“GAINING MOMENTUM"
AN OMAHA NORTH IRHS CHAPTER
COMMUNITY SERVICE PROJECT PORTFOLIO

- OMAHA NORTH ROBOTICS -
Omaha North High school • Team 1064
4410 N 36th St Omaha, NE 68111

PRESENTED BY THE OMAHA NORTH IRHS CHAPTER AND TEAM
1064M – MOMENTUM

STUDENT ENTRANTS: IVAN AVILES SEBASTIAN, SARA BASCOM, ASHLEY HANKEL

NOTE:
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THANK YOU FOR READING ! – IVAN.A

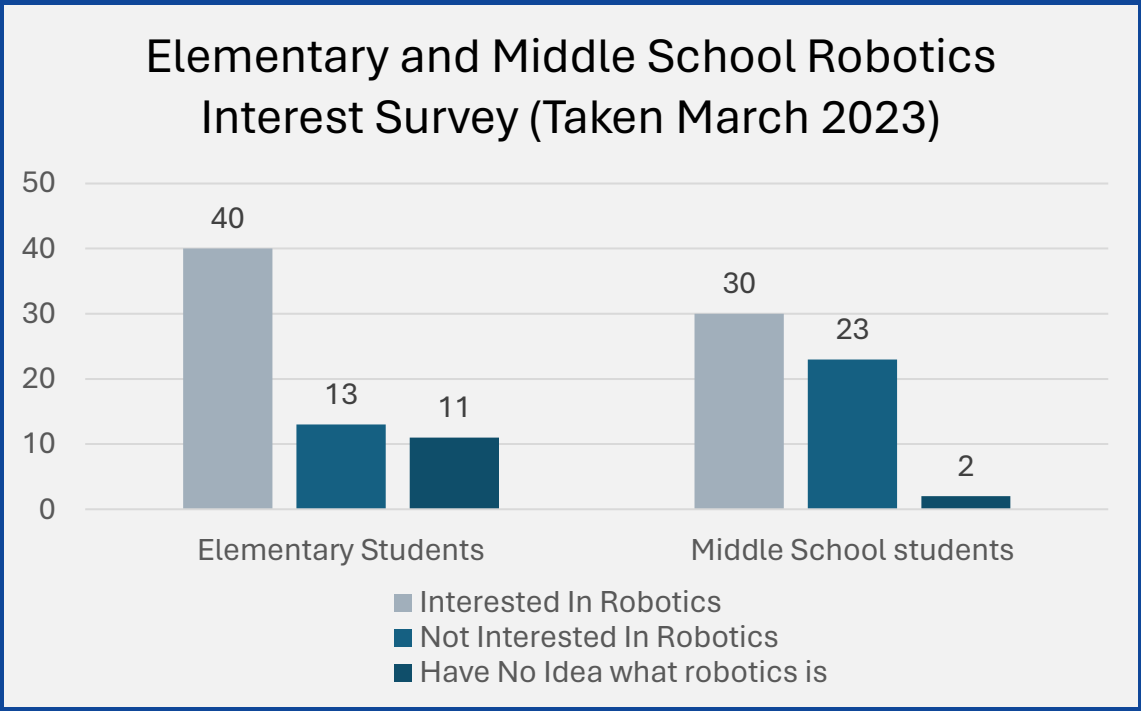
ABOUT US

OUR MISSION. OUR GOAL.

The Omaha North High School Chapter of the International Robotics Honor Society aims to foster and grow younger students' curiosity in STEM [Science, Technology, Engineering, and Math]. We have decided to push robotics toward younger students because we have seen a major decline in the number of younger students interested in joining the robotics program in our school and our district. We have decided to work with our school and district to expose what STEM and robotics offer to younger students. Our main mission is to impact our community and help bring in the new generation of kids interested in STEM principles. By giving opportunities for hands-on experiences with robotics through multiple events. Exposing and inspiring young students to do robotics. In the coming pages, you will see how we have created two service projects and how the chapter executed them.

IDENTIFYING THE PROBLEM

Our chapter wanted to do something worthwhile in our community. We wanted to give back to the community, and most of all, we wanted to make an impact with these thoughts in mind. We started to find a solution to the problem. **First, we must identify the problem itself**. The first thing we did as a chapter was reach out to 64 middle school students, and we had the opportunity to reach out to 55 elementary school kids. We decided to make a simple and straightforward survey. In this survey, we asked the 64 middle school students and the 55 elementary students the same three questions: Are you interested in Robotics? or the option to respond I'm not interested in Robotics, and the last option to respond I have no idea what robotics is. When analyzing the survey results, we had to note that all the middle schools in our district (Omaha Public Schools) have had or have, in some way, a robotics program.



BRAINSTORMING SOLUTIONS

Now, that got the input from the students in that survey. **The second step was to develop solutions to reach out to students and get them interested in robotics.** The chapter had a meeting, and we got together. Everybody pitched ideas on how we could spark the interest of more students regarding robotics. Here are some of the notable ideas that the chapter produced:

- Planning a showcase of robotics in elementary schools
- Hosting a STEM camp during the summertime
- Hosting an open house

Now that we came up with ideas to get more students interested in robotics, we had to come down to ideas that we could execute. The first thing we did was contact an elementary school in our district and ask if we could have a robotics showcase. After hearing back from one school that allowed us to showcase what robotics is to younger students, we decided that would be our first project. The second thing we also did was to start planning the STEM Camp. This big task would require a lot of effort and time, so we started planning early on.

Around April 2023, One of the elementary schools that we heard back from was Ponca Elementary, and with that we got together and thought, how are we going to showcase robotics to these young and impressionable students. That's when we started to plan for that project.

PONCA ELEMENTARY SHOWCASE

With Ponca Elementary being one of the schools we heard back from regarding showcasing robotics to younger students, we acted and planned an interactive, hands-on activity and a presentation of what robotics is. The activity the chapter decided to present to the students was a simple game we produced.

The interactive activity we planned for the elementary students was a simple yet fun game where they could drive a clawbot, and they all had to race each other and get to the end of the line. Then, they had to use the clawbot to pick up a cone from a previous VEX game, In the Zone, and race back to the end to see who won. This game was designed to be simple and quick so that everyone present at the showcase could have a turn driving a clawbot.

PONCA ELEMENTARY SHOWCASE

Below are some pictures of the elementary kids showcasing and presenting robotics and playing the game we planned for them.

Below, you can see various members from our chapter, with the students assisting them and answering questions regarding robotics.

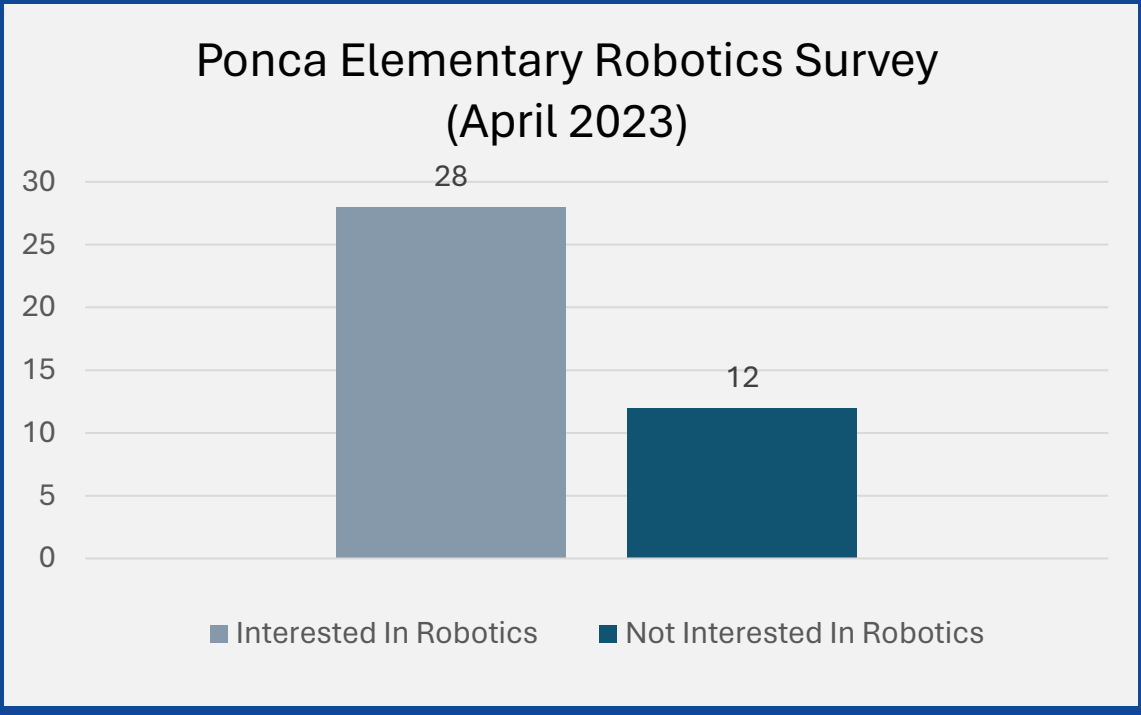
PONCA ELEMENTARY SHOWCASE

Here is chapter member Jonathan. F (1064A) presenting the game and the fundamentals of robotics.

