



BOEING HELENA

2024 SUMMER

# Machining Student Development Program



BUILDING SKILLS FOR  
IN-DEMAND CAREERS

# TO OUR COMMUNITY

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We are excited to share with you the Boeing Helena 2024 Machining Student Development Program Yearbook!

This past summer, 11 students from Capital High School, Gallatin College, and Montana Tech at Highlands College took significant steps in developing their hands-on skills and exploring advanced manufacturing careers at Boeing's Helena facility. Over six weeks, these students demonstrated remarkable passion and commitment. In addition to learning about fabrication and machining, they built essential skills applicable to any career pathway, including teamwork, communication, and networking. They also gained an understanding of the importance of safety and quality in all their endeavors.

Through hands-on learning, job shadowing, resume development, and mock interviews, these students gained valuable experiences that will give them a competitive edge as they pursue in-demand careers at Boeing and other industry employers, apprenticeship programs, certificates, or college degrees. We couldn't be prouder of them; they represent the future of Montana's manufacturing industry!

Inside this yearbook, you'll discover more about the skills these students have acquired, the projects they've completed, and their career aspirations.

We also want to express our gratitude to the entire Boeing Helena team for coming together to provide these students with this incredible opportunity. Their dedication to offering hands-on experiences is helping prepare these students for successful futures in aerospace and advanced manufacturing.

We hope that learning about these students' skills and goals inspires you as much as it has inspired us, and we can't wait to see where they take their skills next!

Best regards,

*Peter Johnson*

**Peter Johnson**

Vice President and General Manager  
of Fabrication  
BOEING COMMERCIAL AIRPLANES

*Essentia Rivera*

**Essentia Rivera**

Senior Manager, Workforce Development  
BOEING COMMERCIAL AIRPLANES



**SCHOOLS REPRESENTED**

HIGHLANDS COLLEGE

CAPITAL HIGH SCHOOL

GALLATIN COLLEGE

**BY THE NUMBERS**

3



schools represented

2



Helena, MT sites  
(Boeing Helena and Helena College)

7 weeks



11



students

296



hours of manufacturing training and skill development per student



# THANK YOU

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Thank you to our Boeing Helena Machining Student Development Program partners! You are helping provide students with hands-on experiences that will prepare them for Montana's future advanced manufacturing careers.

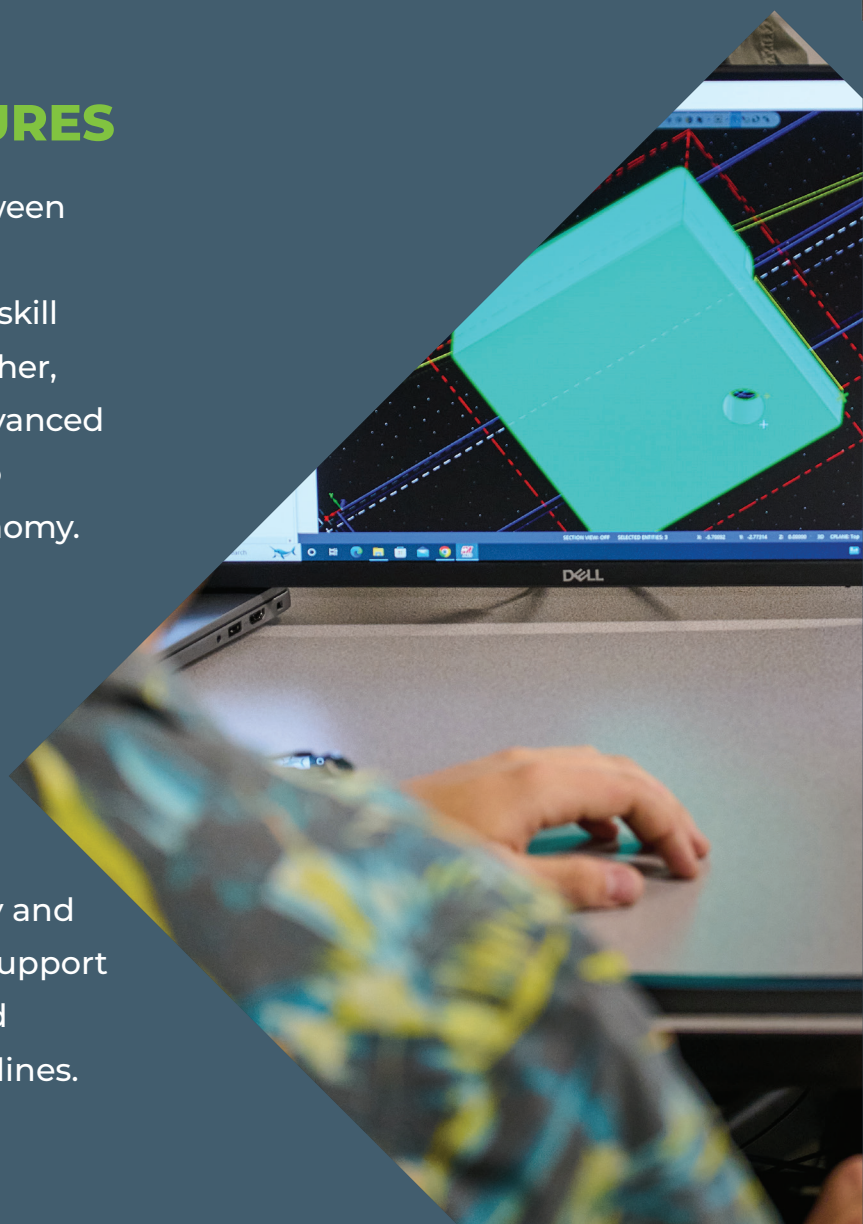
BCA Fabrication  
Boeing Helena  
Helena College  
Boeing Production Systems Training  
Boeing Global Talent Acquisition - HR for Staffing  
Boeing Badging & Security  
Monument Consulting  
PDS Defense  
Strategies 360  
Nathan Norby  
Chance McLaren

