

Judges' Rubric & AI Use Guidance

	Part A: PORTFOLIO (50 Possible Points)				
AI Guidance	AI use is not required. Teams that choose to use AI will be instructed to use it as an investigative tool with the expectation that their portfolio demonstrates original thought and meaningful learning. A team using AI should not automatically receive high scores. A team that does not use AI should not be penalized for not using the tool. Judges should refer to the Portfolio Success Criteria column (pg. 2-3) for areas likely to include AI generated responses.				
Success Criteria	5	4	3	2	1-0
Quality of portfolio's presentation including title and index pages	Title page contains all elements: school, team #, and student's names. Index links to marked pages and the overall presentation is high quality.	Title page contains all elements: school, team #, and student's names. The overall presentation is of a high quality. The Index is missing.	Title page contains all elements: school, team #, and student's names. The overall presentation is of an average quality. The Index is missing.	Overall presentation is of an average quality. The Index and the Title page are missing.	Overall presentation is of a poor quality. The Index and the Title page are missing (1).
Detailed outline of each team member's role in the production of the portfolio and planned production of the prototype	All team members participated in a material way and were familiar with portfolio contents and a production schedule was provided for the device.	All team members participated in a material way and were familiar with portfolio contents; however, no production schedule was provided.	Most team members participated but one or two were not very familiar with portfolio contents. No production schedule was provided.	Portfolio was done mostly by one or two students without a planned production of either portfolio or device.	One student prepared portfolio. The other team members are not at all familiar with portfolio contents; No Portfolio (0)
At least three illustrations of the initial machine design concepts	Three illustrations that show connecting parts in some detail.	Three illustrations, two of which show some connecting parts.	Three illustrations, one of which shows some connecting parts.	Two illustrations provided.	One illustration (1). No illustrations (0)
Isometric drawing of the portion of the prototype used to grab the object	The isometric drawing is properly dimensioned and of high quality.	The isometric drawing is of good quality with some correct dimensions.	The isometric drawing of fair quality with some correct dimensions.	The isometric drawing is of fair quality without dimensions.	Isometric drawing is poor without dimensions (1); No isometric drawing (0).

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Success Criteria	5	4	3	2	1-0
An orthographic drawing showing dimensions and construction notes	Orthographic drawing shows front, side and plan views drawn so the scaled dimensions relate to the views and includes notes.	Three orthographic drawings are provided and show the front, side and plan views using a consistent scale.	Three orthographic drawings are provided showing front, side and plan views using an inconsistent scale.	Only two of three orthographic drawings are available.	Only one of three orthographic drawings are available (1). No drawings (0).
Materials (with dimensions) used to build prototype from the Workshop Kit	Comprehensive list of materials provided, correctly labeled, and includes dimensions.	Lists all materials used, correctly labeled, and includes some dimensions.	Lists all materials used, correctly labeled, but without dimensions.	Lists some but not all materials, with some labels and dimensions.	Lists some materials without dimensions (1). No list (0)
Review the following Portfolio Success Criteria for AI use. The row below will help guide point deductions.					
Guidance on thoughtful use of AI and point deductions.	AI is used purposefully with clear reasoning, team ownership, and thoughtful evaluation.	AI is used purposefully with reasoning and ownership but lacks thoughtful evaluation.	AI is used purposefully with some reasoning and some team ownership but lacks thoughtful evaluation.	AI is used less purposefully AND lacks clear reasoning, team ownership, and thoughtful evaluation.	AI replaces student thinking. Its use was not purposeful AND lacks clear reasoning, team ownership, and thoughtful evaluation.
Success criteria	5	4	3	2	1-0
Describe how the team used the principles of structural strength and stability in machine design Review for AI use.	Uses 5 terms from the following sets: force or load, or compression, or tension; symmetry or triangulation; center of gravity or balance and counterbalance; support beams or struts; gusset or joining methods; or aesthetics.	Uses 4 terms from the following sets: force or load, or compression, or tension; symmetry or triangulation; center of gravity or balance and counterbalance; support beams or struts; gusset or joining methods; or aesthetics.	Uses 3 terms from the following sets: force or load, or compression, or tension; symmetry or triangulation; center of gravity or balance and counterbalance; support beams or struts; gusset or joining methods; or aesthetics.	Uses 2 terms from the following sets: force or load, or compression, or tension; symmetry or triangulation; center of gravity or balance and counterbalance; support beams or struts; gusset or joining methods; or aesthetics.	Uses 1 term from the following sets: force or load, compression or tension; symmetry or triangulation; center of gravity, balance and counterbalance; support beams or struts; gusset or joining methods; or aesthetics. No description (0).