Here is chapter member Ivan. A (1064M in JROTC Uniform) assisting with questions about driving the robot.

PONCA ELEMENTARY REFLECTION

Now that we successfully have completed one of our two goals for trying to bring more interest in robotics. We had to reflect on what we did. The first thing that we did is that shortly after the Ponca Elementary showcase is that we had to chance to take another survey on a group of 40 randomly selected elementary students that were at the showcase. Here were our results:



With this information in hand, we knew that what we were doing was showing progress, but this wasn't all we had planned; after all, this was showcasing to elementary students. We still haven't reached out to students at the middle school level. This is where our second service project comes to STEM Camp. In the next pages, you will see how the chapter plans and executes such a big-level project.

STEM CAMP MISSION / GOAL

Omaha North Robotics hasn't hosted a STEM camp for nearly five years; after COVID-19 hit. The organization hasn't planned it until now. From the beginning, we knew that we wanted to provide something stimulating and fun for the bright minds of the future to do over the summer instead of the younger students being stuck inside playing video games or possibly doing something unproductive during the summer**. The IRHS chapter officials got together and put in a lot of effort to bring the STEM camp together. The biggest reason we chose to come together and make a great effort to make this happen is because we saw many younger students in our community who would like to get into robotics but really don't know where to start.** This summer camp is a great way to get the younger students into robotics and familiarize them with all the basics. Things that were taught to young students by experienced members of our chapter and organization are the principles of competition robotics, such as note booking, using the design process, building, programming, and driving.

Things we went over in the STEM camp were divided into different days or, as we referred to them, "sessions." Typically, each session is an hour long, and every session is different. Concentrating on the different essentials for competition robotics. Here are the different categories for each session that was held.

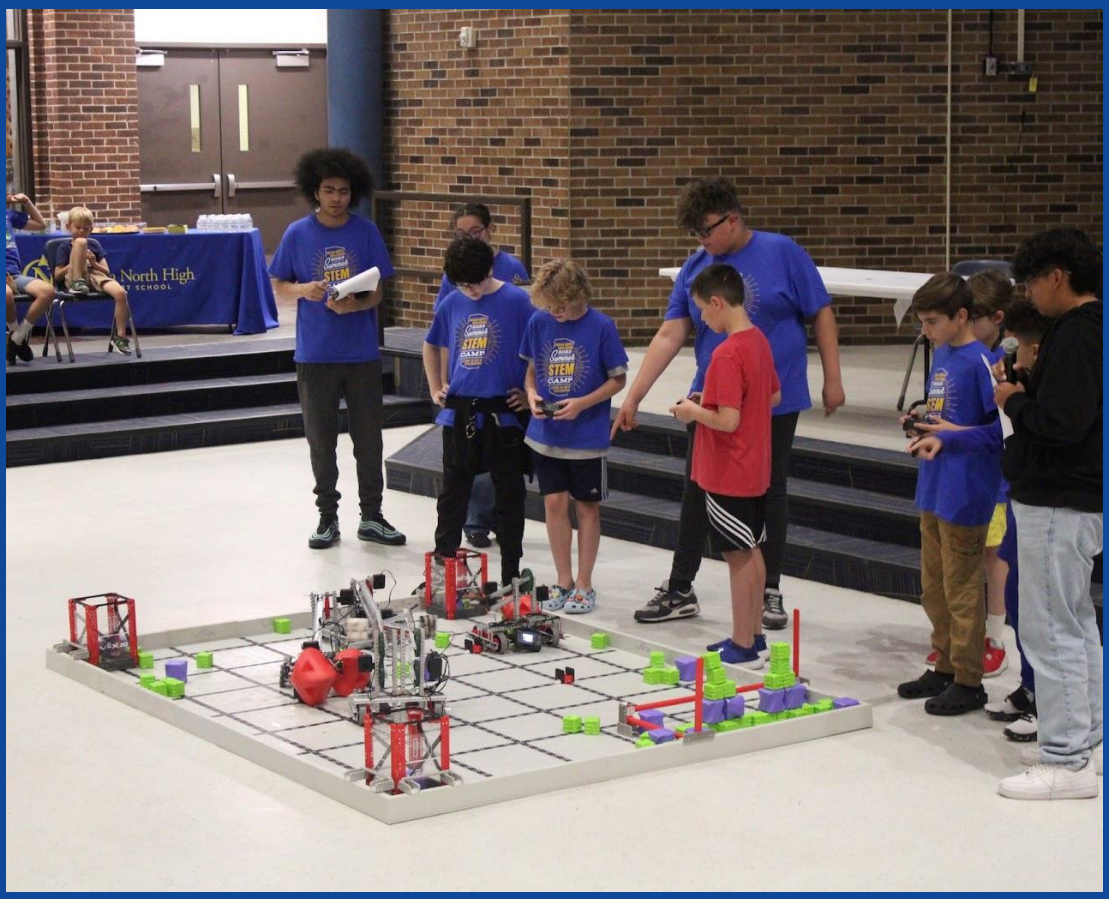
-Programing

-Building

-Robotics in the real world

STEM CAMP INITIAL PLANNING

It all starts with an idea, and shortly after planning. We started planning this event in April, shortly after returning from Worlds. Starting in April, the chapter, working alongside one of our STEM role models and robotics coach, Mr. Wiemer, started getting in communication with school administration and filing all the paperwork needed to be able to use the school facilities during the summer to host the STEM summer camp. We knew we wanted a wide reach of students for this camp, so we tailored it to 4th and 8th-grade students. This was a good age range for kids to pay attention and learn something. **Overall, our biggest strategy when working on making this camp possible is to make it inclusive for people of all skills,** whether the experience be that they have built with Legos or even a full-on robotics competition; the camp was always something new to teach everyone.



SCHEDULING AND LOCATIONS

With three different sessions going on at a day that means that we have three different groups of students moving around. So, we had to plan to keep sessions shorts but effective to keep the mentor to student ration reasonable.

7:30 – Staff arrival time (IRHS members)
8:00 – Campers arrival meet in Viking Center
8:15 – Campers go to the first session
9:15 – Campers move to second session
10:15 – Campers move to last session
11:45 – Take campers outside to wait for families to pick them up

As well as providing the schedule, we had to set a location where the attendees would come in and get picked up. Here is that Location area that was provided to the parents and guardians of the students attending the STEM Camp.