## MANUFACTURING FUTURES

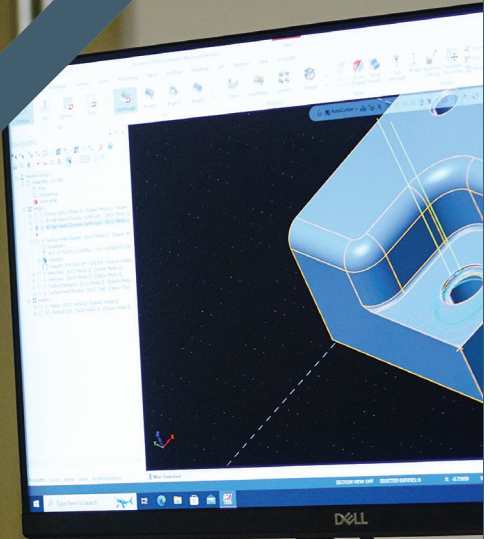
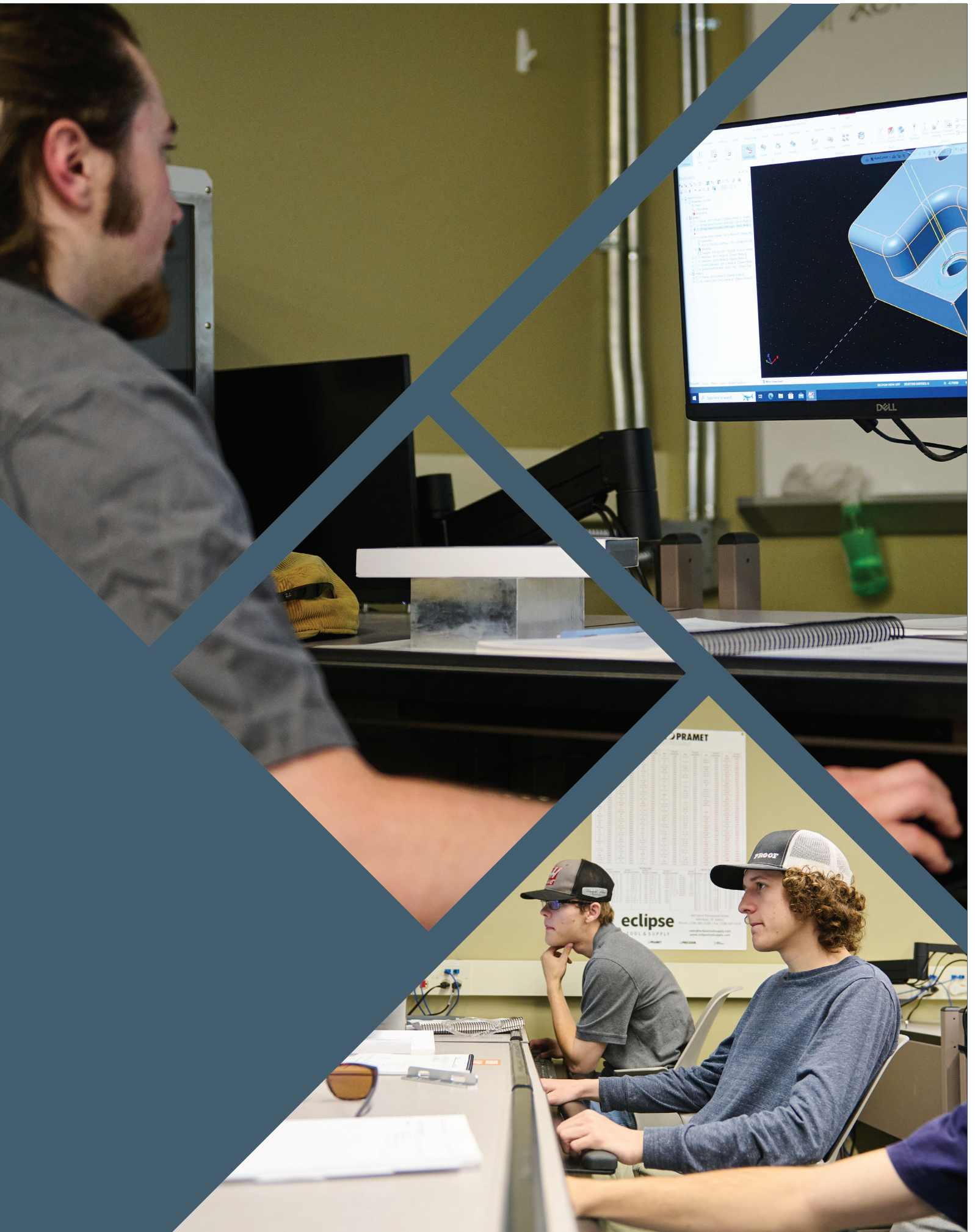
Manufacturing Futures is an effort between industry, high schools, community and technical colleges, and other hands-on skill development programs. Working together, our goal is to elevate aerospace and advanced manufacturing, put people on a path to rewarding careers, and bolster the economy.

## BCA WORKFORCE DEVELOPMENT

Boeing Commercial Airplanes (BCA) Workforce Development partners with high schools, skills centers, community and technical colleges and the military to support the development of skilled, diverse and sustainable manufacturing talent pipelines.









