Local Fluid Power Challenge Rubric *(detailed)*

FLUID POWER CHALLENGE — DÉFI ÉNERGIE DES FLUIDES

Part A: PORTFOLIO					
Success criteria	***5***	***4***	***3***	***2***	***0-1***
Quality of portfolio's presentation including title and index pages	Title page contains all elements: school, team #, student's names. Index links to marked pages and the overall presentation is of a high quality	Title page contains all elements: school, team #, student's names. The overall presentation is of a high quality. The Index is missing	Title page contains all elements: school, team #, student's names. The overall presentation is of an average quality. The Index is missing	The overall presentation is of an average quality. The Index and the Title page are missing	The overall presentation is of a poor quality. The Index and the Title page are missing (1)
A detailed outline of each team member's participation in the production of the portfolio and planned production of the device	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 did portfolio; other team members are not at all familiar with portfolio contents No Portfolio (0)
At least three illustrations of the initial design concepts of possible device	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	One illustration (1) No illustrations (0)
Materials used to build prototype from the Prototype Kit	A comprehensive list of materials, correctly labeled and including dimensions	A list of all materials used, correctly labeled and including some dimensions	A list of all materials used, correctly labeled without dimensions	A list of some but not all materials with some labels and dimensions	A list of some materials without dimensions (1) No list (0)
Description of the use of the principles of structural strength and stability	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; 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; 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; 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; aesthetics	Uses 1 term 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; aesthetics No description (0)
Rationale used to decide on the type of fluid power used and where to place the piston-syringes	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)

Success criteria	*5*	*4*	*3*	*2*	*0-1*
An 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	The isometric drawing is poor without dimensions (1) No isometric drawing (0)
An orthographic drawing showing dimensions and construction notes for the entire device	The orthographic drawing shows front, side and plan views and is drawn so the scaled dimensions relate to the views and includes not es	Three orthographic drawings are presented showing front, side and plan views using a consistent scale	Three orthographic drawings are presented 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)
A list of alternative materials that would have been useful with reasons why they would have been so	At least three 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 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 a prototype including conclusions from making it	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)
Part B: TEAMWORK & WORK HABITS					
Success criteria	*5*	*4*	*3*	*2*	*0-1*
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 participates minimally	1 team member does most of the work on their own with the remaining members participating minimally (1) The team participates minimally (0)
Members of the group demonstrate safe working practices	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	Only one team member wears safety glasses while cutting or drilling (1) No team member wears safety glasses while cutting or drilling (0)

Part C: DEVICE DESIGN, CONSTRUCTION AND OPERATION					
Success criteria	***5***	***4***	***3***	***2***	***1***
The device uses materials effectively and is well constructed with parts securely attached	The device has all parts securely attached. 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 device itself operates efficiently and is operated in an organized way	The device operates smoothly without any glitches and the team works together efficiently	The device operates with a minor glitch and the team successfully fixes it	Initially the device operates efficiently however one piston becomes inoperative despite team efforts to fix it	Breakage immediately occurs when force is applied to the device and the team members are unable to fix it	The device does not work (0)
TOTAL TEAM SCORE:	**SUMMATION OF SCORES**				
	Portfolio (50)	Teamwork & Work Habits (10)	Device Design, Construction and Operation (10)	Interview Questions (20)	Points accumulated in designated time period

Part D: INTERVIEW QUESTIONS
1: What alternative designs did you look at before selecting the design you are building?
2: Why did you select this design to use for the Challenge?
3: What did you find most difficult with the project overall?
4: How did you decide who on your team would be responsible for which parts of the project?