Location of the STEM Camp: Omaha North High School (4410 N 36th St 68111 Omaha, NE)

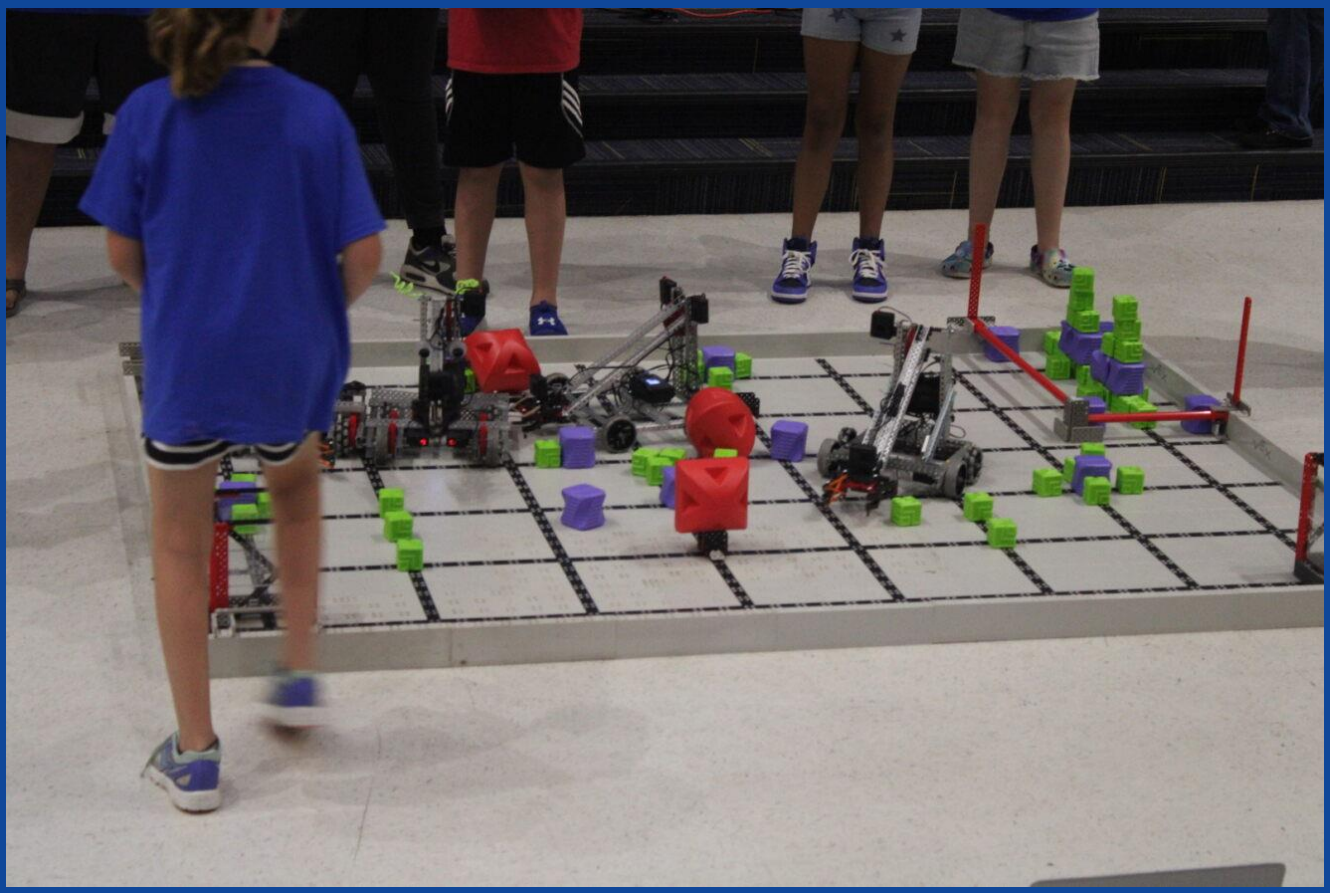
Instructions: Drop off students at front by the flagpole then enter through the main doors.
Areas inside of the school that were reserved for the STEM Camp:
Viking Center *think of the Viking Center as a big open space cafeteria* – Welcome area and Friday's competition area

We had a good amount of space to work with at the STEM Camp. We had 3 different classrooms, and we had a big open cafeteria/commons area to use as a welcome area for the beginning of camp, and to use Friday as the competition area.

Classroom – 131
Classroom – 141
Classroom – 144

STEM CAMP CHALLENGE

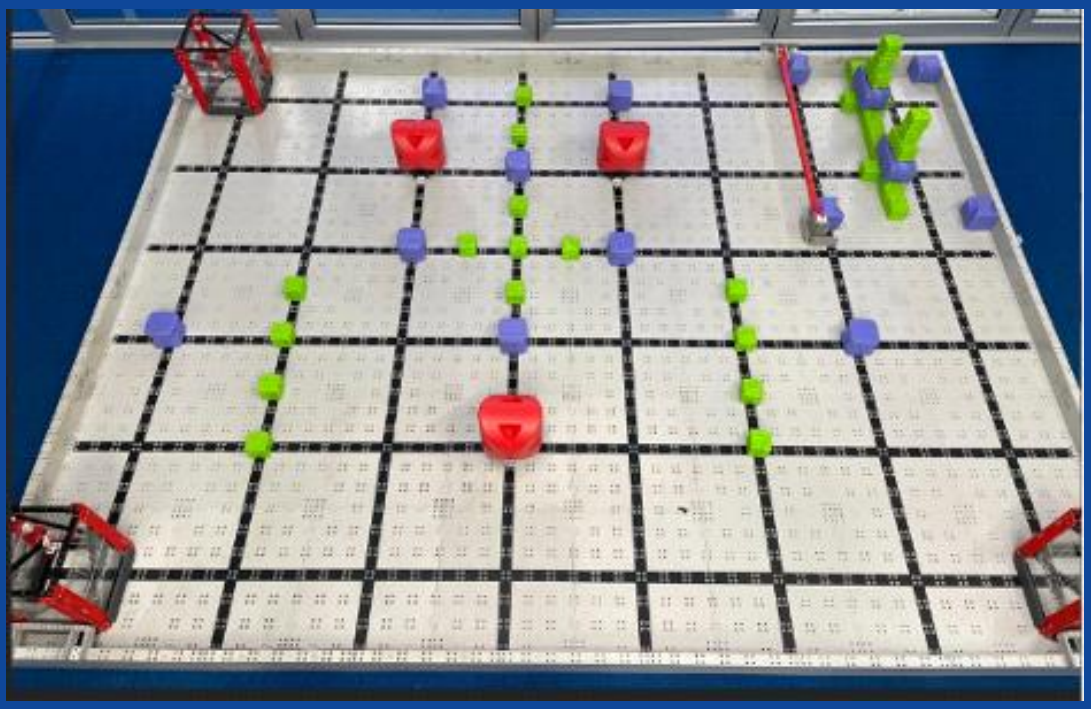
When we were planning, we often found ourselves putting ourselves in the position of a younger student. We wanted to provide a fun and stimulating challenge for the younger students attending the camp. We wanted to provide a game that got the younger students thinking in ways they can overcome the challenge. The challenge was provided with collaboration with the C.R.E.A.T.E [Competitive Robotics Enhancing and Advancing Technology Education] Foundation that provided us with a game that the attendees of the camp can look forward to competing in at the end of the week. The game that is heavily inspired by this years VEX IQ game Full volume. The game that the C.R.E.A.T.E Foundation provided was called Block Buster. Not only were we working with them with coming up with this game they were also using the STEM camp as testing grounds for the upcoming year



Pictured above are STEM Camp students playing Block Buster.

EXPLAINING BLOCK BUSTER

Block Buster, is a robotics competition for students in 8th grade and younger is played on the field shown below which is approximately 6’ x 8’. The Alliances, made up of four randomly paired teams, collaborate to score as many points as possible. Matches are 90 seconds in length. The controller of the robot must be passed from one driver to the other during the match. The object of the competition is to attain a higher combined score than all the other teams. Points are scored by performing tasks with your robot, which can be no larger than 14” x 14” x 14” at the beginning of the match. Scoring is broken down by Mandatory tasks and BONUS Tasks. If all mandatory tasks are completed the teams can elect to set their remotes down and end the match. Any time remaining on the clock is then added to the bonus points earned up to that point.



Pictured above is an image for how Block Buster is set up

ADVERTISING / PROMOTING THE CAMP

To get people interested into going to the STEM camp we need to find someway to reach people that were interested. So, we decided to make a flyer and send it to middle schools in our district as well as middle schools in our local area. Along side that we published these flyers to our schools' social media to spread the event that way. Here is the flyer that we sent out to the schools and that we posted on our schools' social media platforms.

