Assessment rubric

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| **Formative questions** to ask students during the unit:   * What is the system in this activity? * How can we track energy flow in this activity? * Why is energy flowing through our system? When would energy stop flowing? In which direction is heat flowing in our system? What is your reasoning? * What types of heat transfer are occurring in our system? * What are your criteria and constraints? What are some possible solutions? How do your solutions deal with these criteria and constraints? Which possible solutions will meet the criteria and constraints best? What evidence supports your argument for your design solution?   **Summative questions** to ask students at the end of the unit:   * What were the criteria for this activity? * What were the constraints in this activity? * What factors were you optimizing? * Give one example of a trade-off you made. * Which design would you choose to prototype? Explain your reasoning and provide evidence.   **Area to assess** | **3** | **2** | **1** |
| **The temperature change of the astronaut (+/- °C)** | Temperature change is less than or equal to 2°C. **(Please provide Fahrenheit as well)** | Temperature change is greater than 2° and less than or equal to 4°C. | Temperature change is greater than 4°C. |
| **The cost of the final prototype.** Make a list of each idea and the cost to build them, from least to most expensive. | At the top 33% of the groups, representing the most economical prototypes in the class. | In the middle 33% of the groups, representing economical prototypes. | At the bottom 33% of the groups, representing the most expensive prototypes. |
| **Ability to function as a team** | Exceeded expectations to work together as a team. Individuals showed initiative and everyone clearly contributed. | Worked well together as a team. | Teamwork unclear. Project appears to be run by one or two people. Others did not pitch in to team effort. |
| **Explanation and documentation** | Exceeded expectations to make data-driven and scientifically reasonable design choices by showing clear results and well-detailed procedures. | Mostly effective at making data-driven and scientifically reasonable choices, but weaker in one of the two areas. | Unclear that the team made data-driven or scientifically reasonable choices. More of a trial-and-error approach. |