
Speed Skating Competition
A series of heats will be used to determine the fastest vehicle on a "straightaway." Teams will program their vehicles (using Pilot or Inventor Level) to travel in a straight line for 4 seconds and stop. No sensors will be used. Racing lanes will be designated using tape, and extra points will be awarded for the vehicle that stays the straightest. After a series of heats have been used to narrow the field, a final race will be held to determine the overall winner. Course size is 8 ft x 25 ft.
**RECOMMENDATION: Program a one second delay before the vehicle goes to allow students to get their hands away from the vehicle after pressing "run".

2 Trotter groups

Slalom
Teams will navigate an obstacle course using the long touch sensor leads and Program #2 on the RCX. Vehicles will be awarded points for successfully passing through a series of skiing "gates." Scoring is based on speed and accuracy. Points will be awarded for successfully navigating the course in the shortest amount of time. If a vehicle goes off course or skips a gate, it must return to the point where it left the course- losing valuable time. A series of time trials will take place and the top five vehicles will do a second run to determine the winner. Course size is 8 ft x 15 ft. Gates will be 5 inches high and 1 foot apart.

3 Trotter groups

Figure Skating Competition
Teams will program their robots move around a "rink" area to music. The rink dimensions are 4 ft x 8 ft. The music can be developed using Robolab or teams can bring a tape/CD of their own to the competition. Robot figure skaters will be judged on criteria such as overall routine, how well the movement of the robot coordinates to the music, how the robot design reflects the music and artistic merit. Specific judging criteria will be available at a later date. No alteration or uploading of programs is allowed at the competition. NOTE: The competition organizers will provide a CD player and tape player. Figure skaters should perform for a minimum of 30 seconds.
Creation Station
This event will give teams an opportunity to showcase their creativity by creating an animated robot or scene. Pieces from multiple RoboLab Kits and outside materials may be used for this particular event. However, only 1 RCX can be used. The base on the robot must be stationary (so that it will remain in one place on a table), but teams can add as much animation, music, and other RoboLab (2.0 or 2.5) features as they like. It is recommended that entries have at least one sensor (touch or light) for visitor interaction. It is also recommended that teams utilize programming elements such as loops and jumps so that the animation and other features can run continuously for observers. A number of criteria, including artistic merit, functional design, use of music and other features, and animation will be used to determine the winner. Specific judging criteria will be available at a later date. Allotted space for the creation station is 2 ft x 2 ft. Please request approval for larger designs.

5 Trotter groups

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Part 2: Preparation Notes for Trotter students
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Speed Skaters:
You need fast sturdy robots that travel in a straight line. If the robot wobbles or weaves, you’ll be losing precious time because your robot will be traveling farther than anyone else’s; just think how a wiggly line is longer than a straight one when going from one place to another.

1. Your robot needs to be balanced (same on the right as on the left) so it doesn’t twist. You don't want it to wobble as it runs.
2. It needs to be long but not so long that it gets too heavy - this will help it go straight - if it’s long it’s more like the course it will be running. Remember how your speed vehicles didn't do well on the obstacle course until you made them shorter?
3. It needs large rear wheels and good rear wheel traction.
4. It should be light.
5. It should be sturdy, but not armor reinforced!
6. It should have more weight over the wheels that are connected to the motors than over the other wheels.

Slalom racers:
You need short, sturdy, quick moving vehicles that can turn quickly and easily without flipping over. They should be compact. Your other biggest challenge will be training! Yes, you have to learn to control it! One member of your group should be the primary designer. The other will be the driver. Figure out who does which best.
1. Must be strong --> add structural pieces (struts) to hold it together
   Remember: turning makes it twist in all sorts of directions causing
   wheels or wheel assemblies to fall off, and robots to fly apart.
2. Must be low to the ground (so it doesn’t topple over).
3. Can’t go as fast.
5. Helps to use front glides or single swivel wheel --> less friction when turning.
6. Needs weight evenly distributed so it doesn’t pop wheelies.
7. Needs smaller wheels and may even benefit from a smooth glide instead of front wheels, or
   possibly a single centered swiveling wheel for the front.

**Figure Skaters:**
You have the most work to do! So I hope you are ready for the challenge!

1. The *beginning planning:* Meet with your partner or talk by phone to figure out what kind
   of creature you want. here are some possibilities:
   - monster
   - clown
   - graceful ballerina
   - acrobat
   - animal - you choose which kind
     (robotic animals are the most popular kind of robot)
2. The *Robot:* Think about the structure of the robot: is it going to stand up like a primate, or be
   on all fours like a cat? Will it be plain and sleek, or decorated with lots of Lego accessories? At
   the same time, you need to be thinking about what your robot will do and how it will behave.
   The RCX has only three outputs, so if you want your robot to turn about and swivel around,
   that’s two motors, and you’ll have one output left. If you want arms that move up and down,
   they will need to move together because you have only one output left and arm movements will
   both need that one motor. Also, do you want to use sensors?
3. The *software control:* Think about the music you will perform to and what you want the
   robot to do. Draw it out on paper. Dance it yourself and figure out some way to communicating
   it between you two. You’ll have to translate this to programming. Finally, watch the robot and
   keep refining the process.
4. The *final stuff:* Think about all the extra touches like whether you want special lighting, an
   introduction, should the audience clap along, etc.

Note: it might be that one group member should be the robot designer and the other should be the
choreographer (selecting how the music and movement go together).