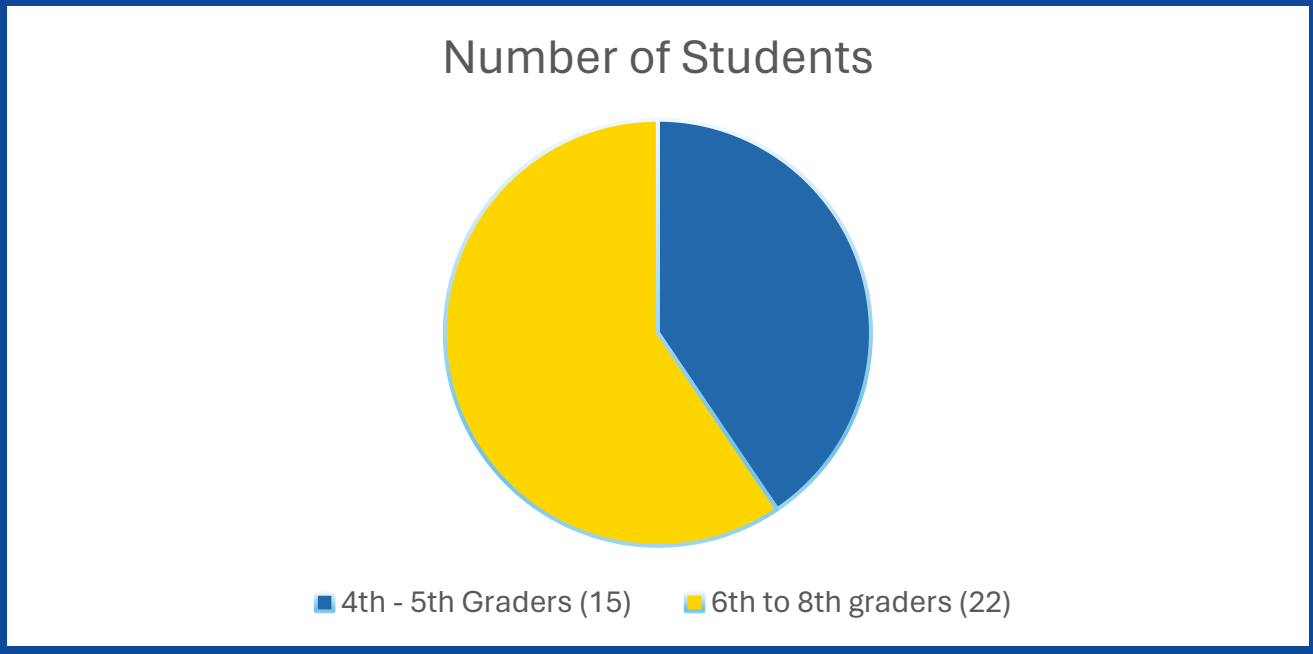
STEM CAMP VOLUNTEERING

With all our planning done, a section of our school was reserved for the camp and a fun game for the students to play. All we had to worry about was volunteers. We had many members of our robotics organization volunteering, but we also needed instructors for the programming aspect of the camp. So, for the programming section, we talked to our computer science teacher, Mr. Henderson, to help us teach students about programming robotics. All the other aspects of camp were accounted for, but the biggest worry was programming. So, with Mr. Henderson on board with STEM Camp. We were set for the project to commence in the summer. We had sufficient volunteers, and **we were ready to make an impact.**

Pictured above is Mr. Henderson

STEM CAMP BY THE NUMBERS

Now that everything that we had to do was all said and done we had to wait for people to start signing up for the camp. Around May 2023 when school was getting ready to end that's when everyone started signing up, we had a turn out of around 37 people combined, 15 signed up for the 4th – 5th grade week and 22 for the 6th to 8th Grade year week, as you can see, we decided to have two weeks each week for the different grade range of students to keep it all balanced. Here is a visual for those numbers.



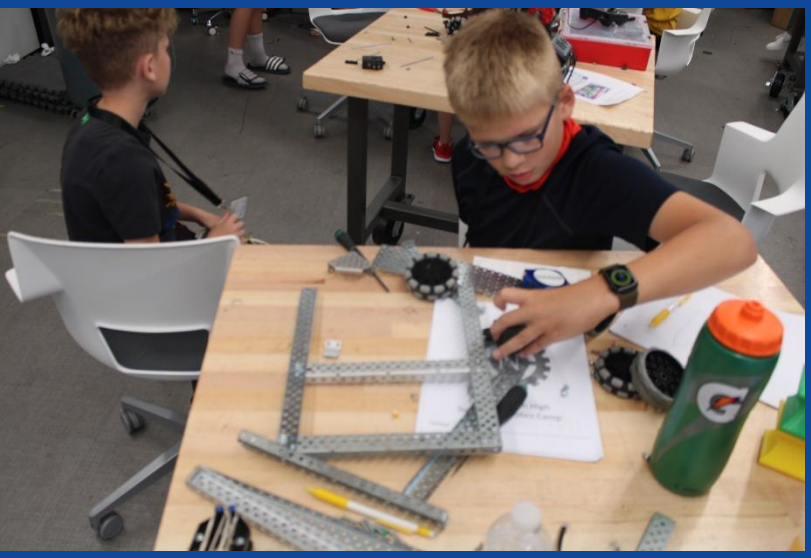
We were really excited with the turn out that we were receiving, this is what were hoping for, and most of all we were so ready for the camp to start to seeing the great impact that we have been planning for.

STEM CAMP WEEK ONE!

The first week of camp comes around and we are so excited to start! The first week of camp is going to be our week for the 4th to the 5th graders and we were excited to show them all that robotics has to offer. Here are some of those pictures that we took during the first week of STEM camp in these pictures you can see the different sessions of camp, Building, and Driving! Something to note about this week is that due to an unforeseen event happening at our school we had to cut the competition short, no worries though! We made up for it with fun robot time!

Pictured here is one of the camp mentors Sara B (1064X) with one of our 4-6th grade students

STEM CAMP WEEK ONE!

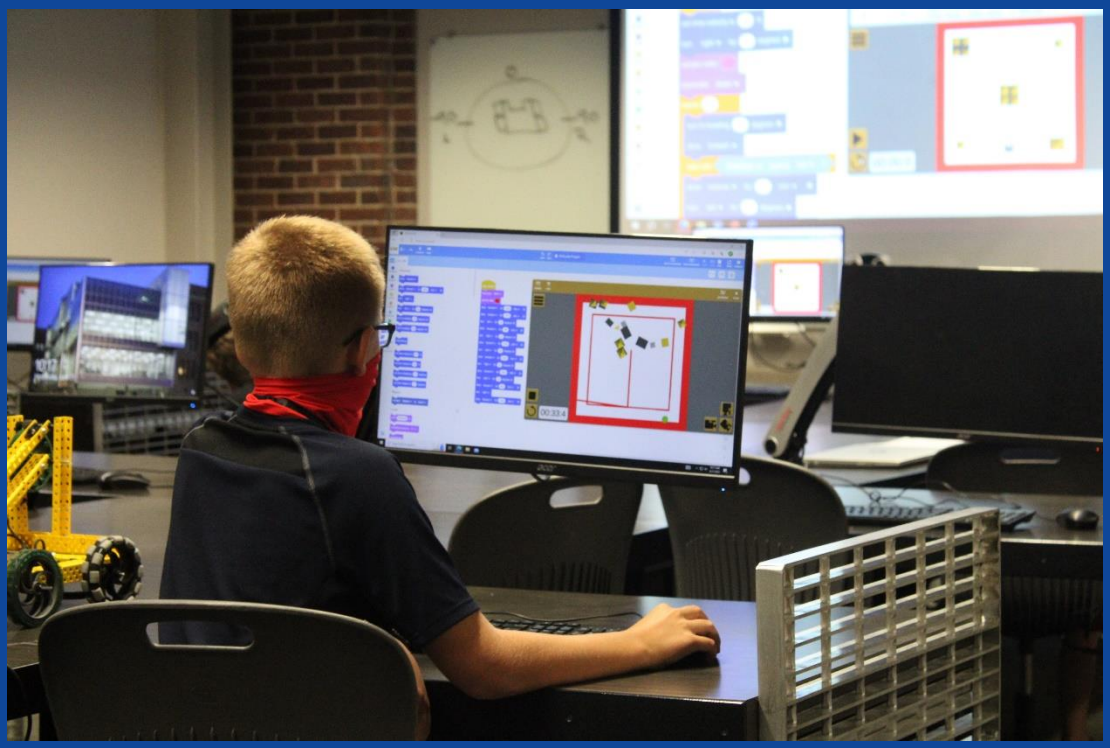


Pictured here is one of our students working with VEX parts to create a drivetrain during the building session, using skills taught by our members, so they can get ready for the competition that was going take place at the end of the week.