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Success criteria	5	4	3	2	1-0
Rationale used to decide on the type of fluid power used and where to place the piston syringes. Review for AI use.	Explains the position of the piston-syringes in terms of actions (1). In doing so, uses 4 terms from the following sets: pneumatic and hydraulic; system or input and output; density or particle theory; pressure or Pascal's principle; lever or pivot; friction; work done or mechanical advantage.	Explains the position of the piston-syringes in terms of actions (1). In doing so, uses 3 terms from the following sets: pneumatic and hydraulic; system or input and output; density or particle theory; pressure or Pascal's principle; lever or pivot; friction; work done or mechanical advantage.	Explains the position of the piston-syringes in terms of actions (1). In doing so, uses 2 terms from the following sets: pneumatic and hydraulic; system or input and output; density or particle theory; pressure or Pascal's principle; lever or pivot; friction; work done or mechanical advantage.	Explains the position of the piston-syringes in terms of actions (1). In doing so, uses 1 term from the following sets: pneumatic and hydraulic; system or input and output; density or particle theory; pressure or Pascal's principle; lever or pivot; friction; work done or mechanical advantage.	Explains the position of the piston-syringes in terms of actions (1). No explanation (0).
Provide a list of alternative materials that would have been useful and explain why each would have been useful. Review for AI use.	At least three new materials are listed, and comments are included for current materials. Provides reasons as to why the new materials would be useful.	At least two new materials are listed, and the current materials are commented on. Reasons are given as to why the new materials would be useful.	At least two new materials are listed, and reasons are given as to why the new materials would be useful.	Two new materials are listed. No reasons are given as to why the new materials would be useful.	One new material is listed. No reasons are given as to why the new materials would be useful (1). No new materials listed (0).
Evaluation of your prototype machine, including conclusions from the build process. Review for AI use.	A good description of two prototypes and thorough documentation of lessons learned including reasons for choosing one of the prototypes.	A good description of a prototype and documentation of lessons learned with conclusions.	A fair description of a prototype and poor documentation of lessons learned.	A poor description of prototype and poor documentation of conclusions.	No description of prototype and no documentation of conclusions (1) No mention of prototype or conclusions (0).

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	Part B: WORK HABITS (10 Possible Points)				
Success criteria	5	4	3	2	1-0
Members of the group work independently and co-operatively in an organized way	All team members work co-operatively sharing the workload in a planned way by working in pairs and individually.	All team members work co-operatively sharing the workload by working in pairs and individually without an organized plan.	3 team members work co-operatively sharing the workload by working in pairs and individually. One team member participates minimally.	2 team members work co-operatively sharing most of the workload. The remaining members participate minimally.	1 team member does most of the work on their own with the remaining members participating minimally (1) Team participates minimally (0).
Members of the group demonstrate safe working practices	All team members wear safety glasses while cutting and drilling using the appropriate tools safely with materials held in a secure way.	Team members wear safety glasses while cutting and drilling using the appropriate tools safely with material held in an insecure way.	Team members wear safety glasses while cutting or drilling using the inappropriate tools with material held in an insecure way.	Some team members do not wear safety glasses while cutting or drilling using inappropriate tools with material held in an insecure way.	One team member wears safety glasses while cutting or drilling (1); No team member wears safety glasses at any time (0).
	Part C: DEVICE DESIGN AND OPERATION (10 Possible Points)				
Success criteria	5	4	3	2	1-0
The device uses materials effectively and is well constructed, with parts securely attached	The device has all parts securely attached and the materials are used efficiently.	The device has all parts securely attached. There are materials that perform a moderately useful function.	The device has most, but not all, parts attached. There are materials that perform a moderately useful function.	The device has some parts attached and there are redundant materials that perform no useful function.	The device has few parts attached and there are redundant materials.
The machine operates efficiently and the team's machine operation is organized	Device operates smoothly without any glitches, and the team works together efficiently.	Device operates with minor glitches, and the team successfully fixes it.	Device initially operates efficiently, but one piston becomes inoperative despite efforts to fix it.	Breakage immediately occurs when force is applied to the device; team members are unable to fix the device.	Device does not work (0).

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TEAAM SCORES:	Add scores BELOW each of the following scoring sections.				
	Portfolio (50 Points)	Work Habits (10 Points)	Device Design & Operation (10 Points)	Interview Questions (20 Points)	Total Points Accumulated

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Judges should refer to Part A's Portfolio Success Criteria column above for areas likely to include AI generated responses.

Interview question A: (5 Possible Points) - What alternative designs did you consider before selecting the design you are building?

Interview question B: (5 Possible Points) - Why did you select this design for the challenge?

Interview question C: (5 Possible Points) - Overall, what did you find most difficult with the project?

Interview question D: (5 Possible Points) - How did the team decide who would be responsible for each part of the project?

Interview question E: (Not Scored) – Did your team use A.I.? If so, what prompts did you use and how did they inform the decisions you made for your machine and portfolio.

Judges, please summarize the team's feedback on A.I. use: