

Task Background

Domain & Area: Science - Physical Science

Target CCR Standard(s) (including level of standard, if needed) and/or adult diploma competency for Science or Social Studies:

MN Standard Adult High School Diploma Science Competency

Area 4: Physical Science

- Demonstrate an understanding of energy (types and transformations)

Task Description: The purpose of this task is to provide a student an opportunity to demonstrate competency in a fundamental concept in physical science: types and transformation of energy. In this task, a student will build a machine with at least 5 components that accomplishes a simple task and label the types of energy involved in the actions of the machine, including where it enters and leaves the system. Then the student will present the machine in a manner of their choosing.

Information for the Teacher

- All materials described below are found in a Google folder here:
https://drive.google.com/drive/folders/1jg3bTG-m7P5s7882h4io5Z_DV4ZPmJ2D?usp=sharing
- Students should have already studied the law of conservation of energy and energy types (both kinetic and potential as well as examples of each).
- Besides copies of the materials linked above (materials could be provided to students in print or electronic form), the student may need access to the internet to view the videos and to create a presentation of the machine. The videos could be used in a variety of ways, depending on the teacher's or student's context and access to technology: for teacher background, to view and discuss together with a student, or for the student to view independently with the notice/wonder activity and then check back in with the teacher.
- This task was designed to be completed mostly independently by a learner. For students needing more support, they are encouraged to ask for feedback on their work from a teacher and make revisions as needed, particularly when first sketching out the machine and operating it. Students are also encouraged to follow all activity instructions carefully and to study the rubric to understand how the machine will be evaluated and prompt any questions.
- Students can watch the videos and discuss what they notice and wonder using the graphic organizer provided. The first

video “How to Build a Rube Goldberg Machine will introduce what a Rube Goldberg machine is and give some tips as to how to build one.

- Students can choose how they will present their machines, including writing about the machine, demonstrating it, presenting about it, or creating a video. Whatever format students choose should include visual components so that the audience can clearly see the types of energy the machine is using. Students should also describe several of the energy transformations taking place in their presentation.
- This task was developed so that the individual components could be used in different ways. Presentation of the machine could incorporate CCRS Speaking & Listening Anchors 4 & 5, depending on the expectations for the presentation and the manner in which it is presented and feedback provided. It is up to the teacher to determine if appropriate CCRS standards could be included and up to the teacher and student to determine when task evidence is ready to be submitted to the portfolio reviewers, if the student is a diploma student.
- There is a rubric provided for evaluating the machine.
- **Task Option:** A student could create a presentation around an existing machine with at least 5 components that accomplishes a simple task, identify the types of energy involved in the actions of the machine and describe several of the energy transformations that take place. The rubric would need to be modified in the area of “Completeness” to reflect that the student didn’t build a machine but instead had enough information and visuals to demonstrate the existing machine and its components completely in the presentation.

Activities

Title: Background Videos

Materials: This activity includes the *following videos* and the “Notice & Wonder Activity” *handout*.

- “How to Build a Rube Goldberg Machine”:
<https://www.youtube.com/watch?v=iemltSAT9Ew>
- OK Go--“This Too Shall Pass” Music Video:
<https://www.youtube.com/watch?v=qybUFnY7Y8w>
- Goldieblox Commercial:
<https://www.youtube.com/watch?v=llGyVa5Xftw>

Teacher Facing Document

Title: Choose a Task	Materials: This activity includes the “ <i>Choose a Task</i> ” <i>handout</i> .
Title: Design Your Machine	Materials: This activity includes the “ <i>Design Your Machine</i> ” <i>handout</i> .
Title: Present Your Machine	Materials: This activity includes the “ <i>Present Your Machine</i> ” <i>handout</i> and the <i>Physical Science Task Rubric</i> .