

RUNNING A VEX IQ ROBOTICS CLUB IN ELEMENTARY SCHOOL



WAYS TO INSPIRE
CONFERENCE

Saturday, September 28, 2019



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“Kids today need to be digitally savvy,
and that means having the capacity to create and
collaborate with digital technologies.”

<https://www.orion.on.ca/news-events/blog/nurturing-digitally-savvy-kids-at-uoit>



A LITTLE BACKGROUND ABOUT MY EXPERIENCE WITH EDUCATIONAL ROBOTICS

- Began in 2002 – Winona Elementary School
- Train the Trainer – 6 teachers in 6 elementary schools
- LEGO Mindstorms – RCX Platform
- Aquabots
- Robotics Challenge, Sheila Rhodes
- Cooperative Learning
- Setting and Lessons: Multiple classrooms extending down a long hallway, limited contact and interaction between students, isolated and non-collaborative, testing on the hallway floor, build your own robots from scratch, lessons in structural instability



<http://www.stemcentric.com/rcx-tutorial/>

ROBOTICS INVENTION SYSTEM



Early LEGO Days:

LEGO RCX Robotics
Circa 2002

PAST PLATFORMS USED AT WINONA:

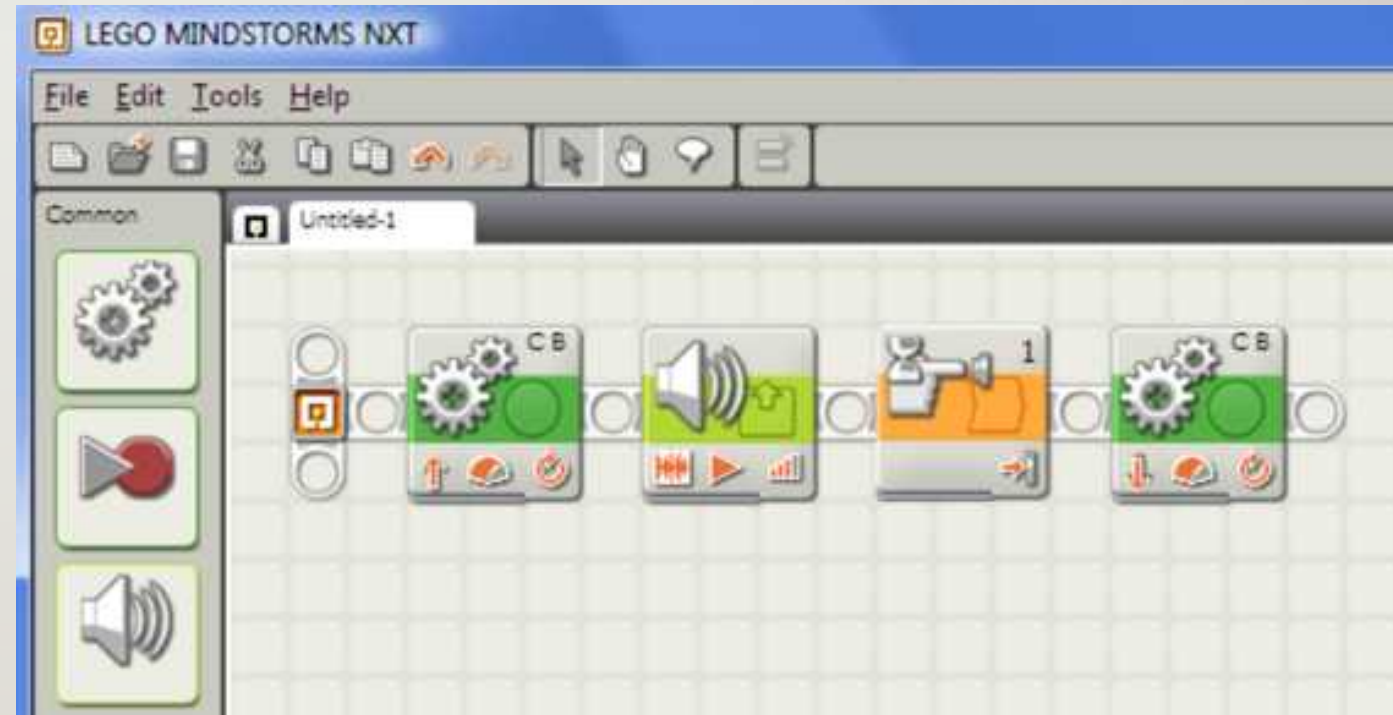
I. LEGO MINDSTORMS RCX



<http://www.conrad.com/ce/en/product/190613/LEGO-8547-MINDSTORMS-NXT-20-D>

PAST PLATFORMS USED AT WINONA:

2. LEGO MINDSTORMS NXT

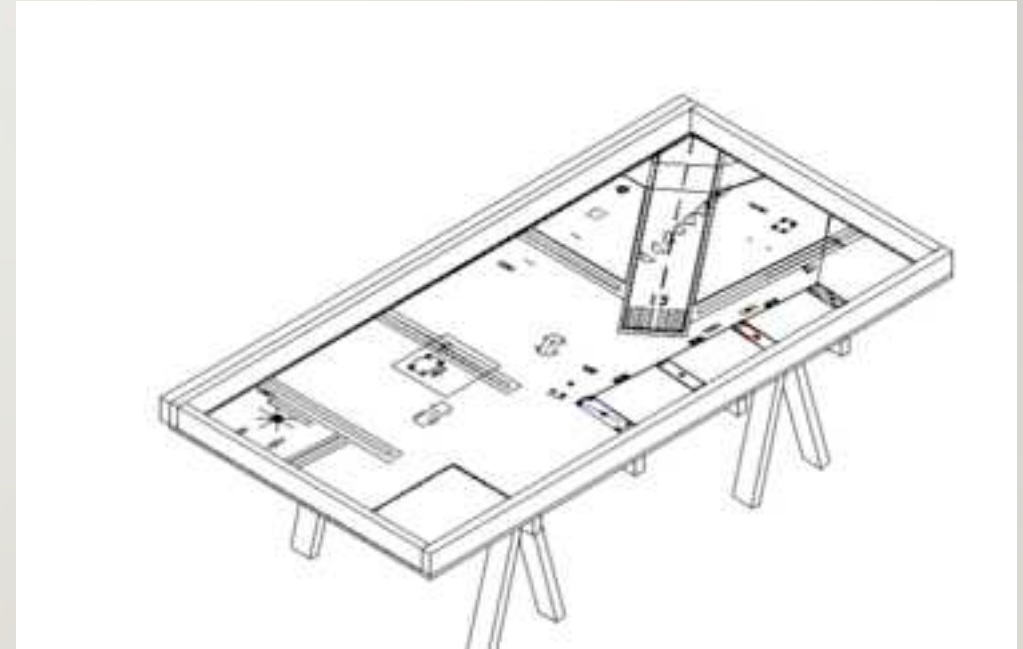


<http://www.conrad.com/ce/en/product/190613/LEGO-8547-MINDSTORMS-NXT-20-D>

http://www.education.rec.ri.cmu.edu/previews/nxt_products/nxt_video_trainer/partial_product/

