

NUTS, BOLTS & THINGAMAJIGS[®]

The Foundation of the Fabricators & Manufacturers Association, Intl.



SUMMER MANUFACTURING CAMP[®]

PLAYBOOK

NUTS, BOLTS & THINGAMAJIGS®
The Foundation of the Fabricators & Manufacturers Association, Intl.

MISSION

To engage, nurture, and excite individuals of all ages in the pursuit of careers in manufacturing.



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GETTING STARTED



Engaging the manufacturing community in your camps

Nuts, Bolts & Thingamajigs® (NBT) camps are held at community or technical colleges and high schools with manufacturing technology programs. Typically, the faculty members serve as instructors. A summer camp aimed at introducing students, ages 12-16, to the exciting world of manufacturing through hands-on discovery will encourage more of them to pursue a manufacturing career and gain the necessary technical skills through the host school's programs. Many school's administrators comment that the camps serve to attract future students to their manufacturing programs. But camps can't achieve their long-term goals in isolation from their area's manufacturing businesses. Ultimately, the beneficiaries of a summer manufacturing camp program are the business owners and companies in that

local community. **Manufacturing camps are inspiring their future workforce!**

Consider which manufacturers in your area are large employers, have a positive impact on the local economy, and are well-known for supporting community organizations. Consult individuals on your school's advisory boards and manufacturing program committees for recommendations and ideas.

When applying for a camp grant, a school should propose at least two community partners and/or local manufacturers who will agree to provide a plant tour or send a guest speaker or mentor to your camp. The tours and speakers should serve to expose students to the local manufacturing industry and highlight career opportunities. Other things that local businesses have

provided to NBT camps are:

- Materials needed for projects built in camps
- Bus rental costs for students traveling to a plant tour
- Lunch for students on plant tour days
- Funds for project supplies and tools
- Shop time for hands-on projects

Approaching the local companies with your request for assistance may seem a bit daunting. But these business people know that having a strong, motivated pipeline of potential employees is critical to keeping their businesses vibrant and growing. Getting them to help with your camp project may be easier than you think.

APPLYING FOR YOUR FIRST CAMP GRANT



How to create a winning grant application

Visit nbtfoundation.org/host-a-camp

First: Determine Eligibility

- Schools must have a degree program or curriculum leading to a career in manufacturing and can offer coursework focused on business entrepreneurship.

Next: Review the NBT Camp Host Handbook and the Grant Awards & Requirements flyer before you start your application

We highly recommend that the people who will be involved in administering, promoting, and teaching the camp meet in advance of filling out the online application to share ideas and plans. They should all have an opportunity to review the Camp Host Handbook and the Grant Awards & Requirements flyer.

- Schools must propose at least two community partners and/or local manufacturers to provide tours and/or guest speakers that can expose students to the local manufacturing industry and career opportunities.
- Schools must be able to accommodate a minimum of 12 participants per camp. Consider computer classroom size as well as shop lab space availability.
- Schools must be able to provide a hands-on manufacturing project experience that covers design and build at least one project that each student can make and take home at the end of camp.
- Camp hours: minimum of 25 hours for a one-week camp and 45 hours for a two-week camp.

- NBT recommends that camps charge participants a minimum fee of \$59 for a one-week camp or \$99 for a two-week camp.
- Exceptions or variations from any of the listed requirements should be explained in your application.

Next: Preview the camp application

While the application needs to be submitted online, you can print a copy and make sure you have answers to all the questions before you begin the online process.

Finally: Submit a completed application online July 1-December 1 for the next summer.

ACHIEVING SUCCESS WITH YOUR CAMP



Important considerations

Be sure to give close attention to this list of important considerations to ensure your camp is successful for your school, your camp participants, and your community and manufacturing supporters:

- A. Promotion and marketing
- B. Coordination with NBT
- C. Tuition and camp scholarships
- D. Guest speakers and instructors
- E. Hands-on engagement
- F. Impress the families
- G. Demographics
- H. Local business support

A. Promotion and marketing

- Many colleges have their [summer program catalog](#) in print by the end of January. If that is the case at your college, don't miss your biggest (free) promotional opportunity — be sure to get your camp information to the on-campus office that produces the catalog in time. Be prepared by having your camp name, dates, and contact/registration information available when you are filling out your grant application or shortly thereafter.
- [NBT provides you with custom-designed materials](#) you can use to promote your camp to local schools or youth organizations. Think about the schools or other community programs where you may want to provide flyers or posters about your manufacturing camp.
- [Engage your college's PR department](#) to write and distribute news releases on your camp. Use the angle of the skilled labor crisis in manufacturing and how this camp will help to overcome the issue in your community. Plus, share all the great photo opportunities that the social media and PR team will have once the camp is underway. Guaranteed success with the media!
- [Make sure that your community partners](#) can and are encouraged to promote the camp to their employees. Give them some of your custom posters and flyers. Think about employees' kids and grandkids who may be prime candidates for your camp.

ACHIEVING SUCCESS WITH YOUR CAMP



B. Coordination with NBT

We really want to help you host a great camp and will do our best to get you the information and materials you need on a timely basis. Please meet our requested deadlines before, during, and after your camp. Contact NBT Staff with any questions at 888-394-4362 or foundation@fmanet.org.