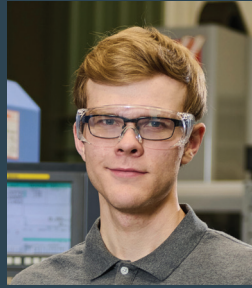
# PARTICIPATING STUDENTS



**Ryan Ashley**  
Capital High School  
MACHINING



**Cooper Burrows**  
Highlands College  
MACHINING



**Allen Christopher**  
Capital High School  
MACHINING



**Jack Henley**  
Gallatin College  
MACHINING



**Logan Lysager**  
Capital High School  
MACHINING



**Tyler McMahon**  
Capital High School  
MACHINING



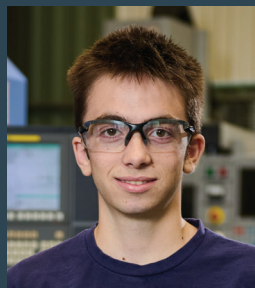
**Cameron Nix**  
Highlands College  
MACHINING



**Andrew Pravecsek**  
Capital High School  
MACHINING



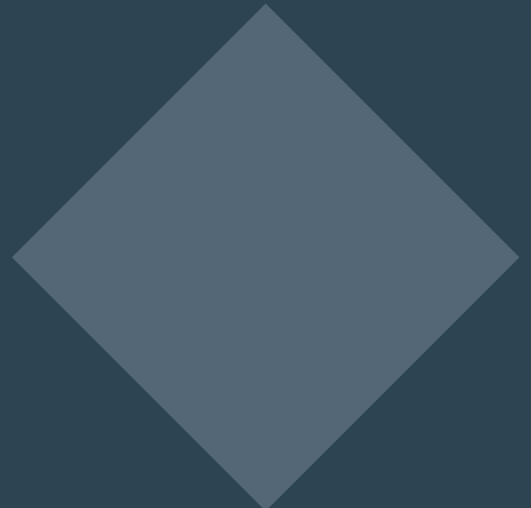
**Benjamin Steine**  
Highlands College  
MACHINING



**Augustus Swant**  
Capital High School  
MACHINING



**Zach Teplitzky**  
Gallatin College  
MACHINING









# MACHINING



## RYAN Ashley

High School Graduate looking to learn as much as possible.

Capital High School

## Computer Science / Machining

**Residence:** Helena, Montana

**Target Work Location:** Northwest United States

Graduated in 2024

### MY NEXT 3 YEARS:

Studying for a Bachelor of Science in Computer Science at Whitworth University in Spokane, Washington.

### MY LONG TERM GOAL:

Currently I am planning to get a BS in Computer Science and work somewhere in the machining or manufacturing industry. I might obtain a 2 year machining degree as well.

### ASK ME ABOUT:

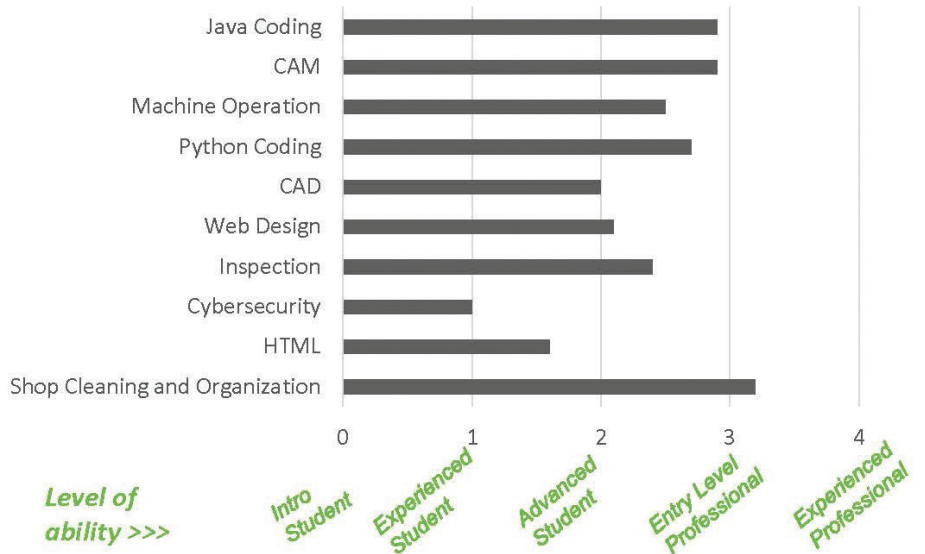
- The various machining projects I did in High School machining class
- Anything about volleyball or tennis
- My future plans
- My dogs

### SKILL CHART:

Most Interested

Level of interest >>>

Interested



### SKILL HIGHLIGHTS

#### Machining and CAD/CAM

For the past 2 years, I have worked with Haas mills and lathes on many different projects from model mountain ranges and engine blocks to fishing rods and hunting knives. I designed and programmed all of these projects myself through Mastercam and Fusion 360.

#### Computer Science

For the past 3 years I have been studying various different concepts in computer science. This includes the languages such as Python, Java, and HTML. I also have a basic understanding of Cybersecurity and web design.

### Model V8 Engine Block

#### Tools and Materials:

½ inch, 3/8 inch, and ¼ inch end mills; #3 center drill; 6061 aluminum

#### Skills Used:

CAD, CAM, advanced fixturing, 4<sup>th</sup> axis programming and machining.

#### Challenges:

Holding the part, minimizing vibration put into the part, 4<sup>th</sup> axis programming, and choosing the right tools.

#### Outcome:

The engine block turned out great; good surface finish and efficient run times.



### PROJECT HIGHLIGHTS

### NASA Butterfly Hinge

#### Tools and Materials:

½ inch, ¼ inch and 1/16 inch end mills; ½ 90 degree counter sink; ½ inch pressure rod; NASA certified aluminum round stock.

#### Skills Used:

Following instructions to the tea, in process inspection, advanced CNC machine operation.

#### Challenges:

Very tight tolerances, advanced fixturing, small tooling, and advanced setups.

#### Outcome:

Very good with two perfect parts.



# MACHINING



## Cooper Burrows

## Metal Fabrication

Metal Fabrication student looking for opportunities to learn and work.

**Residence:** Hamilton, MT

**Target Work Location:** Montana, Utah, Or similar locations.

**Most Recent School:** Highlands College

**Graduated / Graduating in 2025**

### MY NEXT 3 YEARS:

Graduating Highlands with an Associates in Metal Fabrication, finding a decent job that I can get a small house with.