BUILDING A ROBOTICS TABLE

- First Lego League Tables



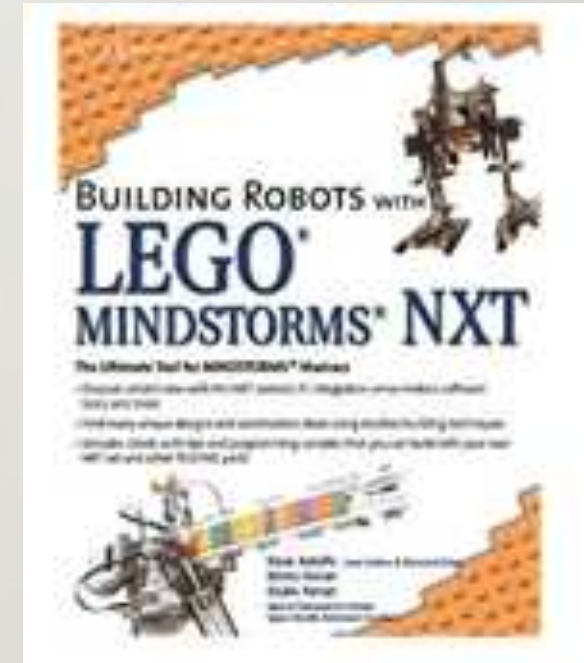
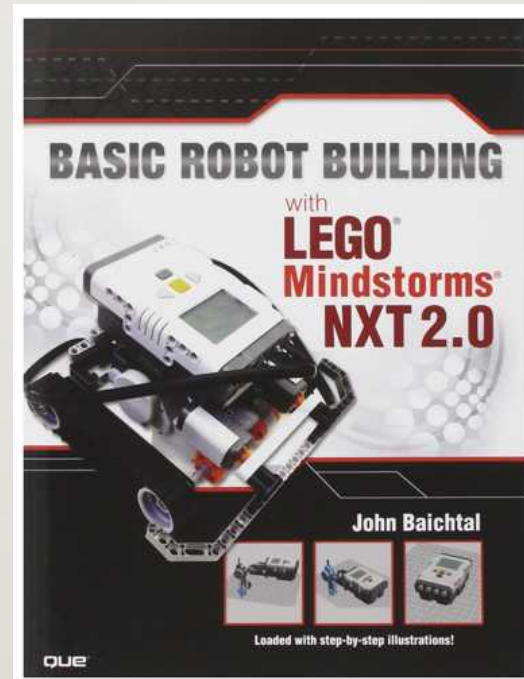
GREEN CITY CHALLENGE

- Environmental Stewardship theme-based Robotics challenge
- Kit includes props for challenge – wind turbine, solar panels, dam, etc.
- Students work at own pace to complete challenges.
- Differentiation of challenge levels.
- Includes mat that fits regulation Robotics table.
- Can be used to train for First LEGO League.



OTHER RESOURCES

Books



LEGO MINDSTORMS SUPPLIER

Spectrum Educational Supplies

Winona's primary "Go-To" supplier for LEGO kits and materials

2018 Grades 1-8 Elementary Science and Technology Catalogue



CURRENT LEGO ROBOTICS TECHNOLOGY

EV3 Systems



OTHER EQUIPMENT AND STORAGE NEEDS

- Stanley Parts Organizers
- Parts bins
- Separate “mini” bins to store each model in progress
- TIP: Label each mini-bin and matching base kit with names of students working on that particular robot. Avoid any mixing of parts.
- Power bars
- Robotics table or field
- Computers – desktops, laptops – must have adequate hard drive space to be able to load and store software.

OTHER POINTS TO CONSIDER

Consider high costs of constant upgrading of equipment

Recommendation:

Stick with one platform and use it until it conks out.

Just getting started? Latest technology is worth considering.

Benefits of previous version technology:

Available parts, books and resources, familiarity with summer camps and programs, students may own kits at home.

Winona's Experience with NXT is a case in point.

CARNEGIE MELLON UNIVERSITY – ROBOTICS INSTITUTE

[Introductory Video](#)

<http://education.rec.ri.cmu.edu>



Robotics Academy and Robotics Institute

<http://education.rec.ri.cmu.edu/lego/getting-started/>

- Offers professional development for teachers including online courses
- Offers excellent training software options

FAST FORWARD ... HWDSB – NEW DIRECTIONS 2015 AND BEYOND



VEX ROBOTICS AT WINONA



WINONA'S ROBOTICS CLUB

Why Run a Club? Why After School?

Time for Set-up and Take Down.

Availability of Mentors.

Extended Time to Explore, Learn.