C. Tuition and camp scholarships

Often, camp directors state that they can't charge a tuition because they serve a population that would be priced out of the program if they did. Other times, the recommended NBT tuition of \$59/week is not equivalent to prices for similar programs focused on the same potential audience.

Asking for a financial commitment from a family is one way to show that the program has value and once parents have made a financial commitment, they are more likely to make sure that their student participates.

If your school serves an underprivileged district where families may not be able to afford the tuition, a good solution is to offer camp scholarships. You can set some type of requirement or application for earning a scholarship. It may relate to having a teacher from their school recommend them, or it may be that the student submits an essay explaining why they want to attend. We have seen scholarship programs take many forms, but the important thing is that parents and students see the program as a valuable use of their time and effort.

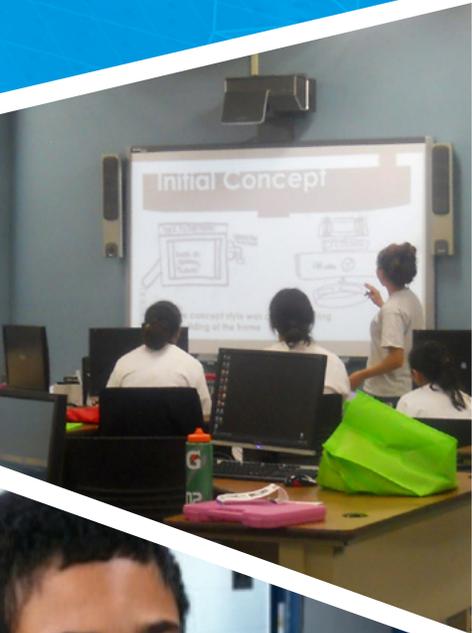
Some colleges offer a wealth of summer programs for kids and have established one standard price for all programs so that camp participants don't make their registration decision solely because of price. If all one-week camps at your school charge \$35 tuition, your manufacturing camp also needs to charge \$35, simply state that in your application. We have seen successful camps that have charged as little as \$25 and as much as \$395 for a one-week camp. It has everything to do with what works best in your community.

D. Guest speakers and instructors

Look for companies that offer variety in the products they make, the technologies they feature, and the career paths they offer. It's good to have enough potential partners available so that you can weather any possible last-minute cancellations and rotate your tours and presenters over the years.

One other important consideration is to seek variety in the people who interact with your campers, whether they are presenters or tour guides. Make sure they see both men and women working in manufacturing, including minorities, and as much as possible see folks from different age groups. It's fabulous when they can interact with people who are young — both in years and in their careers — and passionate about manufacturing.

ACHIEVING SUCCESS WITH YOUR CAMP



E. Hands-on engagement

Tours of manufacturing companies are terrific; in fact, they are the lifeblood of the NBT camp program. Making it possible for kids to get hands-on learning experience is very important and we recommend that you find ways to increase this touch-and-feel aspect of their encounters at manufacturing companies. Can your tour guide arrange for a table of samples that will make it possible for the kids to hold products or sample models in their hands? Please ask your tour guide to give the kids a chance to get up-close-and-personal with the company's products. That's a memory they will never forget and will share with family and friends.

When you are planning your camp's design and manufacture project, make sure that it is something each student can take home. We've seen some great camps where the students make a team project, which is a great experience for teaching

team work and it's also important that every camper go home with one item they've made themselves. The hands-on nature of these camps is what sets them apart from a regular day in school and can provide inspiration to a child that doesn't necessarily excel in a typical classroom setting.

F. Impress the families

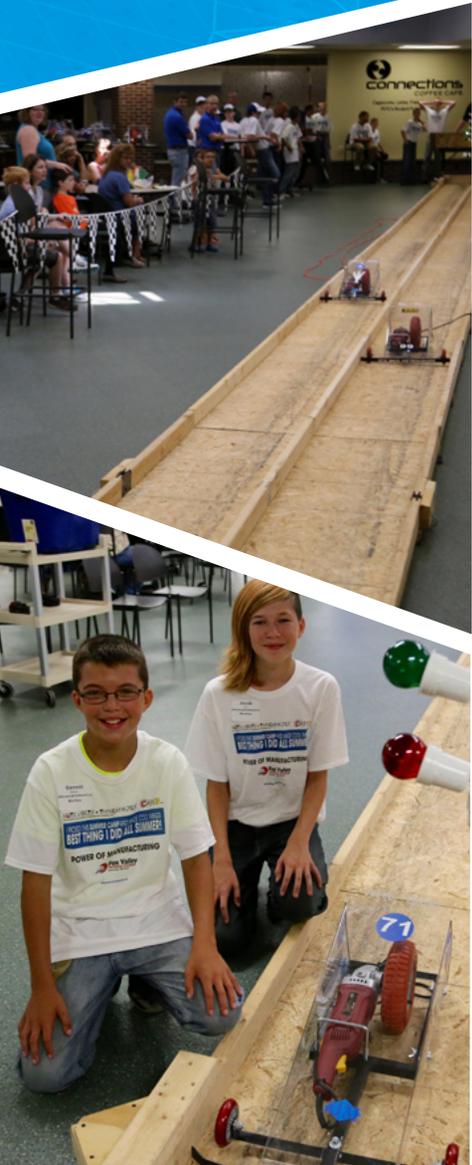
Camp graduation events are becoming more and more common. Camp directors have recognized that creating events on the final day of camp, to which parents and other family members are invited, are crucial to the camp's success. They allow family members to share in the experience the child has had. In most cases the kids are involved in presenting or competing, and parents are amazed to see how much their child has learned and accomplished in a week or two. Frequently, parents go home and talk up the experiences to their

friends and other parents, guaranteeing an increase in enrollment for the next year's camp! See the following examples.