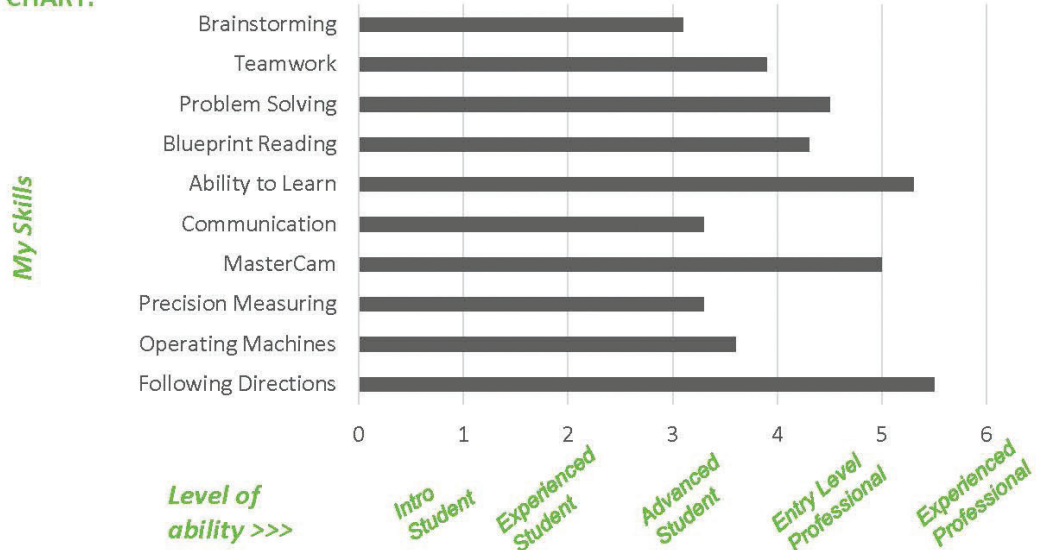
### MY LONG TERM GOAL:

My long term goal is to find a well paying job close to family in Montana or Idaho and work there till retirement.

### ASK ME ABOUT:

- Running
- House projects
- School projects

### SKILL CHART:



### SKILL HIGHLIGHTS

#### Welding

I did have a certificate for V-groove for arc welding in the flat position and can weld pretty well in the horizontal position. I can weld sheet metal with a MIG welder and am willing to improve my skills in this field.

#### Problem Solving

Figuring out issues in a project or something that failed and trying different things to fix it.

### Front Bumper

#### Tools and Materials:

Angle Grinder, 220amp Arc Welder, 6011 Welding rod, and Move Bumper Template.

#### Skills Used:

Welding, Using an angle grinder, and measuring

#### Challenges:

Filling gaps, Damaged driver side front fender, and attaching the parts in a position that matched the other side while still functioning as intended.

#### Outcome:

A functioning and decent looking front bumper.



### PROJECT HIGHLIGHTS

### Aluminum Coaster

#### Tools and Materials:

½ inch endmill, ½ inch ball mill, #3 spot drill, and file.

#### Skills Used:

Programing on Mastercam and running a HAAS MiniMill.

#### Challenges:

The program read the bottom side completely wrong and would undersize it in different directions each time it cut. Had to reprogram the bottom for it to work properly.

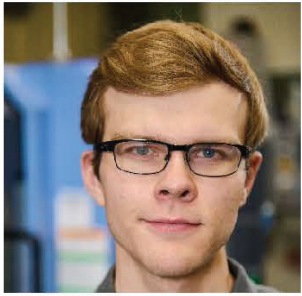
#### Outcome:

Two separate coasters that have detailed images and are within specifications.





# MACHINING



## Allen Charles Christopher II

## Machining / Manufacturing

"Ambitious in my career, hopeful for the future."

**Residence:** Helena, MT

**Most Recent School:**  
Capital High School, Helena, Mt

**Target Work Location:** Boeing or anything relating to Machining/Manufacturing

**Graduated in June 2024**

### MY NEXT 3 YEARS:

In my next three years I plan to attend Helena College for an Associates Degree in CNC Machining Technologies and hopefully be hired into the Manufacturing workforce at Boeing.

### MY LONG TERM GOAL:

In the next 3 – 10 years I wish to still be pursuing the Machining and Manufacturing industry and working towards an engineering degree.

### ASK ME ABOUT:

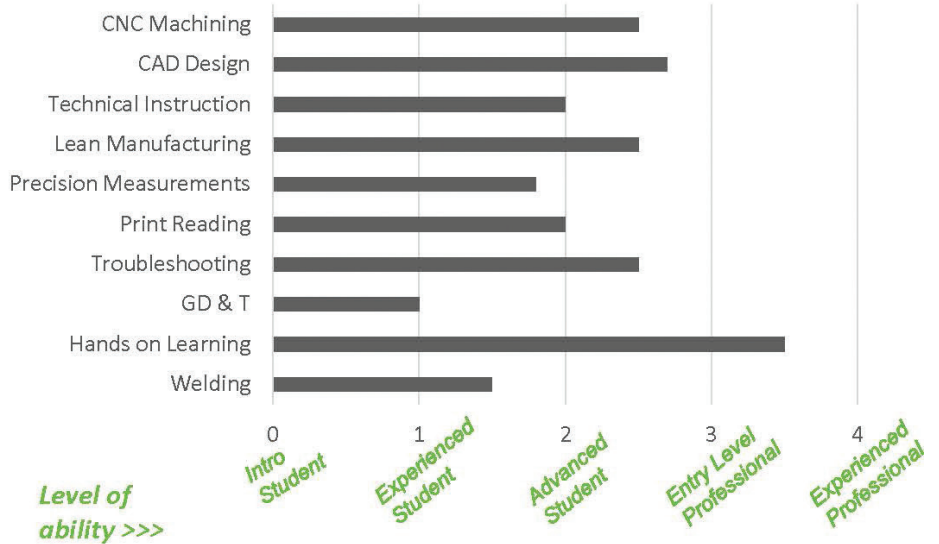
- Machining! Both Manual and CNC Manufacturing!
- Welding Fabrication!
- What my future entails. (I am a Big Planner!)
- Paleontology Sciences!

