GRAVITY CAR

Skills Compétences Canada
British Columbia

COMPETITION OVERVIEW

The Junior Skills - Gravity Car race is an exciting team-based creative thinking competition where students design, build, and race a vehicle powered only by the force of gravity.

Eligibility: is open to students in Grades 6 - 9* (teams of of generally 2–4; mixed grades are allowed)

Racing Format: Tournament-style head-to-head races on a custom built provincial spec. gravity track.

Advancement: Top 3 teams from each region qualify to the Provincial competition.

some gr 5 students may be eligibile upon request

RULES

Check-In & Inspection

- **Vehicle is inspected for dimensions, weight, and construction quality before racing**
- **No modifications allowed after check-in (only tech chair–approved repairs)**

Race format is "head-to-head"

- **Winners advance; double elimination or single elimination may be used depending on event size, and quantity of Racers.**

"If you ain't first, you're last!" *— Ricky Bobby*

Track Specifications

Length:
- Incline: 24 ft (7.32 m)
- Flat runout: 8 ft (2.44 m)
- Total length: 32 ft (9.76 m)
- Start height 66" (1.68 m)
- Two lanes
- Width per 4 3/8" (111 mm)

Start Gate:

Manual release pins made from 5/16" (8 mm) aluminum rod, protruding 2 in (50 mm) above track surface

Please note: Tracks throughout the province vary. Centre wheels or 3-wheeled designs may interfere with start gate - be warned.

Protests:

- **Must be submitted within 5 minutes of the final race and before medals are awarded.**
- **Any rule violations or actions contrary to the spirit of competition will be reviewed by race officials.**

VEHICLES

The only source of power is the potential energy from *Gravity* pushing down as the vehicle sits against the starting gate on the inclined track. The maximum dimensions of the vehicle are *101mm (4") wide x 304mm (12") long*. There is *NO* height restriction. There is a *600 gram* weight restriction on the vehicle. The center front-most point of the vehicle must have NO MORE than 45mm (1.75") of ground clearance to accommodate the starting gate. The vehicle body must extend or be even with the forward most part of any wheel (Fig. 1-1).

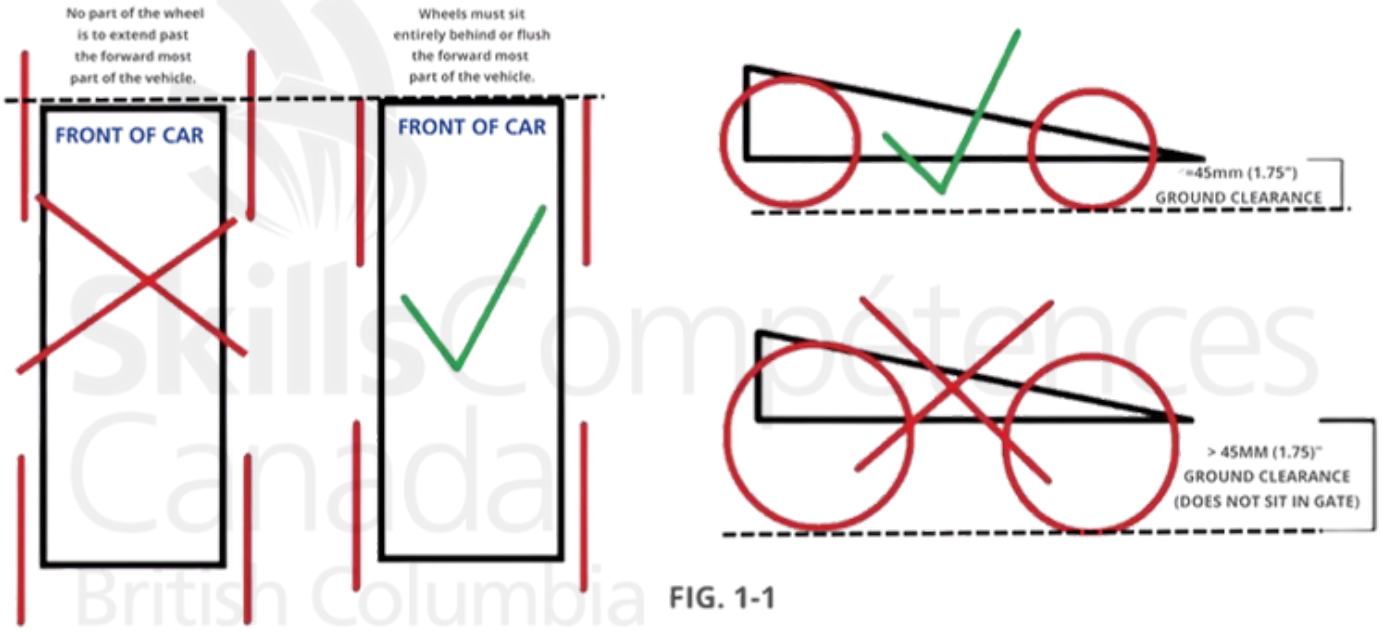

FIG. 1-1

Racing tip

Pairingthe right hubs with the right wheels can be the key to speed. Old CDs (especially "Rock & Roll" - lol) can make for the fastest found object wheels when paired with the correct hubs.

MATERIALS

Vehicles must be conceived and built by students using readily available materials commonly found in or salvaged from a typical school or home (e.g., wood, metal, plastic, repurposed parts from old electronics or hardware). Build kits are not permitted.
Exception: Only wheel hubs may be commercially purchased or 3D-printed.
All other components - including wheels, axles, and bearings - must be student-made or salvaged parts; bearings may not be purchased new. Teams must maintain a simple salvage manifest (source, part name/description, student initials) and present it upon request by Race Officials. All ballast/weights must be rigidly secured to the vehicle with no movement.

3D-Printed & Commercial Parts

- **Commercial purchases allowed: Wheel hubs only (hubs may also be 3D-printed).**
- **All other components - including wheels, connecting hardware, bodies, and frames - must be student-made, salvaged, or 3D-printed.**
- **Bearings must be salvaged or student-fabricated (including 3D-printed); purchasing new bearings is not permitted.**

3D-print limits (per vehicle):

- **Max 2 unique 3D-printed part designs. "Unique design" = distinct CAD geometry; simple scaling/mirroring doesn't create a new design.**
- **Max 6 total 3D-printed parts installed. Each separate piece present at inspection counts as one part. Laminated parts can be considered 1 piece witin final assembly/installation.**

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NOTES

We recognize that opening the Gravity Car competition to a broader range of designs will likely also introduce some new questions this season. That being said, we are confident that as long as the students themselves are the primary designers & builders, and the car parts are created, salvaged, or repurposed (*#builtnotbought*), then everyone will enjoy a fair and creative competition. Our goal is to keep the spirit of racing innovation alive, not simply reward those who can buy speed. If you have any doubts about whether your design or parts will qualify, please don't hesitate to reach out. In most cases, if your salvage manifest is complete and no parts are commercially purchased, your entry will be cleared for the starting line. Start your creative engines!

DESIGN TIPS

- Aerodynamics: Smoother shapes may reduce air drag
- Weight Distribution: Lower and balanced weight improves stability and speed
- Wheel Alignment: Straight, low-friction axles make a big difference
- Testing: If possible, test on a practice track before competition day

"The spirit of the competition is for the students to design and build fast cars, and to have a good time doing it. This year we are opening the design options up to allow innovation and advancement in the designs."

- Jason Schapansky -

Racecar Driver & PTC

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