Pictured here is Ashley H (1064B), one of the members of our 1064 teams, helping a student with doubts about how to build a drivetrain. Something to note when seeing these images is that we tried our best to teach these students as best as possible.

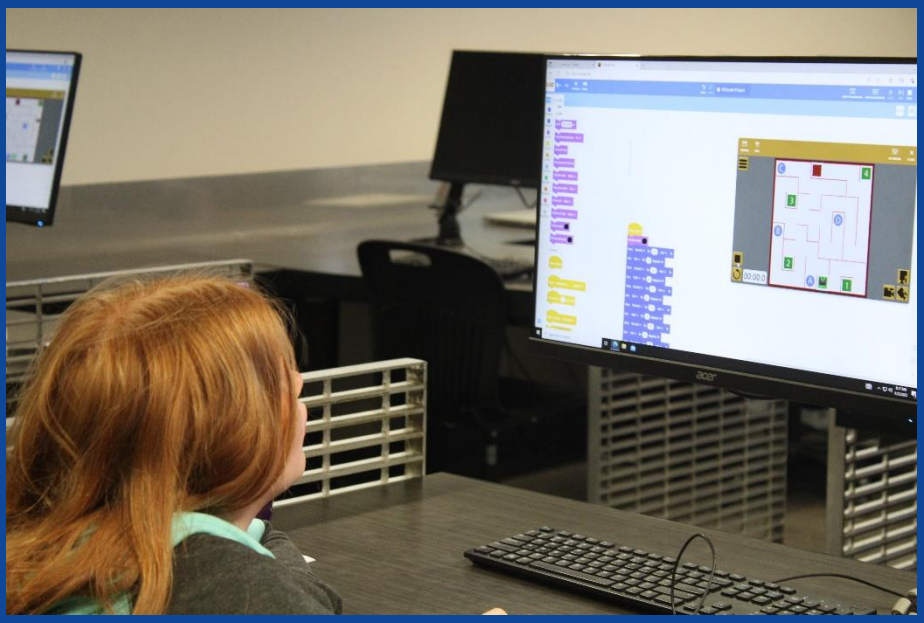
STEM CAMP : PROGRAMMING

In the previous pages, you saw what the building sessions of our STEM camp were like; now, we would like to show what the programming sessions of the camp looked like. When you think of robotics, one of the biggest and most major aspects of robotics is programming. What good is it when you build a robot but cannot program it to do what you want it to do? That's why a big part of the camp's philosophy was to teach our students basic programming skills. We achieved this by using some of VEX's resources, like the engaging VR (Virtual Reality) programming activity that VEX offers online using block code. In these images, you can find how, with the guidance of a computer science teacher in our school, we helped the younger students learn about programming!



STEM CAMP WEEK ONE!

One of our students here is using the online skills platform after she was done with the session, she was asked about what she thought of it, and she said that it was a lot of fun.



One of the biggest things about our session about programming is that we wanted to make sure that everyone was on the same level. So that meant having mentors all around to help everyone.

STEM CAMP WEEK ONE WRAP UP

So, after a long week filled with fun and a lot of learning, the week sadly ended. We were so happy to see that our students had a great time and that they, most of all, saw what robotics offered them. But it wasn't all over yet. We still had week two of STEM camp that we were looking forward to hosting as well, and most of all, we were also looking forward to working with students who were potentially deciding on coming to our school and joining our robotics team. I would like to note that many of our organization's teams are senior teams and are on track to graduate in the 2023- 2024 school year. This is why we wanted to emphasize this week and show them the best of what robotics is so they can join robotics and keep our organization thriving.

STEM CAMP WEEK TWO! (MS)

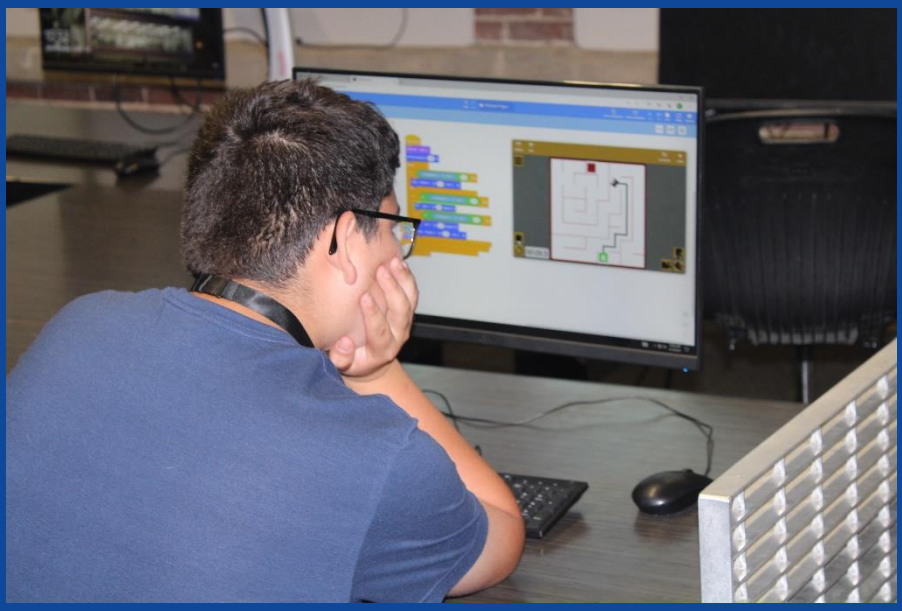
We knew that this was the week we had to make a great impact on our middle school students; these were kids who were potentially in the mindset of joining their local middle school team. Some of these students are even attending high school that year, so we want to solidify their potential ideas of joining a team with this camp and learning experience. In the following pages, you will see much of what the students did during this week.

STEM CAMP WEEK TWO! (MS)

Pictured here is one of our group leaders, Bryton Bower (1064B), sitting down with a student and helping them with questions about building. You can also see that a notebook was used to document the engineering process in this picture.

Here you can see that some of our students have experience with robotics, and here in this picture you can see that one of our students was working with different gear ratios to make a drivetrain.

STEM CAMP WEEK TWO! (MS)