### SKILL CHART:

Most Interested

Level of interest >>>

Interested



### SKILL HIGHLIGHTS

#### Creative Fabrication:

Whenever I plan to build anything or fabricate a project, I always try to aim for a creative design, shape, and purpose. Functionality usually comes second, depending on the project but I always care about aesthetic of what I make.

#### Detail Focused:

I rarely go into a major project without planning most of, if not all, the steps necessary for the project. The process can gradually change and adapt to circumstances but I start with a general layout with lots of details and specific processes in mind.

### Big Hearts Under the Big Sky – Firepit and Grill Donation Project.

#### Tools and Materials:

I used general mild-steel and a basic MIG or GMAW welder throughout the process. All steel was salvaged scrap.

#### Skills Used:

- Creative Fabrication
- Problem Solving Skills
- Planning and Procedure Skills

#### Challenges:

The firepit was initially suppose to come apart and fold down for ease of use on the road. However, both the look and ease-of-use of the project was not coming together properly so I had to shift gears and redesign the base and overall functionality.

#### Outcome:

In the end a very nice project was the result, it was no longer able to disassemble in any way. However, it did not need to, it was able to raise 350\$ for the Big Hearts Under the Big Sky Charity in 2023 and is among one of my favorite projects.



### PROJECT HIGHLIGHTS

### Custom Desk -w- Back-Frame

#### Tools and Materials:

General Mild-Steel, Butcher Block Counter Top, Wood Stain, Paint. General Tools

#### Skills Used:

- Creative Fabrication
- Problem Solving Skills
- Persistence and Planning

#### Challenges:

The major challenges I experienced was just making sure that everything was square and aligned properly since I planned the project in two different locations. Mainly stud location was the concern during the fabrication of the supporting desk frame.

The room the desk was installed in was also not perfectly square so some workarounds and touch-ups had to be made to finish it off and fit it correctly to the space.

#### Outcome:

In the end, I made a fully custom desk from scratch that I was able to enjoy for days to come.





# MACHINING



## Logan Lysager

A machinist looking for a future in the industry of machining

Capital High school

## Machinist / Manufacturing

Residence: Helena, Mt

Target Work Location: Montana, Colorado, Oregon

Graduated in 2024

### MY NEXT 3 YEARS:

Develop a strong resume through hard work and dedication to learning all that I can.

### MY LONG TERM GOAL:

Own a home by 25 by committing to saving and budgeting while working on furthering my knowledge in the world of machining through collage and free courses

### ASK ME ABOUT:

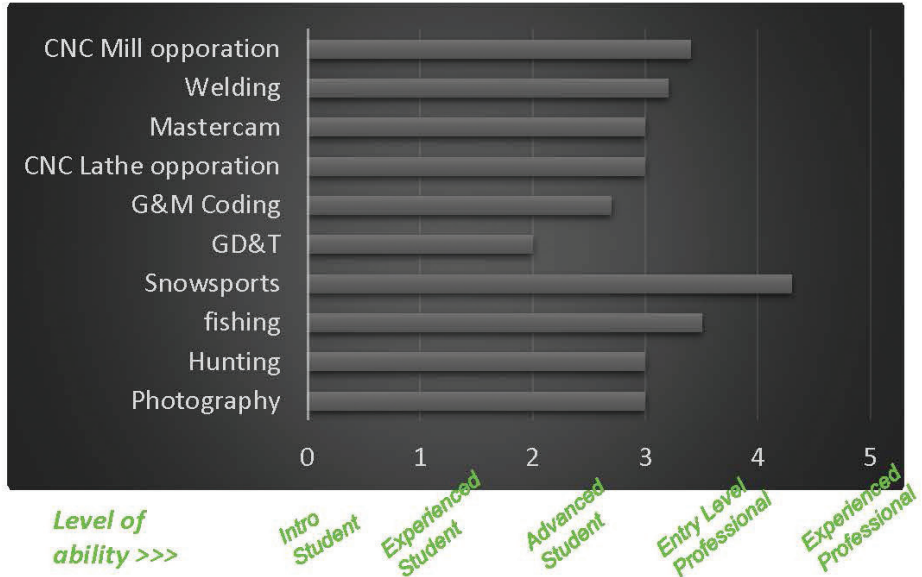
- Snowboards
- Hammock stand project
- Duck hunting
- Wallet project

### SKILL CHART:

Most Interested

Level of interest >>>

Interested



### SKILL HIGHLIGHTS

#### CAD/CAM

I've worked with Mastercam for 3 years Drawing and programing on CNC mills and lathes programing up to 4<sup>th</sup> axis machining on a mill. Along with 2D and 3D machining. Along with making custom fixtures. I'm also a certified Haas mill operator

#### Welding/Fabrication

I took 3 years of welding at Capital High, I made a custom game cart and hammock stand using CAD to make designs then using a verity of machines and tools to complete the projects such as a CNC plasma cutter, tubing bender, GMAW welders, hydraulic sheer, and bandsaws.

### Custom Hammock Stand

#### Tools and Materials:

GMAW welder, CNC plasma cutter, hydraulic sheer, band saw, Mastercam tape measure, protractor. Steel tubing, sheet metal.

#### Skills Used:

Cad solid modeling, Cad dimensioning, welding, pipe coping, CNC programing

#### Challenges:

Precision fitting and bending to correct angles, reinforcement to reduce flexing, proper fixture to hold hammock up and away from frame.

#### Outcome:

Strong lightweight frame with beautiful details at a comfortable and easily accessible height.