At the GADgET Camp (Girls Adventuring in Design, Engineering, and Technology), held each year at **Triton College**, the girls create and prototype a product. On graduation day, they demonstrate their finished products with a PowerPoint presentation for the entire audience outlining the reason for the product, the challenges they faced in designing it, and how they overcame those challenges.

SECTION 3

ACHIEVING SUCCESS WITH YOUR CAMP



At the **Power of Manufacturing Camp**, held each year at **Fox Valley Technical College**, the students design and build power tool race cars. On graduation day they hold a drag race competition and family members and representatives from local sponsoring companies are invited. The audience gets to witness just how adept the students have become at solving the kinds of technical problems that can occur in a high-pressure race environment

At the **Peninsula K-Next! Camp**, held each year at **Thomas Nelson Community College**, the students are divided into teams which they form into manufacturing companies. Each company is given the

same production challenge. On graduation day the companies compete to fulfill the production challenge in a timed race. The teams are mentored by local manufacturers and the competition is judged by representatives from local industry. All this happens in front of a viewing audience of friends and family members. The winning company members are presented with great prizes provided by local sponsors.

If your camp doesn't lend itself to a final graduation or celebration event, there are still ways to make sure that parents know what's happened in camp each day. A former NBT camp director, now retired, sent a daily email to the parents of his campers

CAMP DIRECTOR PLAYBOOK

featuring a highlight of the day. He also sent a similar email to his local sponsors and supporters:

"This simple activity, which took me just 15 minutes at the end of each day, enabled families and sponsors to feel included in the camp's success and resulted in strong support and advocacy for future camps."

—John Calver, (ret.) Director of Manufacturing Summer Camps, Thomas Nelson Community College

ACHIEVING SUCCESS WITH YOUR CAMP



G. Demographics

It's tempting to want to open your camp to every possible student who might want to attend. However, an age gap of just a few years can make a big difference in your camp participants' perspective and attitude. We used to see camps that advertised they were open to kids 12-18. Today it is more common to have a narrower age range — often not more than two years. The students in the camps need to work together and they have just a few days to form bonds that will make their activities successful. Carefully selecting your demographic groupings is important.

Another demographic to consider is gender. For example, female students may be more interested and feel comfortable signing up for a camp that is exclusive to girls only. Several girls only camps have had tremendous success.

GADgET Camp Founder Explains Girls-focused Camp Concept

The GADgET camp concept allows girls who show interest and aptitude in science and math to explore the possibilities of real-life problem-solving through the design and manufacturing process. The environment we've created is both nurturing and challenging at the same time due to the all-female environment. It's rewarding to see how valuable the experience has been not just for the campers, but for the older girls who serve as mentors and assistants. At every level this experience has value for the participants.

—Antigone Sharris, Chair, Engineering Technology, Triton College, and NBT GADgET camp Director, 2011-present

H. Finding Enough Local Business Support

This item is extremely important. Camps should strive to become part of the fabric of the local manufacturing business community. The NBT grant program has always been predicated on this concept. NBT provides three years of funding in lower denominations each year while the school grows support from the local business community, so that at the end of three years the camp can be locally self-sustaining.

ACHIEVING SUCCESS WITH YOUR CAMP



While it is important to start your camp application process with a couple of companies that will support you in year one, it is equally important to grow your support group each year. Ideally, the camp should be recognized as the best way to introduce manufacturers to their future workforce and inspire youth to stay in the community. Students get their career training at your college or trade school, and pursue employment at a local company.

Your first camp will likely spawn ideas for other camps and you may apply for additional camp grants for new and unique concepts, which will allow the three-year funding cycle to start again. However, to do that you need to be able to respond to the unique needs of your area employers.

Let's look at a hypothetical business community: Perhaps your first camp focuses on careers in your community related to the companies that serve the aerospace industry. After a couple of years, you may want to start a camp that focuses

on careers in your community's medical manufacturing companies. And after that, perhaps you focus another new camp on the solar power industry.

With each of these approaches you will build relationships with new community partners and your school will become their way to inspire a new generation of workers. Campers who loved one camp will likely also register for a follow-up camp or encourage a sibling or friend to participate.

If you go back to the beginning of this guide you will see that the first thing mentioned is that the ultimate beneficiaries of a summer manufacturing camp program are the area's manufacturing employers. With that thought in mind, it should be easier for you to share that benefit with a growing number of members in the business community and earn their support for your camps.

In addition to the individual employers, you may want to seek support from your area's Chamber of Commerce and especially the

local economic development organization. Their role is to support businesses in the community and bring more businesses to the community. You are providing them with a unique and fun way to do both.