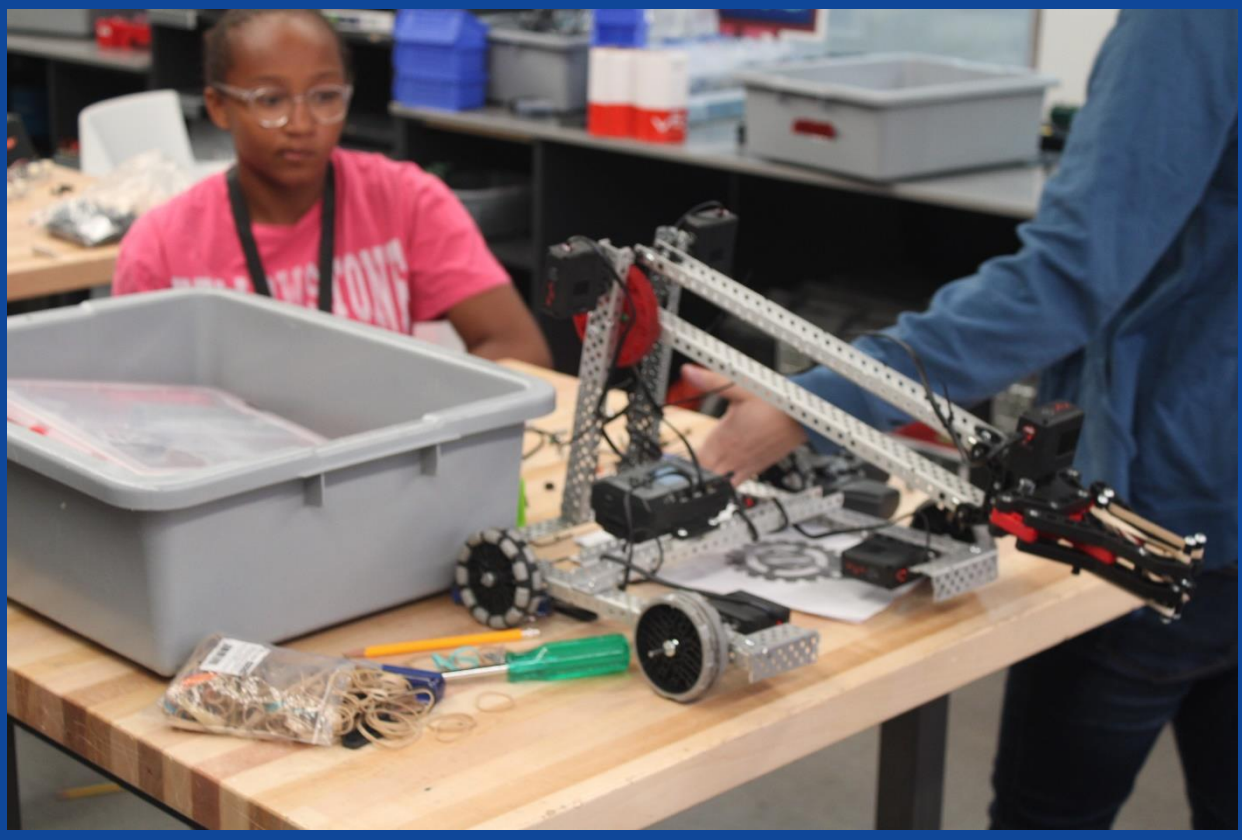


In the same way that we taught our elementary school students how to program using VR skills, we also did the same with our middle school students, but knowing that they had a higher learning capability, we made it more challenging for them.

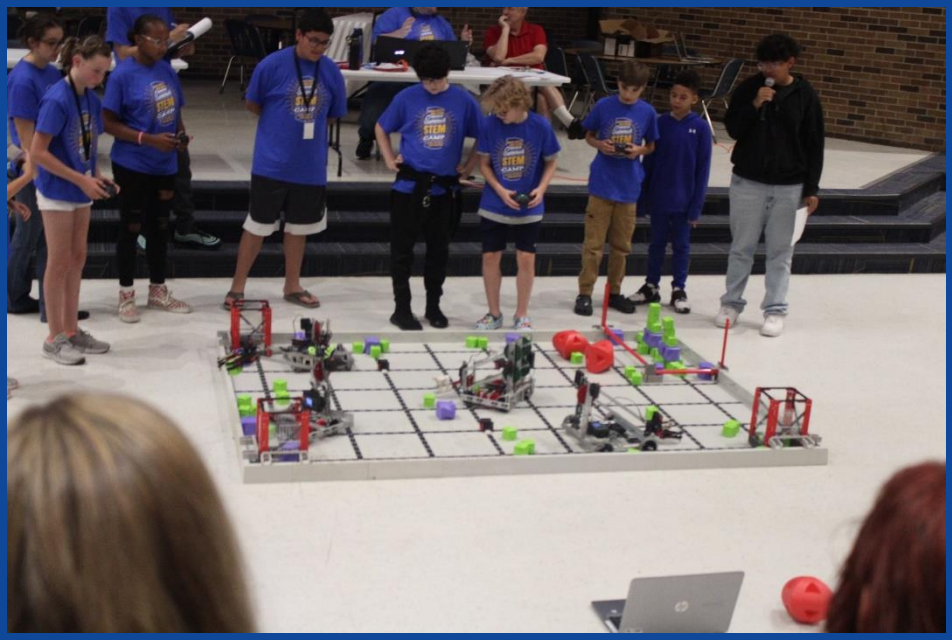
Learning to program was going to be crucial for this week because this was going to be the week that the students would have to put a robot together and program it for the competition that would take place at the end of the week.

STEM CAMP WEEK TWO! (MS)

Here we are, nearing the end of the last week of STEM camp, and it is now time for the part that the students have been waiting on. Competition!! As we explained earlier, the game that the students have been building toward was a game that the Create Foundation helped us bring to the students, Block Buster. From the beginning of the week, the students were told that this was the competition they had to prepare for, so they competed and gave it the best they got. Here are some of the pictures that we took when it came to competition time!



STEM CAMP WEEK TWO! (MS)



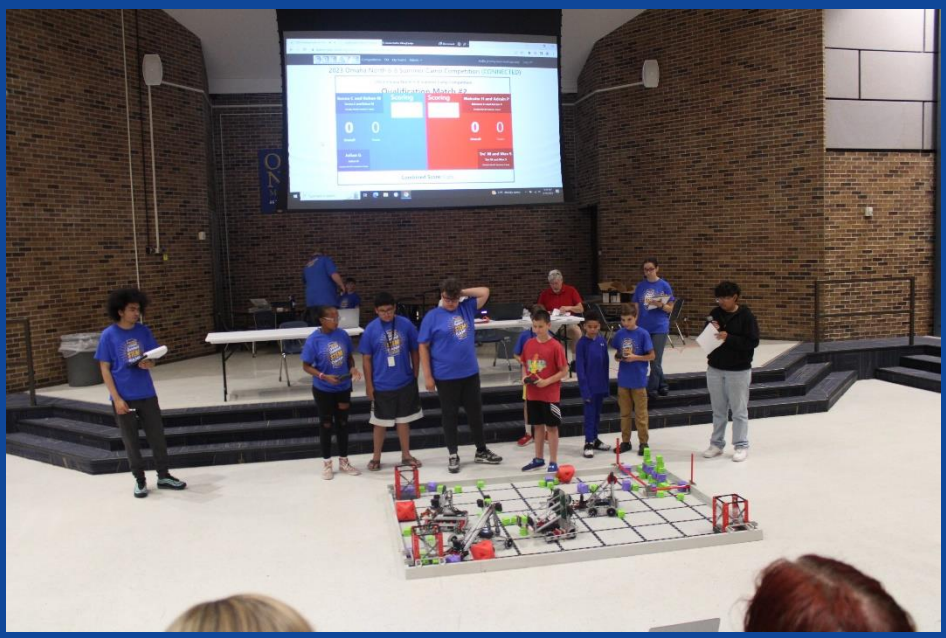
This is the setup we had for the competition; these students worked so hard on their robots all week and were so excited to show off everything they did in this competition.

Here, you can see one of our robotics and one of our STEM role models, Mr. Wiemer, going over how scoring works and talking to the students about other things. We are so grateful for our coach because none of this would be possible without him.

STEM CAMP WEEK TWO! (MS)

To the left, you can see one group of students getting ready to place their robots on the field. For many of these students, this was their first exposure to a robotics competition.

Here, you can see the robots in action. During many of these matches, we saw how many of these students were communicating with each other, and it's amazing to think that, at one point, we were all in their position.