Minimal Distractions.

Offered to All Grade 7 and 8 students.

Expanded Reach.

Curriculum Implications.

A sense of belonging.

Reaching a unique student niche.



PROS... NO CONS!

Discovery learning, cooperative and collaborative

Theme-based

Non-competitive, all may participate

Partners, Teambuilding

Students become experts

Show and tell with parents

High School Mentorship Opportunities

2056 Regional competition – Culminating Trip for Robotics Club



VEX IQ PRICING



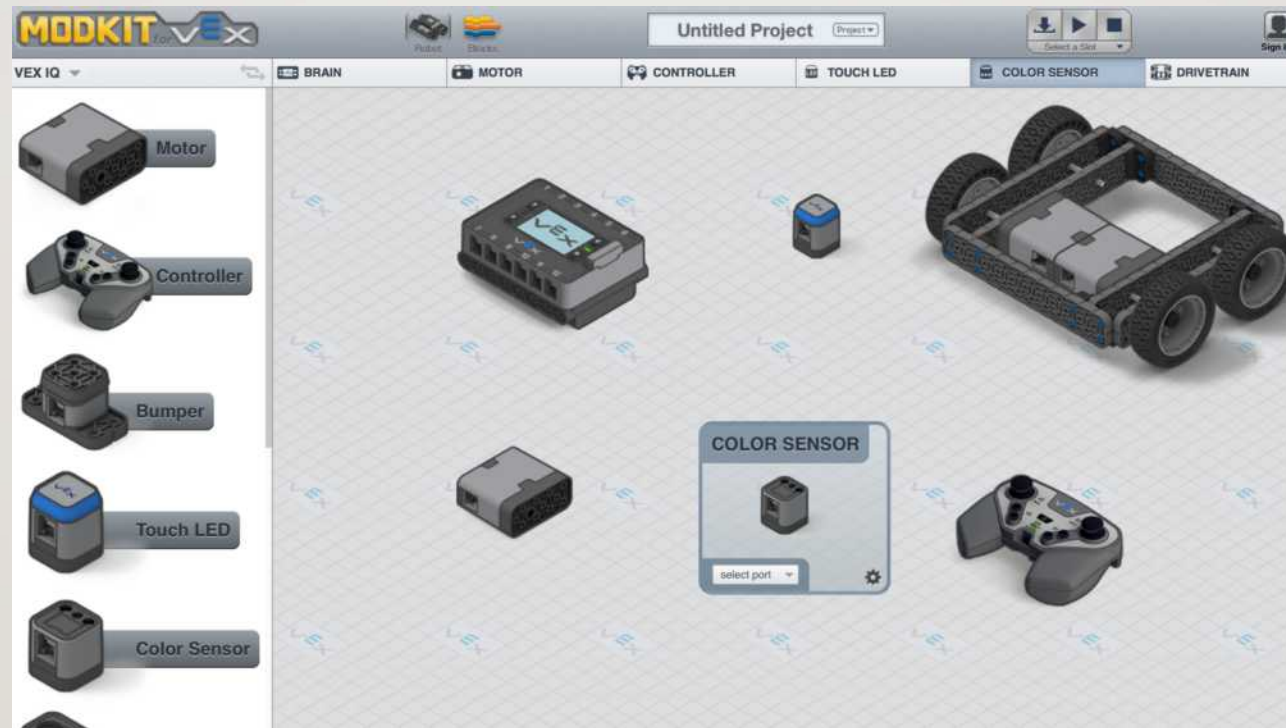
VEX IQ Super Kit \$429

Playing Field \$259.98

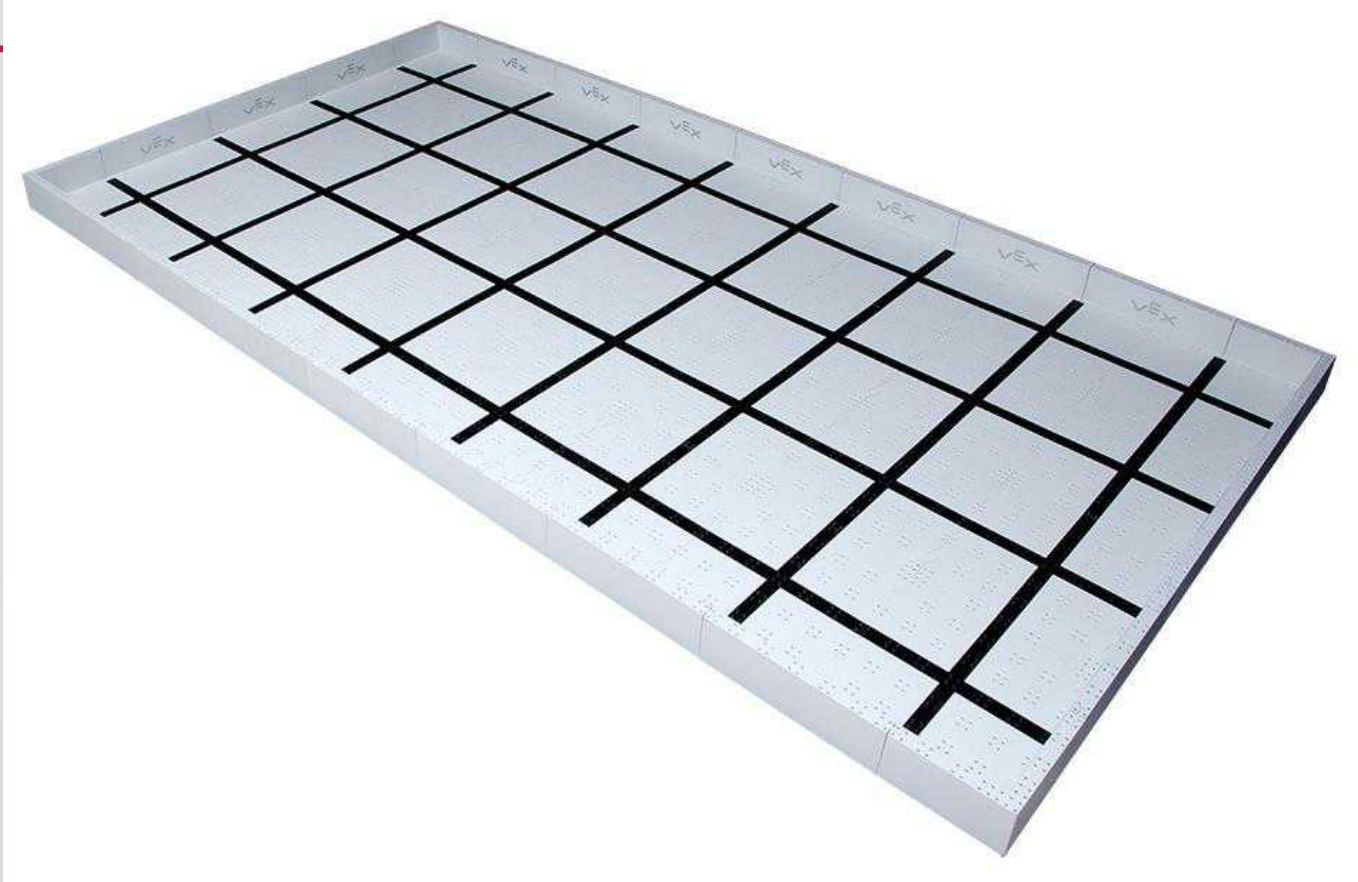
Free Modkit Software available online.



MODKIT FOR VEX – DRAG AND DROP SOFTWARE



VEX FIELD AND MODKIT APPLICATION



SCHEDULE AND BLOCKING

Club ran in pre-defined calendar blocks after school.

There were 8 to 10 sessions per block. A session runs from 3:00 to 4:30 p.m.

Number of students per block based on kit availability.

