

## 29. Balloon Cable Car

**Classroom Activity:** Design and build a balloon-powered vehicle that travels along a horizontal 1.5 meter string and back in the shortest time. The designs must be supported by data, analysis and drawings.

**Grade (s):** 11 and 12

**Course(s) and Strand (s):** Science

Physics, Grade 11 University

B. Kinematics

C. Forces

Physics, Grade 12 University

B. Dynamics

Physics, Grade 12 College

B. Motion and its Applications

See supplementary document Ontario Curriculum Alignment for Engineer-in-Residence Secondary Classroom Activities: Science and Technological Education for relevant overall and specific expectations.

**Assessment Categories:**

- Knowledge and Understanding
- Thinking and Investigation
- Communication
- Team-building skills

**Type of Activity:** Classroom/Lab or Independent Student

**Preparation:** 30 minutes

**Time needed to complete the task:** 75 minutes. (Students are expected to research the topic outside class)

**Materials and Resources for Teachers:**

1.5 meter string

supports for the string

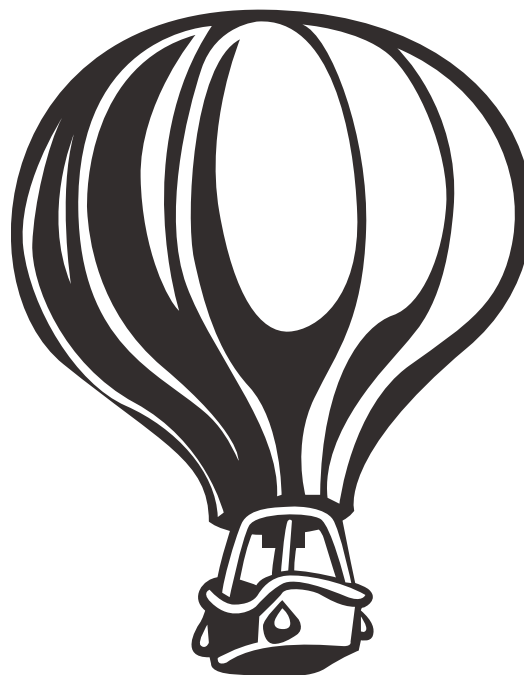
9" balloon

**Materials and Resources for Students:**

scissors

glue

exacto knife



found materials will be used for the body of the cable car

**Activity Description:**

Divide students into teams and outline the task. No parts, except air, can be added to the vehicle once it begins its trial. The vehicle must be attached to the string without removing the string from its supports. The vehicle may not be touched or pushed, directly or indirectly once the trial starts. The trip is completed when the vehicle is attached to the string touching the first support, then travels to the opposite end, turns and returns to the starting point. The official 9" balloon is provided on the day of the race.

Points are awarded as follows:

Doesn't move = 0

Moves, but not to the end = 10

Moves to the end but doesn't turn = 20

Moves to the end and turns = 30

Moves to the end, turns, but doesn't make it all the way back = 40

Moves to the end and returns to start = 50