

Engineering Activity (Telescope Design) Rubric

version 0.1

Cooney - 05/17/09

	Off-track	Emerging	Accomplishing	Mastering
<p>The <i>claim or finding or new understanding or solution</i> – what did learners “figure out”</p>	<p>Timeline is waste of time</p> <p>BOM is not important</p> <p>Design plan and schematics aren't important, just talk story about design</p> <p>Don't understand schematics or purpose of design plan</p> <p>Students don't understand purpose of pointed questions</p> <p>Students purposely make changes to schematics for no reason</p>	<p>Timelines are used to keep design on track</p> <p>BOM is just a list of materials in a design</p> <p>Design plan and schematics are guides for a design, rough estimates</p> <p>Students don't understand to read schematics or how to read design plan</p> <p>Students find unlimited questions ok and not important</p> <p>Students feel free to make changes to schematics with no reason</p>	<p>Understand timelines help guide design</p> <p>BOM is important to know what materials are available</p> <p>Design plan and schematics must be detailed and specific</p> <p>Students should follow design plan and understand schematics</p> <p>Students understand importance of asking pointed questions</p> <p>Students understand why changes were made to design plan</p>	<p>Understand and use timelines to guide design</p> <p>BOM aids design and allows efficient construction, not wasting materials</p> <p>Design plan and schematics are detailed, vital to construct designs</p> <p>Students follow design plan and can improve upon design</p> <p>Specific questions are vital in engineering, not guessing</p> <p>Design changes must keep original goal while improving design</p>
<p>The <i>evidence of support</i> – what information, data, and other evidence supports what learners figured out?</p>	<p><u>Design Phase:</u> Students have no timeline</p> <p>Students fail to list materials</p> <p>Design plan includes no schematic or description of design</p>	<p><u>Design Phase:</u> Students copy timeline provided from earlier part of activity</p> <p>Students partially lists materials required</p> <p>Design plan includes rough</p>	<p><u>Design Phase:</u> Students develop approximate timeline</p> <p>Students create BOM with almost all required supplies</p> <p>Students design plan includes</p>	<p><u>Design Phase:</u> Students develop detailed timeline and stick to it</p> <p>Students creat BOM with detailed quantities of materials</p> <p>Design plan includes</p>

	<p><u>Construction Phase</u></p> <p>Students fail to discuss with original design group or constantly ask questions</p> <p>Students fail to follow design plan</p> <p>Students report out only what they built, no explanations as to why</p>	<p>drawings missing info (no dimensions, no materials, etc)</p> <p><u>Construction Phase</u></p> <p>Students must ask original design group many questions regarding design</p> <p>Students build design plan making many changes</p> <p>Students partially list changes they made to design plan</p>	<p>schematics with dimensions and materials listed</p> <p><u>Construction Phase</u></p> <p>Students ask original design group limited and specific questions regarding the design plan</p> <p>Students build design plan according to schematic</p> <p>Students report out to group why they made changes to design plan</p>	<p>schematics with demsions and construction suggestions</p> <p><u>Construction Phase</u></p> <p>Students ask original design group specific questions about design plan</p> <p>Students build and improve design plan</p> <p>Students report out why they made changes to design plan and how it improves design</p>
<p>The reasoning or logic or argument of justification – how do learners link and interpret the evidence to justify their claim(s)?</p>	<p>Students think designs can just 'happen' with little or no documentation</p> <p>Changes are perfectly fine since the design is only a rough outline.</p>	<p>Students think a timeline, BOM, schematic, design plan as steps in construction of a design</p> <p>Changes are sometimes needed or changes are done by construction for less than specified reasons</p>	<p>Students justify timeline, BOM, schematic, design plan as steps in the design process</p> <p>Students understand changes in construction are sometimes important and may improve on a design w/o changing original intention</p>	<p>Students justify timeline, BOM, schematic, design plan as specific steps in the design process</p> <p>Students justify changes in construction are sometimes required and may improve on a design w/o changing original intention</p>

The engineering activity is different from the scientific inquiry in the categories (on the left) don't nicely fit with engineering. I didn't change the categories, just took the 'essence' of the category. I thought two stages are important in the activity: design and construction. Each has specific goals and

Design Plan = The final documentation which the design group (first day) will present to the review board and pass onto the construction groups (second day).

BOM = Bill Of Materials (including quantities)