2 to 3 students per kit. About 12 to 14 students per block.

Advantage of After-School: limited disruption, more time-on-task.



SETTING – WHERE DO WE MEET?

Computer Pod Outside Science Classroom

- Allows for easy access to stored robots, kits and parts in classroom cupboards
- Robotics table is also stored in pod. VEX field is collapsible for easy storage.
- Batteries are recharged in science room after each session
- Need to be careful about number of people joining and space – 7 pairs of students plus 1 teacher plus 2 mentors means that there may be at least 17 people in the pod at a time. Tight confines for a small group.

BLOCK SCHEDULE (SUBJECT TO CHANGE)

Session 1 and 2– Introduction, Building a First Robot

Session 3 – Introduction to Programming

Sessions 4 – 7 Inquiry Exploration (VEX) or Engaging in VEX IQ
Challenge task (** Lots of options here)

Session 8 – Parent Open House

Session 9 – Parts Re-organization (Vital step! Don't neglect this)

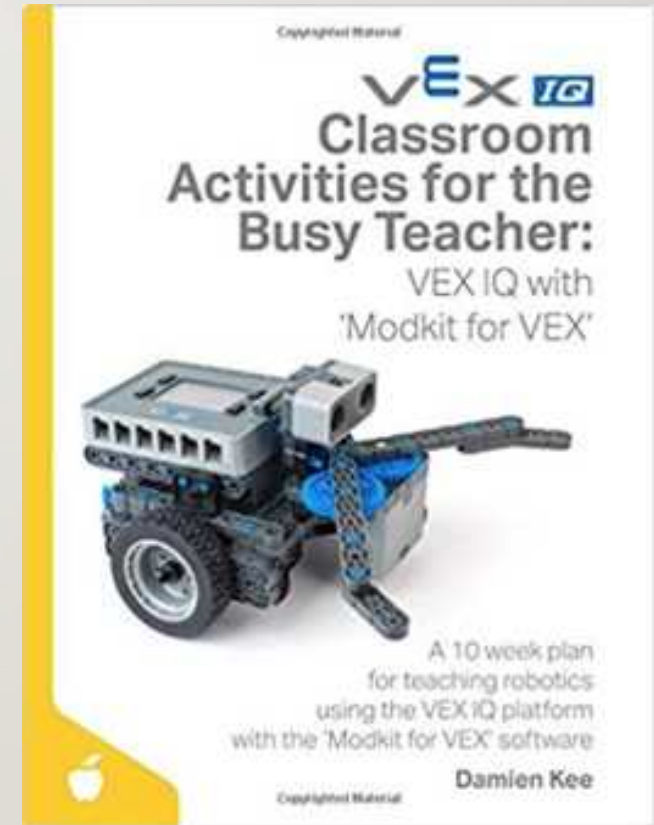
CULMINATING ROBOTICS CLUB TRIP - MARCH

On multiple occasions, we have travelled to the University of Waterloo or the Hershey Centre in Mississauga to watch Orchard Park's 2056 Robotics team compete.

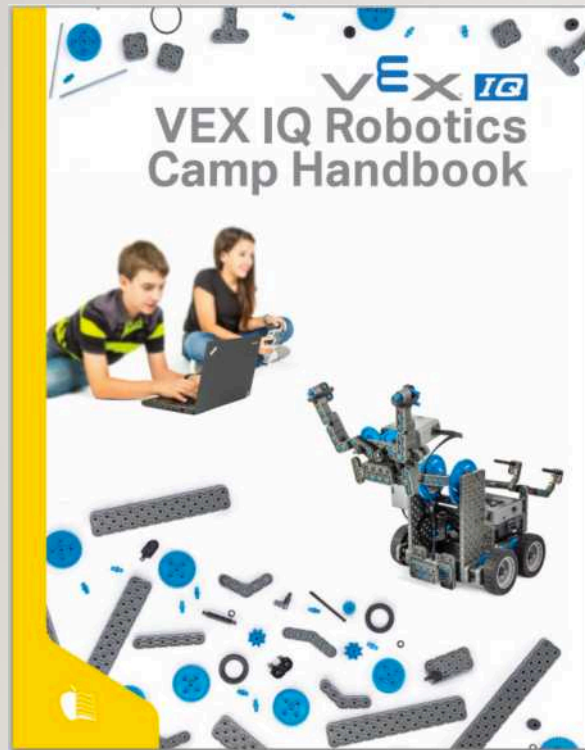
Lots of Winona student alumni help to form the OP team. Great opportunity to share with parents and students the possibilities to continue Robotics beyond Grade 7 and 8.



