BCIT Engineering Competition: Junior Design

Competitors Instructions

Background

High rises can present a challenge to first responders if there are no clear pathways to reach the top floors. Developing new deployable rescue technology that can quickly access these areas will allow first responders to save people trapped on top of taller buildings.

Objectives

Each team must create a device that can **safely take Fed from the building and safely place him down on the target.** The mechanism should take into account operation, simplicity, and efficiency of costs and deployment.

General Rules

- You will have 2 hours and 45 Minutes (9:30 to 12:30) to build and design your mechanism.
- You will have access to the local shop **after** the 15-minute brainstorming period.
- Teams will be given 250 “BEC Bucks” to buy anything from the store. Cheaper designs will receive extra points in the **usage of materials** category.
- You may only use the materials and tools that have been provided in the local shop.

Materials

PROVIDED
DO NOT USE THESE IN YOUR DESIGN.

- Box cutters
- Markers
- Rulers
- Hot glue gun

FREE

- **3** Cardboard
- Paper
- 10 Hot glue sticks
- 5 paper clips
- 2 rubber bands
-

$140 EACH

- Super glue

$20 EACH

- string – .5m
- syringes
- packing tape - 1 Piece

$15 PER EACH

- thin wooden dowels
- paper plates
- coffee cups
- pulleys

10 FOR $20

- BBQ sticks
- popsicle sticks
- thin elastic bands

$5 EACH

- pipe cleaners
- paperclips
- drinking straws
- thick elastic bands
- dowels

Testing and Presentation Format

Presentation	(6 minutes)
Question Period	(4 minutes)
Testing	(6 minutes)

Presentation Rules

- Visual aids are encouraged and additional materials may be used to enhance your presentation.
- **A projector will not be provided.**
- Presentations will be timed (6-minutes), and competitors will be notified of time remaining. **Presentations over 8 minutes will be cut short.**
- Everyone in the group must present.
- After presenting, give your bill of materials to coordinator (Michael).

Testing Rules

- Mechanism must extend out onto the building and pick up Fed from the start point. **It cannot extend beyond the start line.**
- Rescuing Fed from taller buildings will grant more points. You can choose what building height you wish to pick Fed from.
- Teams are allowed three (3) attempts to complete the challenge.Will take the last attempt team desires (e.g. If the 1st attempt is good but chooses to do a 2nd attempt and fails. Judges will take the 2nd attempt)
- Each attempt has a maximum duration of three (3) minutes.
- **Colliding with buildings will result in penalties.**
- **Dropping or not saving Fed will result in penalties.**

Evaluation

- **Functionality (40)**
    - Fed successfully placed on target (15)
    - Building height (15)
    - Usage of materials (10)

- **Creativity & Aesthetics (40)**
    - Cleanliness (20)
    - Innovation (10)
    - Uniqueness (10)

- **Presentation (20)**
    - Present problem (4)
    - Explanation of design process (4)
    - Justification of design decisions (4)
    - Critique of design for possible improvements (4)
    - Question response (4)

Penalties

- Fed falls/still on building(-30)
- Collision (-10)
- Overtime presentation (-4 per minute over)
- Teammate does not help in presentation (-8)
- Failure to list bill of materials properly (-10)

BCIT Engineering Competition: Junior Design

Judging Instructions

Hello and welcome to the 2024 BCIT Engineering Competition! Thank you for offering your time and expertise to judge this year's competition!

Junior Design Background

High rises can present a challenge to first responders if there are no clear pathways to reach the top floors. Developing new deployable rescue technology that can quickly access these areas will allow first responders to save people trapped on top of taller buildings.

Your Task

You are to choose the best team in the Junior Design category based on their performance (both as a team and in presentation), their product, and their design process/innovation. The team in first place will represent BCIT at the Western Engineering Competition (WEC) in Saskatoon, Saskatchewan from January 24th to 27th, 2025. The second place will be an alternate; if the winning team cannot go to WEC, this team will represent.

Judging Requirements

The junior design competition is about solution, design, innovation, and presentation. You will be judging the teams in these areas as well as surveying their teamwork skills.The breakdown is as follows:

Prompt given: Each team must create a device that can **safely take Fed from the building and safely place him down on the target.** The mechanism should take into account operation, simplicity, and efficiency of costs and deployment.

Testing Rules

- Mechanism must extend out onto the building and pick up Fed.
- Rescuing Fed from taller buildings will grant more points. You can choose what building height you wish to pick Fed from.
- Teams are allowed three (3) attempts to complete the challenge.Will take the last attempt team desires (**e.g.** If the 1st attempt is good but chooses to do a 2nd attempt and fails. Judges will take the 2nd attempt)
- Each attempt has a maximum duration of three (3) minutes.
- **Colliding with buildings will result in penalties.**
- **Dropping or not saving Fed will result in penalties**

Evaluation

- **Functionality (40)**
    - Fed successfully placed on target (15)
    - Building Height (15)
    - Usage of materials (10)

- **Creativity & Aesthetics (40)**
    - Cleanliness (20)
    - Innovation (10)
    - Uniqueness (10)

- **Presentation (20)**
    - Present problem (4)
    - Explanation of design process (4)
    - Justification of design decisions (4)
    - Critique of design for possible improvements (4)
    - Question response (4)
- **Penalties**
    - Fed falls/still on building(-30)
    - Collision (-10)
    - Overtime presentation (-4 per minute over)
    - Teammate does not help in presentation (-8)
    - Failure to list bill of materials properly (-10)

Junior Design Judging Matrix

Criteria		Out of	Teams TEAM_____
Functionality (40)	Fed successfully placed on target	15	
	Building height	15	
	Usage of materials	10	
Creativity & Aesthetics (40)	Cleanliness	20	
	Uniqueness	10	
	Innovation	10	
Presentation (40)	Present Problem	5	
	Explanation of Design Process	10	
	Justification of Design Decisions	15	
	Possible Improvements	5	
	Question Response	5	
Penalities	Fed falls/Fed still on building	-30	
	Collision	-10	
	Overtime presentation	-4 per min	
	Teammate does not help in presentation	-8	
	Failure to list bill of materials properly	-10	
Overall Total		**100**	
Additional Comments			