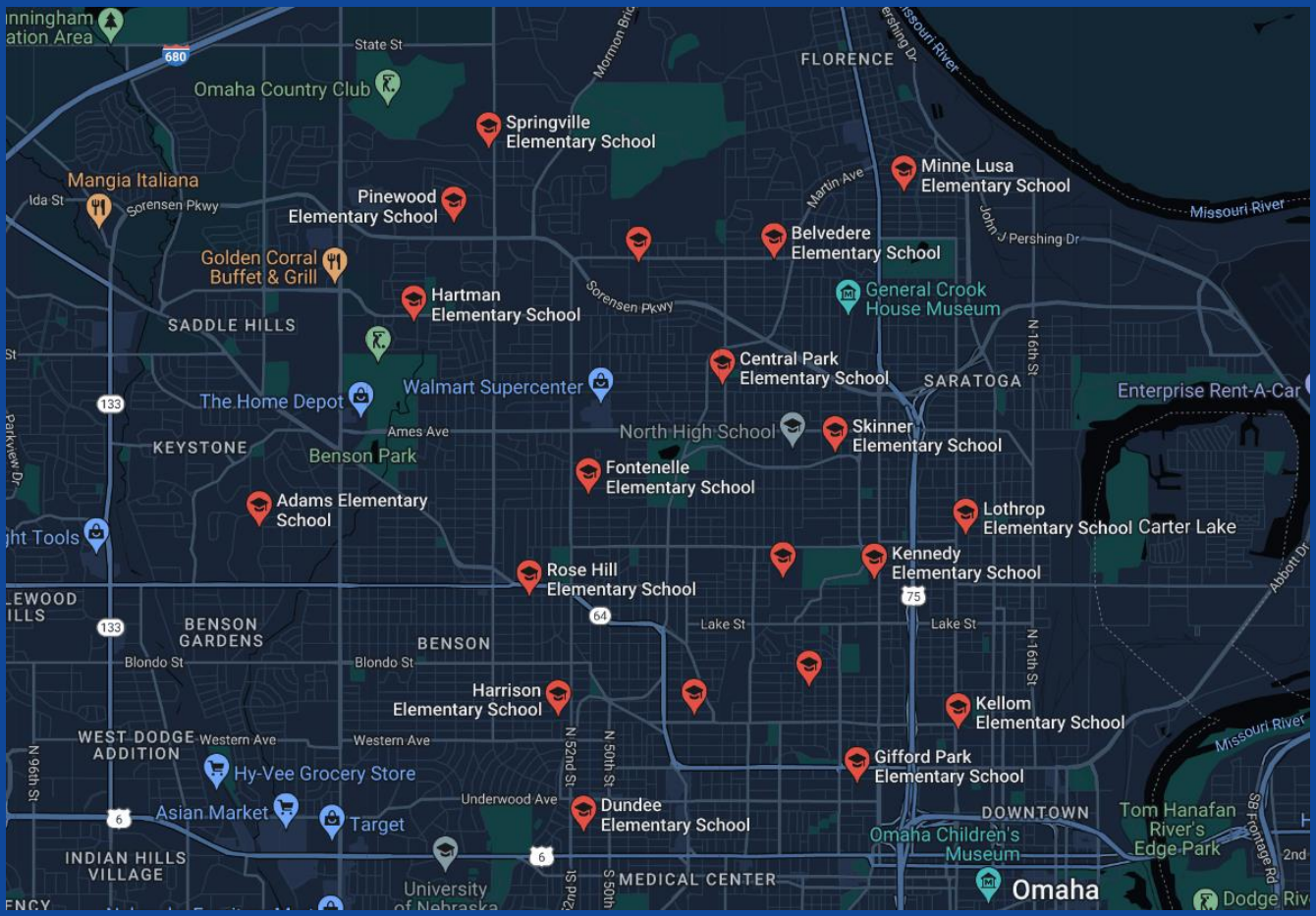


STEM CAMP WEEK TWO WRAP UP

Time flies fast, and just like that, the end of a great two weeks has sadly ended. We are so honored here at North that we were able to offer this great experience to these students. Making an impact on their lives and inspiring them to continue doing robotics. These last couple of weeks have also been a learning experience for us; not only have we improved ourselves as teachers, but we have also learned to pass on what we love the most: robotics. Words can't describe how wonderful this experience was for everyone, and most of all, we are so excited about what we will do in the future! Until then, we will continue doing what we love the most and spreading robotics to everyone. But the good news is that we aren't even done; we just started.

STEM CAMP NEXT YEAR

Our Plan for next year is to expand to gain more attention and stretch into more students' lives. We want to allow more kids to understand and experience the areas of engineering, what they think engineering may mean, and how their answer is different from what it is. Our goal is to reach out to all the elementary schools during the end of the year and talk to the students about talking to their parents about attending our summer camp for the summer of 2024. The schools we would communicate and talk to are shown below. They are the closest elementary schools to our school. This way, we can get more students interested in STEM-related activities.



STEM CAMP NEXT YEAR

When think about recruiting kids for the next camp we want to get them excited about wanting to come to our summer camp. We want to plan fun activities and get the kids engaged in STEM activities and having more rotations for kids to go to.

Ideas for Rooms: (can be modified for grade levels)
- **Medical Innovations?**
- **Robotics**
- **Coding**
- **Teamwork**
- **Mechanical Design / 3D modeling**

Schedule:

5 groups of students (10-15 students max per group & 2-3 volunteers)

- **Volunteers arrive 7:00/7:30 (set up/preparations for the day)**
- **Campers Arrive 8:00/8:30 in Viking Center Showing robotics/STEM videos**
- **Room 1 8:30-9:30**
- **Room 2 9:30-10:30**
- **Room 3 10:30-11:30**
- **Lunch Time 11:30 – 12:00 (Viking Center)**
- **Room 4 12:00-1:00**
- **Room 5 1:00-2:00**
- **Campers Leave: 2:00**
- **Volunteers Leave: 2:30/3:00 after capers pick-up and clean/ preparations for the next day.**

STEM CAMP NEXT YEAR

Ideas for Rooms: (can be modified for grade levels)

- Medical Innovations?
- Robotics
- Coding
- Overall STEM Philosophy
- Mechanical Design / 3D modeling

This is still in the early phase of planning, but having those ideas in mind for what we want to do for our next iteration of STEM camp is important for us. We know this is ambitious, but after seeing how we performed as a chapter in this last STEM camp, we are confident that we can make a bigger impact with this next iteration of the STEM camp.

STEM CAMP CELEBRATION!!

Once again, we were so grateful for our experience at STEM camp. It was draining, though, as most things are. We decided to go about our celebration by hosting a fun and engaging pizza party and by giving out certificates of recognition to all our IRHS chapter members for all the hard work that they have accomplished. We planned to have this event shortly after the end of STEM camp and on a Friday evening. We ordered five pizzas, and Ivan designed the certificates that were handed out to everyone who made STEM camp possible. We would like to thank all our mentors and volunteers who made this dream a reality and greatly impacted the community.

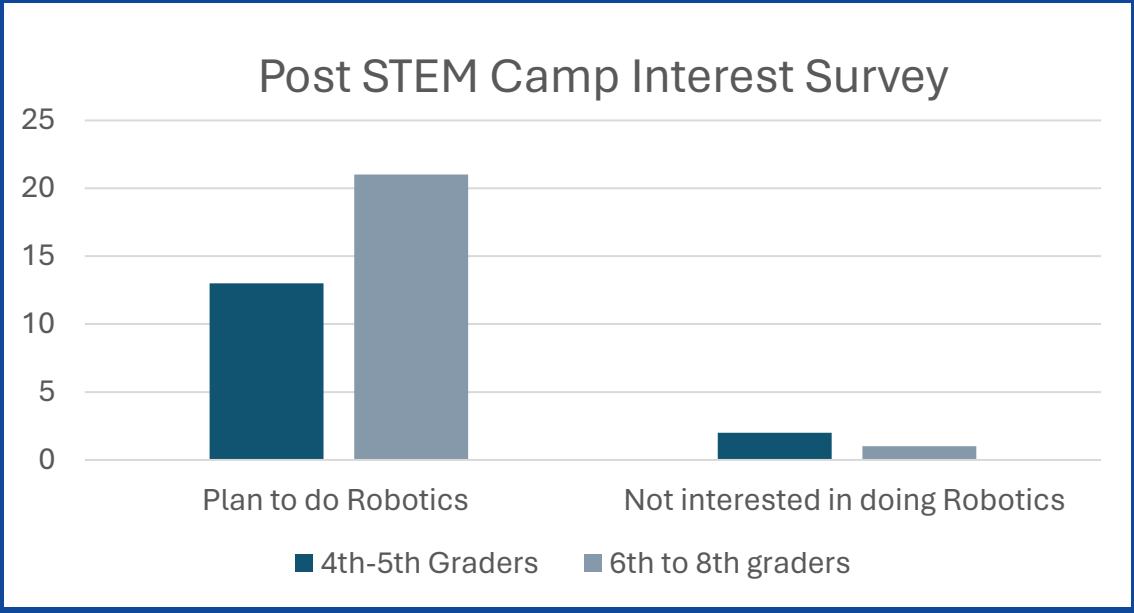
STEM CAMP CELEBRATION!!