Remember these facts when asserting that manufacturing is critically important to your community and the country:

- Manufacturing supports more than 18 million U.S. jobs.¹
- Manufacturing comprises 12% of the U.S. GDP.²
- Manufacturing offers diverse career opportunities from management and accounting to engineering, design, safety, and myriad types of equipment operation.
- Manufacturing careers pay better than other career sectors (avg. of \$77,000 vs. \$60,000).³

¹ The Skills Gap in Manufacturing, 2015 and Beyond, Deloitte and The Manufacturing Institute

² Economic Policy Institute, The Manufacturing Footprint and the Importance of U.S. Manufacturing Jobs

³ National Association of Manufacturers, <https://www.nam.org/Newsroom/Top-20-Facts-About-Manufacturing/>

POST-CAMP FOLLOW UP



Important post-camp activities

What you do after your camp ends is just as important as what you do to prepare for camp.

The important post-camp activities include:

- A. Thank you communications
- B. Submission of final reports and photos to NBT
- C. Completion of your NBT camp grant application for next year

A. Thank Everyone!

- Send a thank you email to all the parents of your campers. Be sure to include a photo from the camp showing all the participants. If you have a photo gallery from the camp on Facebook or another social media platform, make sure to include a link so they can find it and share it with their friends. It's a great way to recruit students for next year!
- Call and/or email every one of your local

business community supporters to thank them for their support of the program. Include a photo from the camp with an email.

- If you can, create a thank you card big enough for every camper to sign it and mail it to each of the companies that opened their doors for plant tours.
- Send a thank you email to everyone who helped from your school — from the registrar to the PR department, instructors to bus drivers.

B. Submit Post-Camp Paperwork to NBT

NBT camp grants are provided in two payments. The first payment is mailed to you as soon as you sign the acceptance for the grant so that you have it well in advance. The final payment is mailed to you when NBT receives your post-camp paperwork, which consists of a final evaluation survey and a financial report.

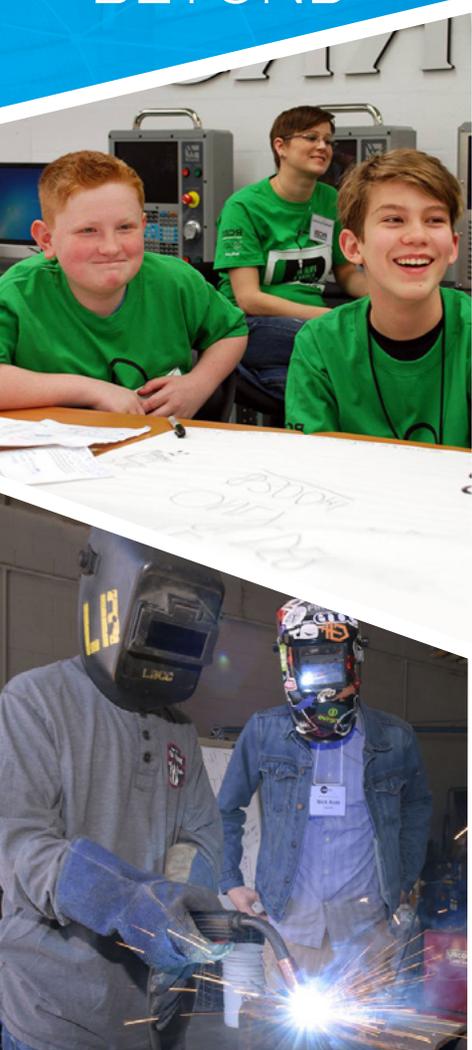
NBT needs to receive this within 30 days of the close of your camp to send your final grant payment.

In addition, NBT would appreciate receiving photos from your camp that can be used on the NBT website, in our donor newsletters, in magazine articles about camps, and on NBT social media platforms.

C. Apply for Next Year's Camp Grant

Once camp is over, everyone involved will be filled with great ideas about what they would do (the same or differently) if they were to do the camp again. Take advantage of this enthusiasm and creative thinking to complete your camp application for next year. You can organize a debriefing session with everyone involved, capture those great thoughts, and have your application done in no time at all! Camp grant application period is July 1-December 1.

SUSTAINING A CAMP THROUGH THE GRANT CYCLE AND BEYOND



Grant cycle

The NBT grant program is designed to support a camp for up to three years on a reducing grant schedule (\$2,500, \$1,500, \$1,000). By the time you reach the third year, you should have enough local support to make it possible to continue to run a camp that is sustained completely with

local support. By year four, your camp can join the ranks of NBT Affiliate Camps, which means NBT will continue to provide you with marketing support and classroom materials, as well as custom t-shirts for your campers.

By this fourth year (and often sooner), camp locations have often created new camp concepts and reapplied for grants so that at any given time they may be running two or three camp cycles each summer, all of them with a different focus.

Legacy camp commitment

Occasionally at NBT we will get this inquiry: “How can we make sure there is a camp like this in our community every year?” Sometimes this question comes from a college that has hosted a camp. Sometimes it comes from a manufacturer or other business entity in the community that has supported a camp for a few years. NBT is prepared to help make this happen.

As a charitable foundation, NBT can set up endowment accounts that are designed to manage a tax-deductible donation and pay out an annual amount in the form of a camp grant based on the interest earned by the donated principle. Specific guidelines can be formalized on the use of the funds. This is a common practice in the world of scholarships and can easily be adapted for camp grants.

If you believe that this potential exists in your business community, start a discussion with NBT’s grants manager and we can explore this option together. We’ll even approach a potential donor on your behalf and explain how this may work. Call 888-394-4362 and ask for our help!