### PROJECT HIGHLIGHTS

### Custom fly rod

#### Tools and Materials:

Haas 4<sup>th</sup> axis mill, Haas toolroom lathe, manual lathe, dial calipers, micrometers, Mastercam. Aluminum, cork

#### Skills Used:

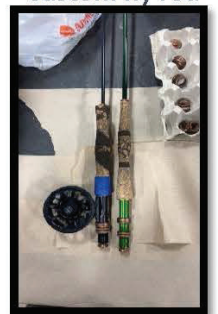
Cad programing, Cad modeling, machine operations, CNC programing

#### Challenges:

Precision threading, interior boring, 4<sup>th</sup> axis programing

#### Outcome:

Ergonomic custom 4wt fly rod with personalized engraving



# MACHINING



**Tyler  
McMahon**

**Machining/Welding**

Manufacturing makes the world turn.

**Residence:** Helena, Montana

**Target Work Location:** Engineering At Boeing

**Capital High School**

**Graduated June 2024**

## MY NEXT 3 YEARS:

In my next three years I plan on pursuing a degree in Mechanical Engineering at MSU Bozeman.

## MY LONG TERM GOAL:

For my long term goal, I plan to work at Boeing as a Mechanical Engineer working in tooling and with CAD design.

## ASK ME ABOUT:

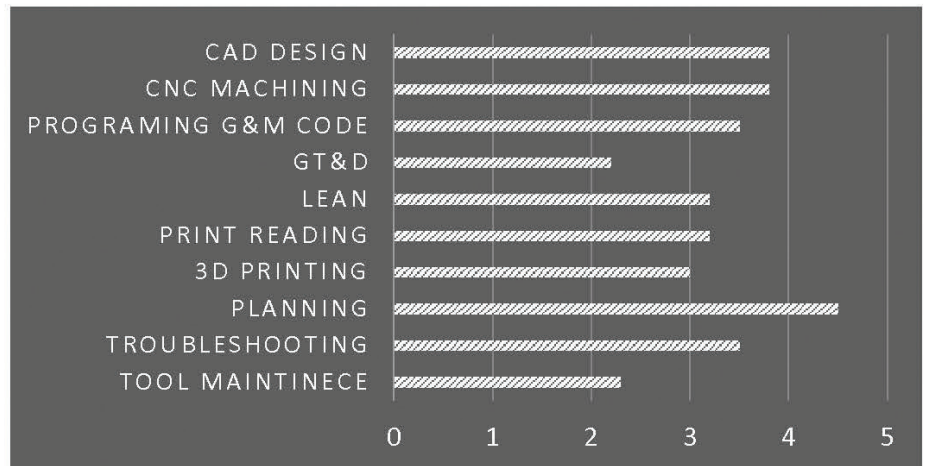
- Fishing is my favorite thing to do in my free time whether fly or casting; but I prefer fly fishing.
- Hiking is another of my favorite past times. Picking a direction and walking without a destination is a very calming experience.

## SKILL CHART:

Most Interested

Level of interest >>>

Least Interested



Level of ability >>>

Intro Student Experienced Student Advanced Student Entry Level Professional Experienced Professional

## SKILL HIGHLIGHTS

### CAD Modeling

CAD Modeling has always been one of my strongest skills. I always try my best to model and design parts that are both useful and have an artistic appeal.

### Machining

Machining is another skill that I pride myself in. Machining allows me to take my CAD models and turn them into a physical part.

## Lighter

### Tools and Materials:

For this project I used aluminum and rubber O-rings to make a lighter for my collection and for camping

### Skills Used:

In order to complete this project I was required to create a CAD model and create 4 different toolpath programs to Machine the finished product

### Challenges:

One of the biggest problems I faced was work holding and positioning. In order to overcome this, in my first 4<sup>th</sup> axis program I machined flat tabs that could be placed in the jaws of a vice that would secure my part and position it perfectly.

### Outcome:

The outcome of this project was everything I hoped it would be. An air tight lighter with that prevents evaporation of lighter fluid, so its perfect for camping. After many hours of designing, setups, machining and troubleshooting I produced a part that I am proud of.



## PROJECT HIGHLIGHTS

### Tools and Materials:

To get my welding certification I used 7018 rod and 3/8 plate for my test material.

### Skills Used:

To get my certification, most importantly I had to have skills in welding. I also had to learn how to clean welding.

### Challenges:

The biggest challenge was learning how to weld consistently and keeping my skills. I also had to learn how to thoroughly clean my welds to make sure there were no inclusions that would fail my test.

### Outcome:

Overall the outcome of this project was a successful AWS vertical and overhead welding certification.

## Welding Certification





# MACHINING



**Cameron  
Nix**

**Machinist**

-Machining student

**Residence:** Butte, MT

**Target Work Location:** Montana Or Washington

**Montana Tech  
Highlands College**

**Graduating in 2025**

**MY NEXT 3 YEARS:**

Studying machining and moving into industry to further my skills.

**MY LONG TERM GOAL:**

I want to become a well rounded employee and a good trustworthy machinist.

**ASK ME ABOUT:**

- My self-made tools
- My CNC Skills
- Snowboarding
- Montana

**SKILL CHART:**

*Interested*

*Level of Interest >>>*

*Most Interested*



**SKILL HIGHLIGHTS**

**Precision Measuring**

I use Precision Measuring often in class when we need to make parts to a specification with tight tolerance. I plan to get more consistent in the future with it so that I can get to more precise parts and more accurate measurements.

**Teamwork**

In my classes we have worked on partnered projects to improve communication with others in a workplace and demonstrate the importance of well explained directions. This has been an integral part in preparing to join the workforce and becoming a team player for future projects.

**Partner Project**

**Tools and Materials:**

End Mills, Face Mill, Aluminum

**Skills Used:**

Teamwork, coding, Machine running

**Challenges:**

We had to make a set up sheet that was detailed enough for a partner to be able to run the program without talking to each other.

**Outcome:**

We each cut an aluminum coaster from the other's code and had to trust that the info on the sheet matched what we needed for the code in the machine.



**PROJECT HIGHLIGHTS**

**Micrometer Stand**

**Tools and Materials:**

End Mills, 2" Face Mill, Drills, Taps, Delrin, Aluminum

**Skills Used:**

Precision measuring, Machining, Planning

**Challenges:**

We took an unconditioned block of aluminum and made it square before cutting down to size. There were angled slots that had to be lined up and drilled down to a depth that needed to be calculated from the dimensions on the blueprint.