One of our STEM role models, Mr. Wiemer, gets some yummy pizza here. Without his and others' help, none of this would have been possible. Thank you, Mr. Wiemer.

Lore Reick (1064X) and Jonathan Flores(1064A) enjoy pizza. We chose this day for our event because we had an open lab day to work on our Over Under robots. After all, we are a competition team, too.

OVERALL REFLECTION/ SUMMARY

We are so happy with all the hard work our chapter, and our members have put in. Looking back at it all, we really wouldn't change a thing. We took on a huge project and executed it with very little hassle. Second is the impact that we have made on our community. The Omaha metro area doesn't really know about robotics, so we are very happy about putting ourselves out there and showing what robotics is all about here at the chapter. To end it all, we had the students who attended the STEM camp do one last survey. This survey asks about their interest in robotics after seeing what robotics has to offer in the STEM camp.



After seeing these numbers, we knew that we did things right. Many of these students were interested in robotics and wanted to keep pursuing it after the STEM camp experience. We are happy with the results and impact we made in our community.

OUR STEM ROLE MODELS

MR.WIEMER

ROBOTICS COACH AND MENTOR

Mr. Wiemer has always been a source of inspiration for the members of our organization. Coaching since VEX Competition Robotics started up with its first game, Bridge Battle (2009-2010), he has been there since the beginning. He loves to share all the knowledge he has gained from seeing and experiencing everything VEX offers. He has always been inclusive regarding people coming into robotics, whether it is your first year ever doing robotics or you're coming from a middle school where you already did robotics, Mr. Wiemer doesn't turn anybody away. He has been awarded multiple awards for being a great example of what a robotics coach should be. This is why he is one of our many STEM role models.

Here is Mr. Wiemer holding his Coach of the Year award for his great work in our program and always being a great friend to rely on.

OUR STEM ROLE MODELS

MR. HENDERSON

COMPUTER SCIENCE TEACHER AND ROBOTICS JUDGE

Mr. Henderson is someone that we deeply admire for everything that he has done for our robotics club. Although he is not always directly involved in our robotics club, that doesn't stop him from always being helpful and resourceful to us and everyone, especially when we have a question about programming and things related to his field. He is also one of our robotics judges, so whenever we need his input on our notebooks, he is there to judge them and give us feedback. He is always there to help. He is always inclusive, encourages people to try new things, and never turns anyone away when it comes to getting help. This is why Mr. Henderson is one of our STEM role models.

Thank you, Mr. Henderson! Mr. Henderson has been one of our computer science teachers at North for a long time. He is also a University of Omaha, Nebraska (UNO) professor.

OUR STEM ROLE MODELS

MRS. RUNYON

ROBOTICS COACH AND MENTOR

Mrs. Runyon has helped the chapter in many ways, and we truly appreciate everything she has done for us. She has been coaching robotics for over 15 years and is the go-to person for robotics. Mrs. Runyon received last year's Coach of the Year award at the C.R.E.A.T.E Open competition. She has always pushed for a more inclusive organization, always encouraging people to try out robotics no matter what. She has shown how valuable she is to our organization, which is why she is one of our STEM role models.

Pictured above is Mrs. Runyon receiving the Coach of the Year award. Thank you, Mrs. Runyon, for being an amazing mentor and coach!

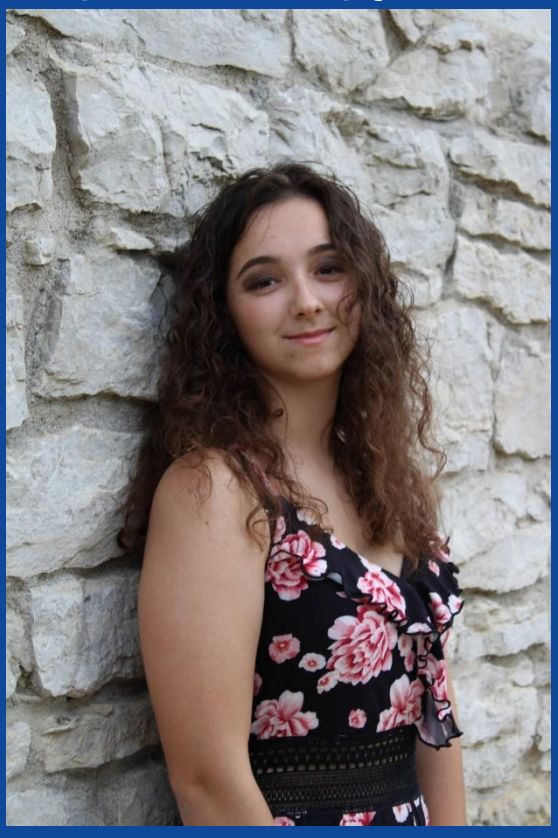
STUDENT REFLECTIONS: ASHLEY

The STEM camp that Omaha North hosts has been a big part of my life for almost a decade. I attended the camp for almost 5 years when I was younger. Norths STEM camp sparked my interest in robotics. This year was the first time that I was able to help kids in my community create similar memories that I had growing up. I was able to share what I know with a younger generation so that they can gain knowledge about robotics and engineering. This opportunity allowed me to feel like I'm making a difference in not just the present but in the future as well. If this STEM camp inspired me to join robotics, I think that this year's STEM camp will do the same to other students.

– Ashley Hankel, Senior, 1064B

STUDENT REFLECTIONS: SARA

Hello, I've been VEX for about 3.5 year. In 8th grade I joined my middle school's robotics team halfway though the year then we went on spring break and never came back to have the end of the year robotics party. When I started high school, I didn't think to much about joining robotics my freshman year of high school with covid happening and being new to high school. I Joined robotics my Sophomore year when a friend from middle school asked me to join. I have been In robotics ever since and have learned a lot. It was a very insightful experience to help plan the summer camp for the elementary and middle schoolers. I have never helped plan anything that big before and it was a fun experience and to see all the hard work pay off seeing smiles on the kids faces. I can't wait to plan help plan the summer camp for this up coming summer. I know the kids are going to have a lot of fun and I can't wait to help them want to join their school's robotics camps and maybe eventually join Norths Robotics. – Sara Bascom, Senior, 1064X



STUDENT REFLECTIONS: IVAN. A

Hi! Hola! My name is Ivan Aviles. I'm the one who put this portfolio together. I'm a first-generation Mexican American, making a difference by being a Latino in STEM. I love VEX robotics and have dedicated my life to it for five years. I started during my 8th-grade year in middle school, and I'm going on my senior year doing robotics. Being a part of this chapter has taught me many things, and I am still learning to this day. Working at the STEM camp was one of my greatest achievements, and even more, because I am a part of the officers who planned the project, and I'm a part of a team that will leave our mark by already planning the projects for next summer. Thank you, the reader, for reviewing our chapter submission, and I hope this has brought you as much joy as it did to us after seeing all the efforts, the work we do, and the impact we create in our community. Its all about gaining momentum. – Ivan Aviles Sebastian, Senior, 1064M

1064M
MOMENTUM

LETTER OF VERIFICATION

North High
Est. 1924

January 26, 2024

To Whom It May Concern:

This statement is to verify that the North High Schools International Robotics Honor Society Chapter worked as mentors and activity directors for the 2023 Summer Robotics STEM Camp from June 12th to June 16th for 5th - 6th grade students and then again on June 19th to June 23rd for 7th and 8th grade students. The summer camp consists of two week-long camps led by the International Robotics Honor Society Chapter and robotics students. The camps gave several K-8th grade students the opportunity to explore various aspects of Robotics, Engineering and Computer Programing.

The International Robotics Honor Society students also participated in a Science Fair Showcase for a local elementary, Ponca Hills Elementary. The students shared their experience in robotics with the elementary students, demonstrated driving a robot and then assisted the students as they took turns operating the robots.

If you have any questions or concerns regarding these events, please feel free to contact me at 531.299.6948.

Sincerely,

Collette L. Nero

Collette L. Nero, Ph.D.
Principal

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