APPENDIX A : Project Ideas, Plans, and Blueprints

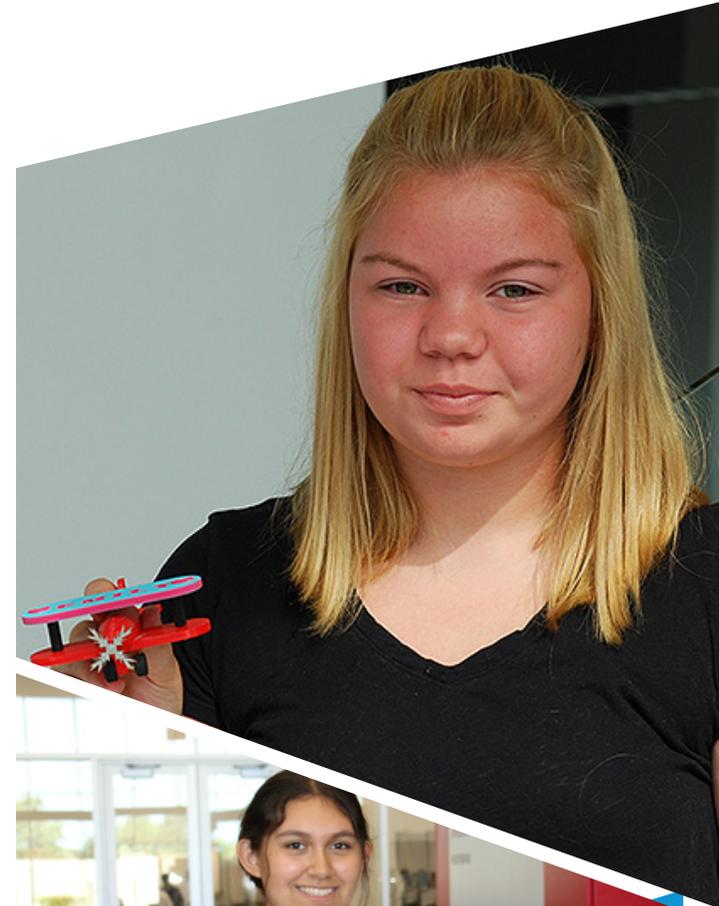
These are just some of the projects that have been made at NBT summer manufacturing camps.

- Electric guitar
- Key chains
- Dice
- Chess pieces
- Soda can airplane
- Rube Goldberg project
- Robots of all kinds and functions
- CD/DVD holders
- Ball drop game
- Picture frames
- Jet toys
- Steel can rovers
- Electronic device holder (cell phone, iPod)
- Single-hole paper punch
- Grill
- Candle holders
- Metal flowers
- Storage boxes
- Star
- Plant holder
- Radio controlled car
- Lawn ornament
- Aluminum accent lamp
- Dog tags for use as jewelry, luggage, or pet ID tags
- Hover craft
- Machined game
- Brass ink pen
- Dominoes
- Tool box
- Bottle opener
- Table lamp
- Children's swing
- Functional metal art objects
- Tools such as pliers and hammers
- Tables (wrought iron and laser cut)
- Horseshoe coat hook
- Trivet/hot plate
- Mailbox
- Metal desk organizer
- Rings and other jewelry
- Aluminum engraved desk plate
- Lamps of all sizes and from all kinds of materials
- Welded artwork
- Bird houses
- Thermoformed plastic projects: bottles, cup holders
- Power tool dragsters
- Model-size motorcycles
- Wind turbines
- Clocks
- Functional metal art for placement in the community (parks or on campus)

APPENDIX A

Another Great Resource for Project Inspiration

While most NBT camps go way beyond the projects that can be found at [MakerSpaces.com](https://www.makerspaces.com) and use more sophisticated equipment and materials, we've found that the kinds of projects available at this website can be great kick-off projects and provide simple ways to demonstrate a specific principle (like hydraulics, for example) before delving into a bigger project. Check out the free projects for younger campers at: <https://www.makerspaces.com/25-makerspace-projects-for-kids/>



Camp Project: Fun With littleBits and Physics

From an NBT Camp Director at Manchester Community College in Manchester, N.H. and a Manufacturing Editor

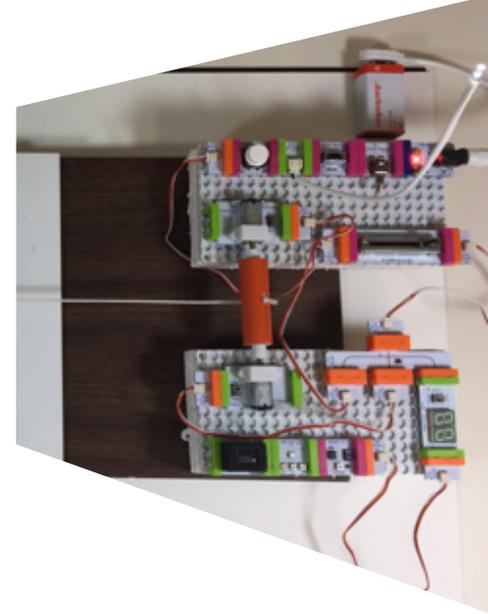
This team project uses a number of littleBits modules to control two DC motors set up in a winch configuration. The winch pulls a "sled" (a plastic draw from shop storage draw set). The students can add weights (some big washers) and observe the effect on the speed of the sled. The wooden base is a 24" x 8" shelf from a bookcase in my office. The white plastic material has

rubber on the back and was made from some material I had purchased many years ago to make mouse pads. I drew lines, spaced one inch apart, on the plastic and numbered them 1-10.