**Outcome:**

A solid adjustable stand for a micrometer to sit on a table or workbench.





# MACHINING



## Andrew Pravecsek

## Welding/Machining

Recent graduate planning to get military training in Aviation Maintenance

**Residence:** Helena, Montana

**Target Work Location:** Anywhere that holds adventure

**Capital High School**

**Graduated in 2024**

### MY NEXT 3 YEARS:

I plan on enlisting in the United States Coast Guard to serve as an aviation mechanic for 4-6 years

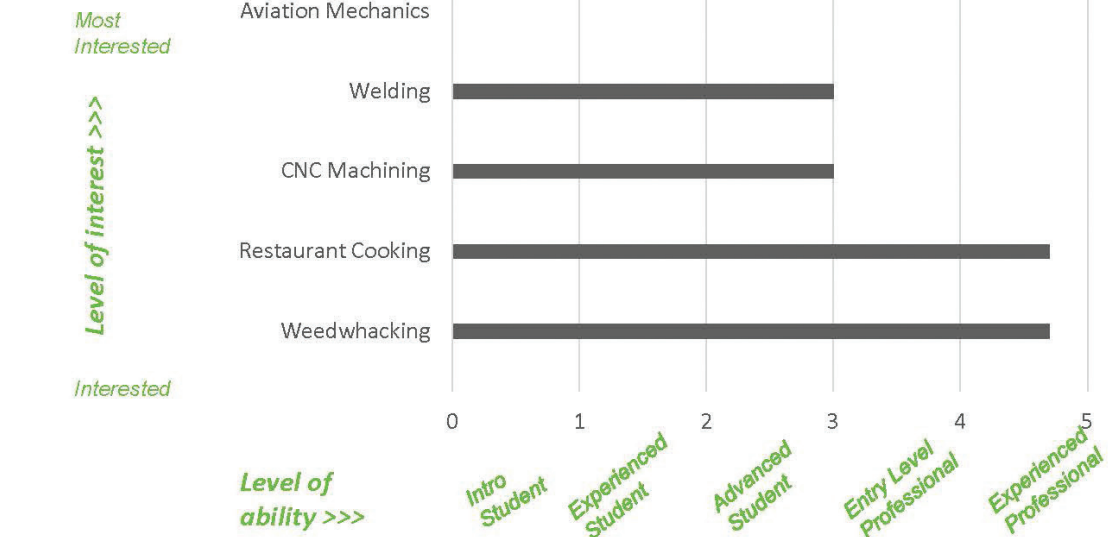
### MY LONG TERM GOAL:

After serving in the Coast Guard I plan to attend college and major in mechanical engineering. After that I will start applying for the space program

### ASK ME ABOUT:

- Working for the Montana State Legislature
- Machining parts for NASA
- Becoming a certified welder and machinist in high school

### SKILL CHART:



### SKILL HIGHLIGHTS

#### Learning

I am interested in most things and can learn anything I put my mind to.

#### Problem Solving

I am good at problem solving and troubleshooting, and having patience while doing so.

### Damascus Knife

#### Tools and Materials:

A 3 pound hammer, propane forge, anvil, angle grinder, tongs, pliers, high carbon and mild steel and sandpaper.

#### Skills Used:

Hand-eye coordination, welding, forge welding, angle grinding, and endurance.

#### Challenges:

I realized midway that I did not have enough metal to finish the knife, so I cleaned up the billet, found more metal, and forge welded it on.

#### Outcome:

An awesome Damascus knife with a twisted guard and stacked leather handle, and a lot of forging knowledge.



### PROJECT HIGHLIGHTS

### NASA Actuator

#### Tools and Materials:

1/2 inch flat endmill, 1/8 inch flat endmill, 1/16 flat endmill, 4-40 spiral flute tap, dial caliper, MasterCam, and aluminum.

#### Skills Used:

Blueprint reading, understanding of tolerances, machining knowledge, and problem solving.

#### Challenges:

The only information I had to start this project was the blueprint. I had to read it, make new programs, jigs and sequences to machine it, and troubleshoot along the way.

#### Outcome:

Six accurate programs to machine a part for NASA, and one in tolerance actuator.



# MACHINING



## Augustus (Gus) Swant

**Welding**

I was named after Lonesome Dove

**Residence:** Helena, MT

**Target Work Location:** Welding and machining fab

**Capital High School**

**Graduated in 2024**

### MY NEXT 3 YEARS:

I plan to graduate from CWI trade school for welding; and plan to be working and traveling.

### MY LONG TERM GOAL:

I plan to have my own house in Alaska.

### ASK ME ABOUT:

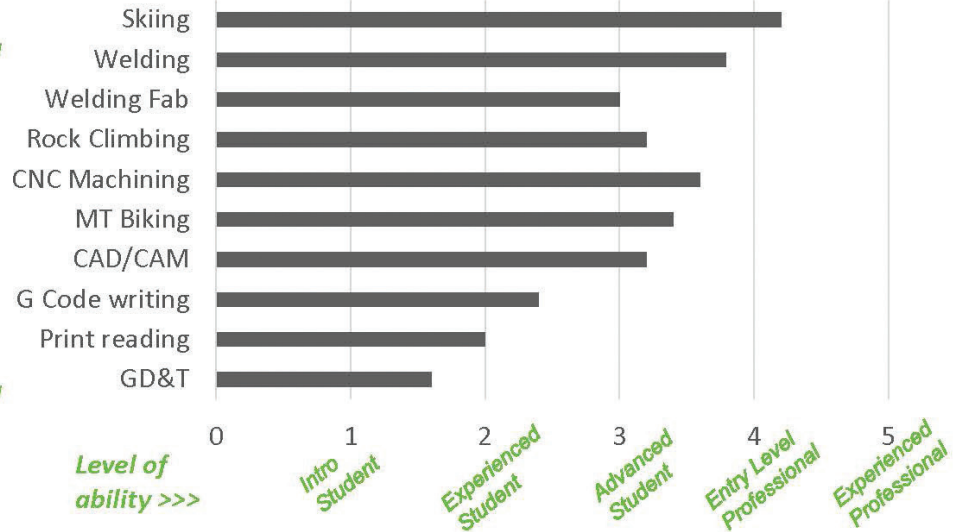
- Skiing and Rock Climbing are my two favorite activities in the world and I am always willing to talk about them.
- Fly Fishing
- Mountain Biking
- Hunting

