that students will solve; and,
  + Your assessment and expected outcome (what do you expect the students to know, be able to do, and value after completing this lesson and design problem).

**Curriculum Design Team Rubric**

**Student Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Assignment or Activity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | Up to 0 pts. | Up to 2.5 pts. | Up to 5 pts. | Up to 10 pts. | **Score** |
| **Participation**  **(10pts. Assigned individually to teammates)**  **\*if applicable** | Made little to no effort to participate in the group project. | Made little effort to participate with team in development of project | Did not fully participate and contribute in all aspects of the project. | Team member appeared to share responsibility, cooperation was evident and tasks were completed in a timely and effective manner. |  |
|  | Up to 7.5 pts. | Up to 15 pts. | Up to 22.5 pts. | Up to 30 pts. |  |
| **Curriculum Content**  **(30 pts.)** | Curriculum does not present new information; does not follow recommended pattern; potential audience wouldn’t be able to grasp information/complete. | Curriculum developers were clearly uncomfortable with curriculum content and only included rudimentary information and/or partially met requirements. | Curriculum developers were at ease with content, but fails to fully address all requirements of the curriculum assignment. | Curriculum developers demonstrated full knowledge (more than required) and includes rich information that fully addresses the assigned task. Potential audience would learn. |  |
|  | Up to 7.5 pts. | Up to 15 pts. | Up to 22.5 pts. | Up to 30 pts. |  |
| **Curriculum Organization**  **(30 pts.)** | Potential curriculum audience would not understand because the product is not sequenced or organized adequately. | Potential curriculum audience would have difficulty following and completing the curriculum. | Curriculum is presented in logical sequence utilizing a recognized curriculum format. | Curriculum presents information in logical, interesting sequence using a recognized curriculum model which the potential audience can follow. The teacher’s guide is broken down so that the potential audience can understand the process for completing the activity with students. |  |
|  | Up to 5 pts. | Up to 10 pts. | Up to 15 pts. | Up to 20 pts. |  |
| **STEM Content and Alignment**  **(20 pts.)** | The curriculum does not thoroughly address standards or meet the intention of the standards. Minimal content information is provided. | The curriculum addresses standards but does not meet the intention of the standards. Some content information is provided. | Thoroughly addresses some of the standards and meets the intention of the standards. Some content information is provided. | Thoroughly covers standards and meets the intention of the standards. Thorough content information is provided. |  |
|  | 0 pts. | Up to 2.5 pts. | Up to 5 pts. | Up to 10 pts. |  |
| **Curriculum**  **Mechanics**  **(10 pts.)** | Curriculum has four or more spelling errors and/or grammatical errors. Organization was ill-conceived. | Curriculum had three misspellings and/or grammatical errors. Organization was an issue. | Curriculum has few misspellings and/or grammatical errors. Organization was adequate. | Curriculum has no misspellings or grammatical errors, was organized well, and was attractive. |  |
| **Comments: Total Points:** | | | | | |

**Team Performance Rubric \*if applicable**

**Project or Assignment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teammate Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The following rubric is designed to be used to assess student performance when working in teams.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | Up to 5 pts. | Up to 10 pts. | Up to 15 pts. | Up to 20 pts. | Score |
|  | Unacceptable Level Performance | Intermediate Level Performance | Accomplished  Level Performance | Superior Level Performance |  |
| **Responsibility: My teammate contributed at least 50% of the effort and helped us finish the task**. |  |  |  |  |  |
| **Contribution:** My teammate contributed to the success of the team, completed his/her share of the work, and offered constructive feedback to complete the tasks. |  |  |  |  |  |
| **Team Performance:**  My team completed the task or finished a project accurately, on time, & according to specifications because all members contributed. |  |  |  |  |  |
| **Team Collaboration:**  The team functioned at a high level—with all members carrying out specific roles and contributing equally. |  |  |  |  |  |
| **Communication:**  My teammate contributed to an effective team output, presentation, or communication of effort. |  |  |  |  |  |
| Comments: Total Points: | | | | | |