The goal with this project was to introduce the students to some basic electrical, mechanical, and energy concepts. There are supporting documents contained here for others to use. To better understand the rest of this presentation, you may want to download and print out the Circuit Diagram. The purple text identifies the littleBits modules by their official product numbers in the littleBits online store. All littleBits have three conductor plugs to connect

them together. For Positive, Negative, and Control, it's best to refer to the littleBits website page for a more detailed explanation of how the bits work and connect to each other.

Everything runs off of a 12-volt battery. Since littleBits themselves operate on 5VDC, the students learned that the power bit also incorporates a voltage convertor / regulator to reduce the voltage to 5 volts.



APPENDIX A

Then, I added a series of single-pole switches and explained that since all the switches are in series they all have to be “ON” for the first “flex LED” to light. Then, by pressing the pushbutton the power is transferred to a slide (variable) resistor. With the slider set to zero resistance, the full voltage of 5 volts is sent to a 3-way circuit fork (splitter). Two of the branches are connected directly to the two DC motor modules. For the winch to work correctly, one motor must run clockwise while the other runs counter clockwise. Each of the motor “bits” include a small reversing switch and we talked about how DC motors can be reversed by reversing the polarity to the motor. The third branch of the circuit fork is connected to an LCD seven-segment digital display set to display the voltage. With the

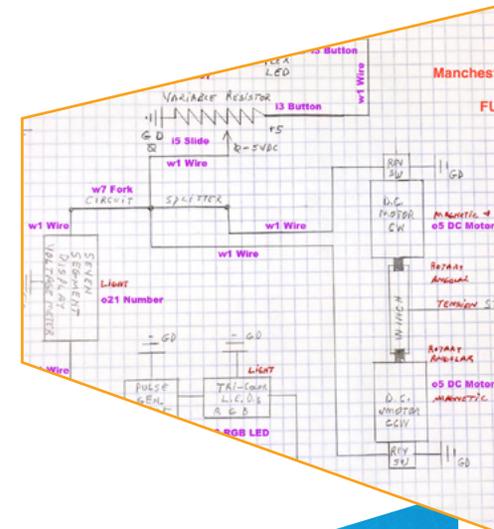
variable resistor set at 0 ohms, the voltage was 5 VDC.

Of course, along the way we talked about voltage and current and a bit about how LEDs work. From the seven-segment display, the circuit continues to a pulse generator bit that powers an RGB LED and a buzzer. This is where we covered machine safety. When you press the pushbutton the motors run, the winch turns, the sled moves, and the RGB LED flashes orange while the buzzer sounds intermittently. We talked about how engineers always must think of safety first in all their designs.

Then, we generally discussed the factors involved with friction. Those being the vertical downward force of the sled, the type of surfaces that are sliding on each other (coefficient of friction), and the surface area.

Finally, we talked about the conservation of energy. How the chemical energy in the battery is converted to electrical energy and then all the places where that energy was used up in the form of light, sound, and heat. We spoke about things in generalities and as I introduced each general topic, I asked the students for examples they could think of from their experiences. There were plenty of good STEM ideas discussed in their own terms.

This concluded the first half hour of the project presentation. I had prepared two project setups, so we broke into two groups of students and they were told they could just experiment on their own and have FUN!



APPENDIX A

What happened next was quite amazing ... I purposely didn't mention to the students anything about the 10 lines on the white plastic sheet. One group decided to run some experiments. They used the stopwatch function on one of their phones to time how long it took the sled to move between lines, depending on the amount of weight they put in the sled. I told them observation is how folks like Newton and Marie Curie learned about physics. Meanwhile, the second group was doing something similar by varying the voltage to the motors while keeping the weight constant.

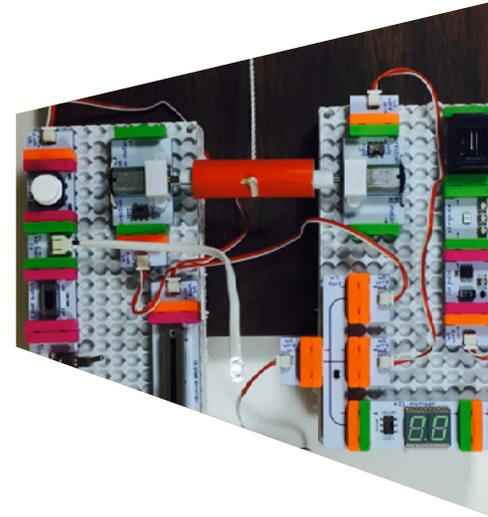
Then the most wonderful thing happened. When I returned to the first group they decided to see how the surface area would affect the speed of the cart. In all the times I have run this project with students and adults, I had never really figured out an easy method to accomplish this learning objective. The answer was **unbelievably simple!** The students just turned the cart (drawer) over so only the thin drawer sides were in contact with the plastic sheet! When I returned to the second group they discovered that by turning the plastic sheet over, so the cart was sliding on the rubbery side, that slowed things down to almost a stall of the motors.

