Challenge Rules

Every participating team must abide by the following rules in order to compete.

**TEAMS**
- Teams should include 3-4 team members (with special exceptions for certain classes)
- All team members must be in grade 7 or 8 depending which challenge they are competing in
- Team members on the same team must be from the same school

**DESIGN**
The final prototypes must abide by the following criterion depending on which challenge the team is partaking in:

**Laser Light Maze**
- The maze must have a minimum base area of 2’ x 2’
- It must be able to fit through a door
- Be easily transportable
- No taller than 3’
- **Be durable to last through 2 days of demonstrations (during the judging period and possibly the finalists ceremony)**
- The maze must have at least 4 different direction changes
- Laser light must enter at the start point of the maze and exit at the end point

**Potash Processing Machine**
- It must be able to fit through a door
- Be easily transportable
- No larger than 3’ x 3’ x 3’
- **Be durable to last through 2 days of demonstrations (during the judging period and possibly the finalists ceremony)**
- **Each team must supply their own form of “raw ore”; encouraged to be the material they tested their prototypes with (Valid justification of why the material chosen is a good substitute for “raw ore” can earn the teams some bonus points!)**
- Must complete the 3 basic functions of processing potash;
  1) Crush raw ore
  2) Mix the crushed ore with water
  3) Dump ore onto wet screening to get final product
Finalist Judging Criteria

PRESENTATION/DESIGN PROCESS BREAK DOWN
For All Participating Teams

*Verbal explanation of the design* /10
(All team members must understand and have equal knowledge of their design when making a verbal presentation)

*Visual Appeal* /10
(Both the display board and prototype should be visually appealing)

*Display Board*

  *Detailed Explanation of the Design Cycle* /10
  (Do the students have a clear understanding of a basic design cycle? Do they show the amount of iterations they went through before they reached a satisfactory final design?)

  *Outline of Limits and Constraints Encountered During Design* /5
  (Did they show possible issues encountered while designing/constructing? Issues such as the rules, safety issues, lack of time and materials available.)

  *Outline of the Objectives Met by their Final Prototype* /5
  (What were their main goals/objectives met? Did they work toward these goals because they weighed the most in technical points?)

  *Testing of the Prototype* /10
  (What methods did they use to test their prototypes? How did they iterate their designs based on test results?)

Total /50
**TECHNICAL BREAK DOWN**

**Potash Processing Machine**

*Number of Functions met* /15
(5 points per function met; can give half marks depending on how well the function was met)

*Time to process a certain amount of potash* /10
(ie. fastest time gets full points and decrease by 1 as placing goes down with a minimum score of 5 as long as functions are done within 60 seconds; ie. fastest gets 10 points, 2^nd place gets 9 point and so on until 5 points for all the slower machines as long as it is within 60 seconds)

*Efficiency* /10
(ie. highest ratio of final product retrieved from raw ore; does any get stuck and clog the system?)

*Creativity* /15
(completely based on judges own opinions; this score will be on a relative basis)

*Bonus for the most suitable choice of substitute used to represent raw ore/ potash* /5
(ie. if the substitute is easily crushed, outer shell melts in water and inner core stays solid the students will be awarded a maximum of 5 bonus marks; this score will be on a relative basis)

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**Total** /50

+ 5 Bonus Max
TECHNICAL BREAK DOWN

Laser Light Maze

Number of laser light direction changes /16
(4 marks per direction change)

Number of different reflective materials used /10
(5 points per type ie. mirrors and lenses)

Number of different geometric shapes of materials used /9
(3 points per type ie. concave, convex and flat)

Creativity /15
(completely based on judges own opinions; this score will be on a relative basis)

Bonus marks for change in elevation of maze /5
(1 point per platform used)

Total /50

Each team will receive a score out of 100 (50 from presentation/design and 50 from technical) from two separate judges and the average of these scores will deem each team’s placing among the competition.