

**Project 1.1.6 Compound Machine Design Rubric**

Design

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| --- | --- | --- | --- | --- |
| Topics | 4 points | 3 points | 2 points | 1 point |
| Brainstorming Ideas | Generates at least three viable concepts. Selects most appropriate concept and clearly justifies the choice using the appropriate criteria. | Generates three concepts. Selects an appropriate concept and is somewhat able to justify the choice using marginally acceptable criteria. | Generates two concepts. Selects one concept using inadequate criteria. | Generates one concept.  |
| Final Design Images | Produces accurate pictorial sketches or electronic 3D models that meet the required design concepts.  | Produces marginally sufficient pictorial sketches or electronic 3D models of required design concepts.  | Produces pictorial sketches or electronic 3D models that are difficult to visualize. Sketches lack details. | Produces incomplete pictorial sketch or electronic 3D model. Does not present concept. |
| Final Design Written Communication | Is properly detailed for effective communication including labels, descriptions, signatures, and dates. | Is marginally detailed for effective communication including labels, descriptions, signatures, and dates. | Lacks many details for effective communication including missing labels, descriptions, signatures, and dates. | Lacks most details for effective communication including missing labels, descriptions, signatures, and dates. |
| DesignRequirements | Fully meets design requirements. | Meets most design requirements and supports the design function. | Meets some requirements but not enough to support the design function. | Does not meet any requirements. |
| Teamwork | Team members worked well together and settled differences in a positive manner. | Demonstrated good team working skills the majority of the time. | Demonstrated good team working skills part of the time. | Demonstrated few team working skills. |

Mechanism 1

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| --- | --- | --- | --- | --- |
| Topics | 4 points | 3 points | 2 points | 1 point |
| DesignRequirements | Mechanism is clearly identifiable as one that manipulates force or distance. Mechanical advantage and/or ratio is accurately calculated. | Mechanism is identifiable as one that manipulates force or distance. Mechanical advantage and/or ratio is calculated but not very accurately. | Mechanism is marginally identifiable as one that manipulates force or distance. Mechanical advantage and/or ratio is calculated but not very accurately. | Mechanism is difficult to identify as one that manipulates force or distance. Mechanical advantage and/or ratio is not calculated. |
| Quality and Functionality | Mechanism functions consistently and the chosen parts are appropriate. | Mechanism functions most of the time, and the chosen parts are appropriate. | Mechanism sometimes functions, and the parts are not chosen appropriately. | Mechanism rarely functions, and the parts are not chosen appropriately. |

Mechanism 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Topics | 4 points | 3 points | 2 points | 1 point |
| DesignRequirements | Mechanism is clearly identifiable as one that manipulates force or distance. Mechanical advantage and/or ratio can be accurately calculated. | Mechanism is identifiable as one that manipulates force or distance. Mechanical advantage and/or ratio can be calculated but not very accurately. | Mechanism is marginally identifiable as one that manipulates force or distance. Mechanical advantage and/or ratio can be calculated but not very accurately. | Mechanism is difficult to identify as one that manipulates force or distance. Mechanical advantage and/or ratio cannot be calculated |
| Quality and Functionality | Mechanism functions consistently and the chosen parts are appropriate. | Mechanism functions most of the time, and the chosen parts are appropriate. | Mechanism sometimes functions, and the parts are not chosen appropriately. | Mechanism rarely functions, and the parts are not chosen appropriately. |

Mechanism 3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Topics | 4 points | 3 points | 2 points | 1 point |
| DesignRequirements | Mechanism is clearly identifiable as one that manipulates force or distance. Mechanical advantage and/or ratio can be accurately calculated. | Mechanism is identifiable as one that manipulates force or distance. Mechanical advantage and/or ratio can be calculated but not very accurately. | Mechanism is marginally identifiable as one that manipulates force or distance. Mechanical advantage and/or ratio can be calculated but not very accurately. | Mechanism is difficult to identify as one that manipulates force or distance. Mechanical advantage and/or ratio cannot be calculated |
| Quality and Functionality | Mechanism functions consistently and the chosen parts are appropriate. | Mechanism functions most of the time, and the chosen parts are appropriate. | Mechanism sometimes functions, and the parts are not chosen appropriately. | Mechanism rarely functions, and the parts are not chosen appropriately. |

Compound Machine Assembly

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| --- | --- | --- | --- | --- |
| Topics | 4 points | 3 points | 2 points | 1 point |
| Mechanical Efficiency | The overall machine lost very little efficiency due to slippage and friction.  | The overall machine lost some efficiency due to slippage and friction. | The overall machine lost most of its efficiency due to slippage and friction. | The overall machine barely functioned due to slippage and friction. |
| Quality and Functionality | Mechanisms function together consistently and accomplish the identified task. | Mechanisms function together most of the time and accomplish the identified task. | Mechanisms function together sometimes but do not always accomplish the identified task. | Mechanisms functions rarely and cannot accomplish the identified task. |