"It must be that rubber has a higher coefficient of friction than plastic," one student exclaimed with a smile!

Frank and I hope you enjoyed this project and please feel free to use the resources we have provided in your own camp.

Dave DeWitt

The project¹ was provided by Camp Director Frank Xydias and Dave DeWitt, editor of manufacturingstories.com, who served as a community mentor for this camp.



¹ Based on use of littleBits <https://littlebits.com/education/>

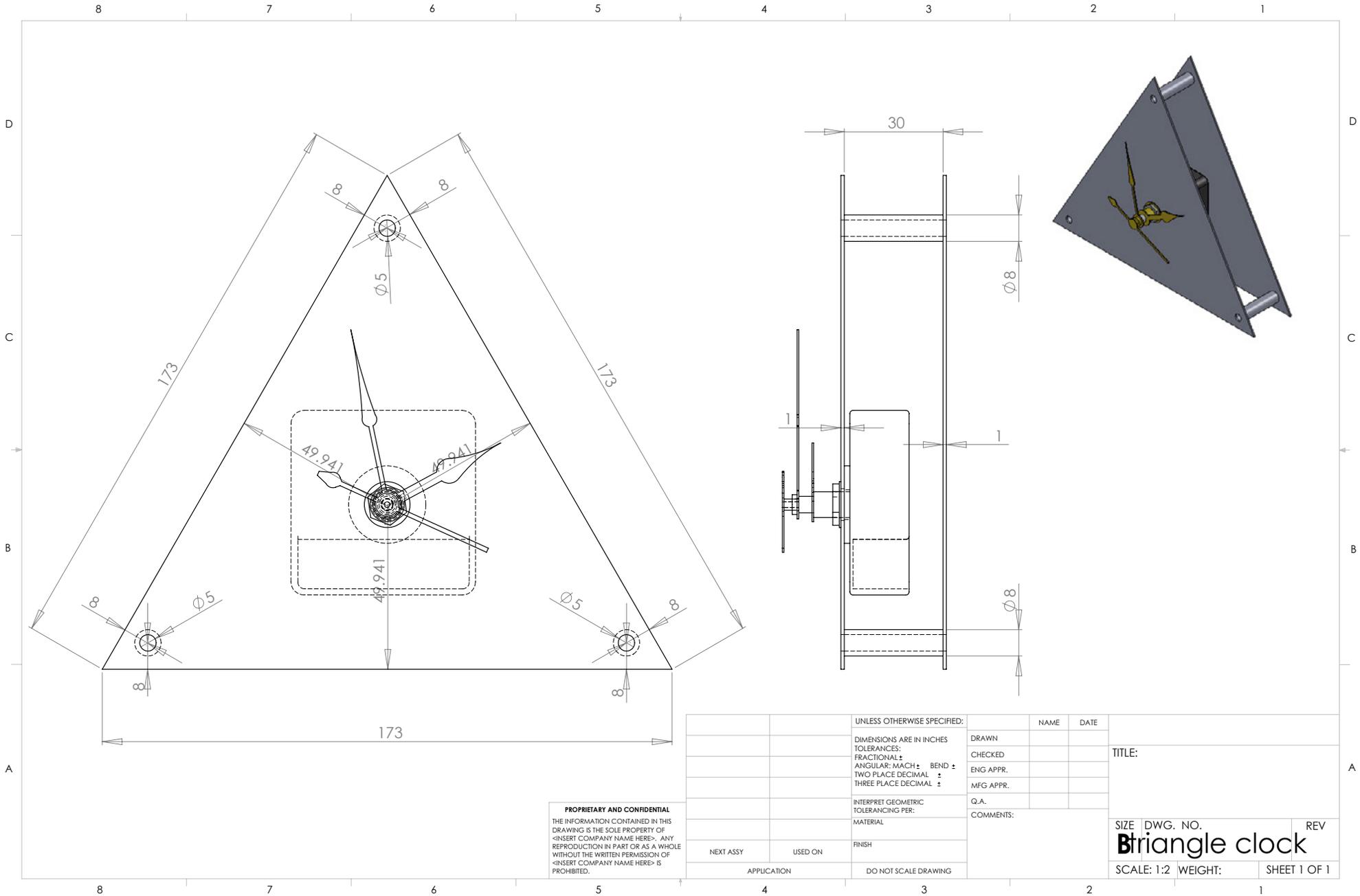
**Camp Project: Triangle Clock
From Peninsula K-Next! Camp
at Thomas Nelson Community
College in Hampton, Va.**

This project was designed at Thomas Nelson Community College to be part of a full production exercise. Students were divided into competing companies. Each company had to build a specified number of three different types of clocks under a strict time table, while being observed and judged by industry professionals. The triangular pieces of metal were pre-cut for them. The students assembled a tabletop CNC mill, which they used to engrave the numbers on the face of the clock. They deburred

edges, cleaned the metal, and painted their clocks using a small "paint booth", drilled a hole for the clock works, and then assembled the other components to reach completion. The print drawing for this clock follows this page and the clock assemblies are available for order through KlockIt at www.klockit.com.

Since the time of that original camp, this clock has been produced under different circumstances in different camp settings. The drawing is included here to serve as inspiration for those of you that may be seeking an idea for a clock project. Various types of clocks have proved to be very popular as NBT camp projects.