### SKILL CHART:

*Most Interested*

*Level of interest >>>*

*Interested*



### SKILL HIGHLIGHTS

#### Skiing/Rock climbing

I have been Skiing since 3<sup>rd</sup> grade and Freestyle Skiing since 6<sup>th</sup> grade. I have won a few ski competitions when I was a freshmen in high school. I have also won four different rock-climbing competitions all over the state.

#### Welding

The first time I welded was when I was 8 and I fell in love with what I was doing. In high school, I took all the advanced welding classes I could. I have one certification and am working on more. I will be attending trade school for welding in the fall of 2024.

### Fly Fishing Net

#### Tools and Materials:

For this project I used a lot of clamps and different kinds of glues and epoxy. For materials I used oak wood and dark Peruvian wood.

#### Skills Used:

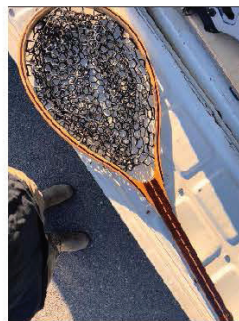
All of the skills I learned from research and classes. One of the skills was steaming the wood and bending it.

#### Challenges:

Trying to keep the wood from cracking when I bent the wood; another one was trying to keep it all uniform.

#### Outcome:

The outcome of this project was amazing the grain in the wood really popped after the finishing coats and it is super strong.



### PROJECT HIGHLIGHTS

### Truck Bed Camper

#### Tools and Materials:

Power drills and power saws for tools. I used 1 inch square tubing and a variety of different kinds of wood

#### Skills Used:

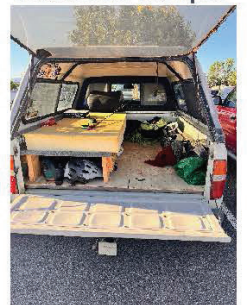
Carpentry skills and measuring skills

#### Challenges:

Getting the bed frame holes in the floor and making it fit

#### Outcome:

The outcome is great, the bed is very stable and it is very comfy to stay in.





# MACHINING



## Zach Teplitzky

Graduated CNC machining student

**Most Recent School**  
Gallatin College

## Machining

**Residence:** Bozeman, MT

**Target Work Location:** Bozeman, Colorado, Salt lake

**Graduated / Graduating in 2024**

### MY NEXT 3 YEARS:

Get a job in machining and I would like to progress into something more on the engineering side. Possibly do some traveling.

### MY LONG TERM GOAL:

I would like to have a place to live and some land. Possibly go back to school

### ASK ME ABOUT:

- My time working at Thinklabs
- Machining projects
- My cars
- Biking or Skiing

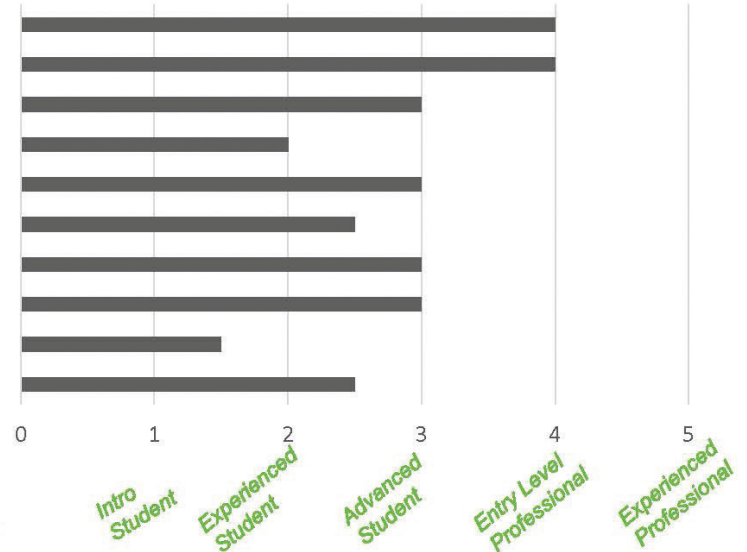
### SKILL CHART:

*Most Interested*

*Level of interest >>>*

*Interested*

Mountainbiking  
Snowboarding  
Working on cars  
Motorsports  
CNC Lathe  
Manual Lathe  
CNC Mill  
Fusion 360 CAM  
G and M code  
Solid works CAD



### SKILL HIGHLIGHTS

#### Fusion CAM

I used it for all of my projects while in school. The programming is nice and fairly simple to use, makes for good parts.

#### Cars

Working on cars. I like working on cars because I like to personalize my things so they can be unique and different.

### Chess Set

#### Tools and Materials:

6061 aluminum, right and left handed cutting tools, part off and groove tools.

#### Skills Used:

CAD, CAM, CNC lathe, 4<sup>th</sup> axis

#### Challenges:

For the bigger pieces chatter was a challenge. For some of the pieces like the queen getting the tight radii. Having never machined before I had to learn all the tools and different way to use the machine for each piece.

#### Outcome:

Finished with an awesome made chess set.



### PROJECT HIGHLIGHTS

### Pistachio

#### Tools and Materials:

Wrenches, ratchets, picks, Steering heel tools

#### Skills Used:

Righty tighty lefty loosey

Discipline, some repairs on this

Thing are very frustrating.

#### Challenges:

The awful smell and horrible condition of the cab. Also there was no key. It had been sitting on this old dudes property for years and I towed it away got it running and now use the truck all the time.

#### Outcome:

I now have a cool truck.













