

Project Name – Rube Goldberg

Product A. – First Design (Individual)

Learning Targets (standards)

1. A... Students will understand and be able to demonstrate the workings of simple machines.
2. A. Students will understand energy transfer

Lesson (Blooms R..U A.. A..E...C) Blocks (A1234... B1234... C1234... D1234... E1234... F1234... G1234)

1. A...Discovery Streaming Videos, websites on simple machines, student jigsaw lecture, engineering mentors' collaboration

Assessment (Formative... Summative)

1. A...Journaling, exit tickets, small quizzes, collaborative note taking exercise applying to simple machines and energy transfer (Also include LT2)

Product B – Blue Print (Group with some indiv. roles)

Learning Targets (standards)

1. B...Students will demonstrate knowledge of design principals in solving a problem.
2. B...Students investigate the idea of constraints in application to design and engineering
3. B...Students will understand the significant aspects of design using a blueprint using constraints
4. B...Students will be able to perform measurement and scale tasks and apply to blueprint

Lesson (Blooms R..U A.. A..E...C) Blocks (A1234... B1234... C1234... D1234... E1234... F1234... G1234)

1. B...Catapult lab, design video, design lecture, design reading
2. B...Spaghetti Challenge, spaghetti video, video and lecture on constraints
3. B... Lab on scale and measurement, online activity of scale and measurement, blue print lecture, blue print mentoring by engineers, blue print workshop (Also include LT 4)

Assessment (Formative... Summative)

1. B... Journaling, exit ticket, lab write up, collaboration and creativity group rubric reflection activity
2. B... Journaling, Short presentation of spaghetti outcome using collaboration and creativity rubric along with ideas of constraints with outcome of lab, exit ticket
3. B... Feedback from engineers, monitoring of team discussions, journaling, lab report, check points on blue print, reflection on blueprint rubric (Also includes LT4)

Product C - Rube Goldberg Subsystem (Group with some indiv. roles)

Learning Targets (standards)

1. C... Students will learn how to work collaboratively to design a Rube Goldberg Subsystem Machine that follows constraints and demonstrates the use of simple machines and productive energy transfer.

Lesson (Blooms R..U A.. A..E...C) Blocks (A1234... B1234... C1234... D1234... E1234... F1234... G1234)

1. C... Safety lecture, workshop time, engineer mentoring, lecture and activity on iterative process

Assessment (Formative... Summative)

1. C... Individual journals, discussion with teams, reflection using rubrics (include 4 C's), engineering mentorship, exit tickets, group temperature check electronic forms, adherence to constraint rubric, final competition results.

Product D - Final Presentation (Group with some indiv. roles)

Learning Targets (standards)

1. D... Students will be able to create a collaborative presentation in Google Docs using proper principles of presentation
2. D... Students will be able to provide an understanding of learning the content objectives and design principles through a public presentation

Lesson (Blooms R..U A.. A..E...C) Blocks (A1234... B1234... C1234... D1234... E1234... F1234... G1234)

1. D... Presentation lesson, Pecha Kucha activity (Also includes LT2)

Assessment (Formative... Summative)

1. D... Individual journal, observation of team work, assessment of short Pecha Kucha activity, time line check list with rubric for presentation, Group rubric reflection (Also includes LT2)

Product E – Engineering Journal (Individual)

Learning Targets (standards)

1. E... Students will demonstrate the methods and importance through the writing of a Engineering Reflection journal

Lesson (Blooms R..U A.. A..E...C) Blocks (A1234... B1234... C1234... D1234... E1234... F1234... G1234)

1. E... Lesson on journal expectations and process, video on engineers using a journal

Assessment (Formative... Summative)

1. E... Student self-critique using rubric, Peer-critique using rubric, Check point conferences, daily observation, exit tick questions

Product F – Online Discussion Forums (Individual)

Learning Targets (Copy from the Finding the STEMbl in Standards Sheet)

1. F... Students will show their understanding of online forums through direct and deliberate participation
2. F... Students will gain an understanding of digital citizenship through practice

Lesson (Blooms R..U A.. A..E...C) Blocks (A1234... B1234... C1234... D1234... E1234... F1234... G1234)

1. F... Lesson on digital citizenship In regards to forums, reading on dc, video on dc, Harkness activity on digital citizenship

Assessment (Formative... Summative)

1. F...Harkness talk on Digital Citizenship and academic forums, Monitoring and digital feedback in the forum by teachers and peers, checkpoint reflections in the forum based on rubric expectations

Product G – Final Summative Assessment (Individual)

Learning Targets (standards)

1. G... Students will demonstrate knowledge of content through a summative and performance based assessment

Lesson (Blooms R..U A.. A..E...C) Blocks (A1234... B1234... C1234... D1234... E1234... F1234... G1234)

1. G... Online games, activities, videos and simulations, small group instruction based on needs, classroom labs and activities included above (Incorporated in other product lessons)

Assessment (Formative... Summative)

1. G... Various quizzes, online activities allowing students to measure understanding, peer study and review, periodic online formative tools in class using programs such as Socrative Gaming and Kahoot, exit tickets, surveys and polls