NEW ROBOTICS PROGRAM OPPORTUNITIES



NEW ROBOTICS PROGRAM OPPORTUNITIES



ACCESSING FUNDS

School Council Contributions

School science budget

Slush funds - \$5.00 per student

Generous parents

Corporate donations

USING SYMBALOO TO ARCHIVE RESOURCE SITES FOR VEX



SUPPORT AND PART ORDERS

- iDesign Solutions (<https://www.idesignsol.com>)

Mario DeCarolis – owner

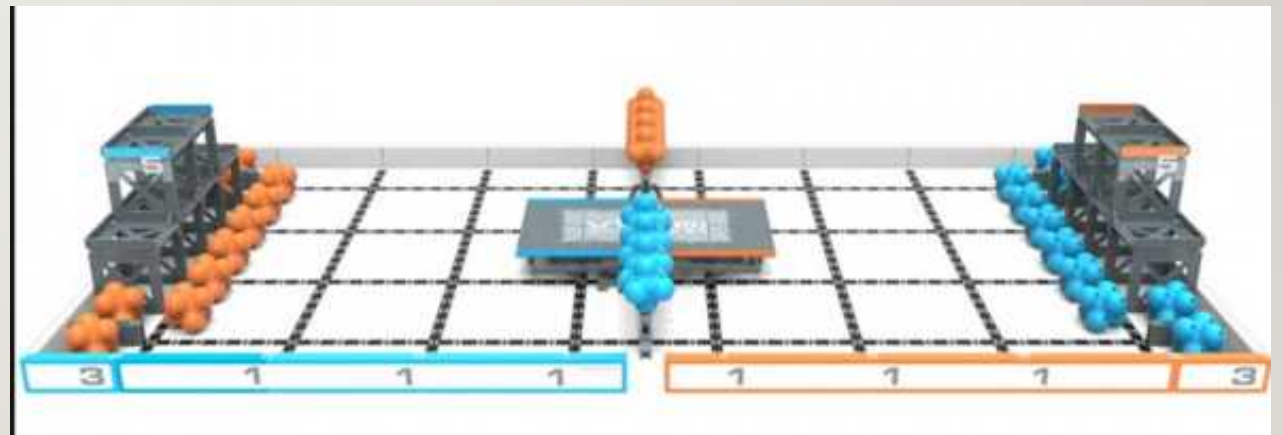
416-213-8445

1-877-730-4770

VEX IQ BOARD LEVEL CHALLENGE

The current HWDSB Initiative to encourage elementary schools to explore STEM Robotics Technology ...

Supported by OP's
Team 2056.



<http://www.robotshop.com/en/viqc-crossover-full-field-game-elements-kit.html>



2016 – 17 HWDSB VEX CROSSOVER CHALLENGE

16 SCHOOLS PARTICIPATED
HIGH ENERGY, EXCITEMENT, TEAMWORK &
COOPERATION



2017-18 HWDSB VEX RINGMASTER CHALLENGE



Nearly 30 HWDSB schools participated.

2018-19 HWDSB NEXT LEVEL CHALLENGE...



INCLUDED IN PACKAGE

- Slide Show Handout
- Resource Information
- Sample Letter to Parents, Trip Letter
- Sample Block Organization Schedule

QUESTIONS? NEEDING MORE INFORMATION?

Feel free to contact me
by email.

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