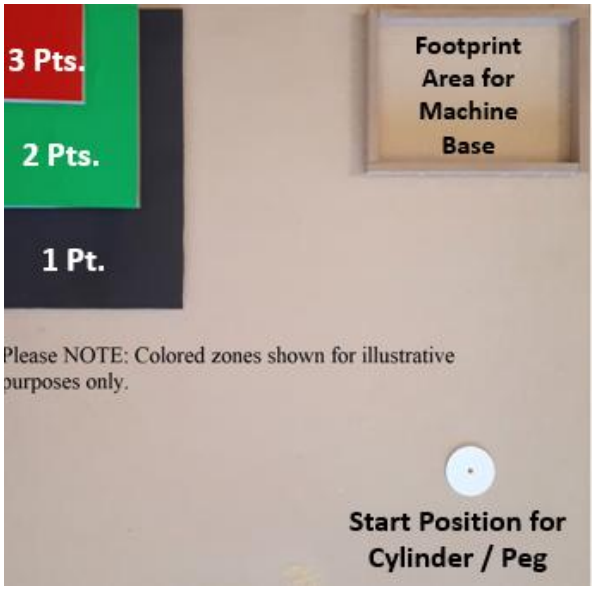
Waterfall Drop Zone Challenge Scenario



CHALLENGE SCENARIO:

- Your team will design and build a fluid power machine to pick up wooden cylinders from the "Start Position" on the Challenge Board and place them on one of three target shelves. Each cylinder must be moved and placed in an upright position on the target shelves. Your task will be to transport as many cylinders as possible within a two-minute time limit. Your team will choose the target shelf each time the object is moved.

CHALLEGNE BOARD SPECIFICATIONS:

- **Footprint Area**: the base of your machine must sit within the Footprint Area (see image), a rectangle 8-inch X 5¾-inch surrounded by a wall approximately ⅜-inch wide and 1-inch tall.

- **Cylinders and Start Position**: Each cylinder is 2-¾ inch tall x 1-¼ inch diameter, weighing approximately 1-½ ounces. They are managed by event judges and begin on the white Start Position (see image), a 2-inch diameter circle.

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CHALLEGNE BOARD SPECIFICATIONS CONTINUED:

The plane of the start position and the footprint area match. Any cylinder dropped in transit to the shelves will be returned to the start position. After a cylinder is successfully moved to a shelf, it will be returned to the start position by a judge.

- **Target Area Shelves**: Each shelf is ¾-inch tall, meaning a cylinder must be lifted vertically 2-1/4 inches to be placed on the top shelf. The bottom shelf is worth 1 point; the middle shelf is 2 points; and to the top shelf is worth 3 points.

CHALLENGE BOARD RULES / MOVING CYLINDERS:

- All movements of the machine MUST be controlled using fluid power.
- If a team moves / powers the machine by hand or **IN ANY OTHER WAY**, the team will receive zero points for all moving object scores.
- If a team creates a machine that only works when **stabilized by hand(s),** only 50% of the score will count.
- If the machine breaks during the 2-minute competition, the team can repair it during the remaining time, but all subsequent "moving object" scores will be reduced by 50%.
- The Judges' decisions are final.

WORKSHOP / KICK-OFF DAY:

Your team will learn about the Fluid Power Action Challenge, receive a Workshop Kit and hand-tools, participate in building exercises, and learn about the hand-tools.

TEAM MACHINE BUILD AT SCHOOL

At school, teams will research, design, and build a fluid power machine prototype. Credit will be given to a well-designed machine, particularly one that is strong and stable (i.e., counter-balanced), makes economical use of the available materials, and effectively uses the piston syringes.

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TEAM PORTFOLIO AND ARTIFICIAL INTELLIGENCE (AI) USE:

During the machine prototype build process, each team will prepare a portfolio, using the **Portfolio Checklist** as guide. The portfolio will be judged and contains the team's critical project information.

Use of Artificial Intelligence (AI) 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. Please use AI in a purposeful manner that represents the team's reasoning, content ownership, and insights.

Teams are not allowed to use AI (or agents) to create the machine design or generate the portfolio.

During the **Challenge Day interview process**, teams must inform the judges if AI was used. If so, share / explain what prompts were used and how they informed the decisions made for your machine and portfolio.

Note: Hosts, educators, and judges should refer to the Judges' Rubric for portfolio areas likely to include AI generated responses.

CHALLENGE DAY COMPETITION:

Teams will compete on the Challenge Board with their machines to earn points. Machine repairs may be needed; be sure to **bring your Tool Kit to Challenge Day.**

Most Challenge Days include the reconstruction of the prototype machine. **Your team will need to bring two copies of the Team Portfolio to Challenge Day.** The judges will evaluate one; your team will use the other copy to reconstruct the prototype machine from a fresh Challenge Day Kit. **Your Host or Organizer will provide directions specific to your event.**

Hot Glue stations will only be available after lunch on the Challenge Day. Teams are not encouraged to use hot glue unless it is an emergency – **wood glue and cardboard gussets are much stronger and less likely to become loose if in contact with water.**

Good luck to all!