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10 Tips to Start a Successful Manufacturing Camp at Your School

By Mike Cattelino, Past NBT Chairman

Cutting through red tape in educational systems can be a monumental task. I found it to be an interesting challenge in achieving the initiatives that I have championed at Fox Valley Technical College. The people at the school are very passionate about what they do and usually have the best interest of the students in mind. Often, succeeding at an endeavor like this means relying on relationships you have already established. Contacts within the educational system can assist you in working through the processes that must be completed to get the intended results. Here are my suggestions for the top 10 ways to accomplish your goal:

1. Be passionate about your manufacturing camp idea.

You certainly had an idea that sparked your interest in getting a camp

program going in the first place. Stay close to the idea, keep your eyes on the goal, and continue to build the momentum. Excitement tends to build excitement.

2. Present data to support your goals.

Think about the “why” in what you are planning to build. Why is a camp important to your school and students? What outcomes do you expect? Do some research on the topic and when you find supporting data, document it. Be ready to present it to administrators and staff.

3. Reach out to your connections within the organization.

Your connections within the organization are your best supporters. It could be your colleagues, your boss, or a manager from another area. Have lunch with them or schedule an informal meeting. Share your concept and ask

for some feedback and advice. Be humble.

4. Trust your instincts.

To support the passionate part of this and keep the project on track, trust your instincts. If something feels right, move forward. If something seems to be going down an uncomfortable road, turn in another direction. Yes, this project could be something new, but everyone has instincts to guide them when they are not sure which path to take.

5. Engage industry partners early on.

Reach out to business and industry people that you know. Start locally, as they will have the closest connection to your school. In my case, I reached

out to my former employer first. Next, I reached out to our program advisory committee. This is a group of local employer representatives who we meet with annually to discuss the state of the academic program and solicit suggestions.



▲ **Mike Cattelino,**
Fox Valley Technical College, Appleton, Wis.
Former Camp Director
NBT Board of Directors, 2015-2020

6. Reach out to other educators for guidance and support.

See what other educators are doing, even if they work for “competing” schools. Post questions on social media and ask for input from educators. I started by calling a local high school technical education teacher when the concept of a summer camp came to my attention; I asked his opinion on what we could build, appropriate content for middle school students, and much more. We ended up developing and running the camp together for a few years. Creating a partnership like that was beneficial to the college and helped me gain support in a big way.

7. Be honest with everyone.

Do not try to sell the concept like a salesperson. Instead, treat it like an opportunity that you need some

help with. Help others understand that you are prepared to do the hard work — you just need their insight and expertise to create a great experience for the students. Keeping that “student focus” will also resonate with many at your school. If you are reaching out to other academic departments for assistance, let them know that the students attending the camp will have a chance to see their program area as well.

8. Plan ahead.

If you plan to run a manufacturing camp, have things in order by the end of summer in the prior year, or before. Have enough of the logistics worked out so that you can confirm the dates, the instructors and others associated with the camp, the schedule, plant tours, etc. Once the school year starts, people focus on the semesters in front of them and your plans will likely take a lower priority. The further out

you can plan the experience, the more comfortable people will be in helping with the project and sharing their expertise.

9. Plot out the details as much as possible.

Plan, plan, plan. Every detail will need to be sorted out if your camp is to run smoothly. A well-run camp will gain a lot of support for the future. Work out a daily schedule, perhaps using Microsoft Project or some other type of project planning software. It helps to keep things moving in the right direction. It also helps people understand your timeline and some of the urgencies that they may not have considered.

10. Address the WIIFM with each potential partner / supporter.

When it comes to projects like this that need a lot of people involved to make them successful, “What’s in it for me?” is the biggest unasked question. This goes back to my earlier point, which states that research and data are vital. If you can show how your project will bring recognition and / or support to your school, getting their buy-in is going to be easier. Be sure to ask others to share what they see as the potential benefits of your project.

Manufacturing Professional Shares Why He Supports Local Camp as a Mentor and Tour Host

By Bryan Hawkins, President and CEO of Hawkeye Industries Inc

I've been volunteering for activities involving young people for decades. Like many, it has included things like scouting, organized sports, religious events, the arts, and educational activities. Later in life, I continue to be invited to share my entrepreneurship story with local school classes. Then, I was introduced to the manufacturing camp concept that was developed by NBT. The notion of having organized events to introduce small groups of young people to the advanced manufacturing career path that had been so positive for me; and to be able to help them "connect the dots" between education and a

career was an opportunity I just couldn't pass up. I was all in!

For the past nine years I've been a camp organizer, mentor, and instructor. I will never tire of seeing the gleam that kids get in their eyes when they experience something they've never done before — like operate a CNC press brake, weld, or process metal with a million-dollar CNC laser. And, of course, I can never adequately express the joy that comes from reading notes from parents who tell how the camp experience has forever changed their child's outlook on life, work, and education — while at the same time, changing their own parental attitudes toward manufacturing as a career. These are barriers that are shattered in an NBT camp.

The skilled labor crisis in manufacturing today can only be resolved by industry in partnership with other stakeholders. We can't wait for others to do it for us. The steps we take today as individual manufacturers to share our dreams and the technology that fascinates us will hopefully plant a seed in the minds of the young people who will follow in our footsteps. Find a way to get involved in an NBT camp. You will never regret the time you spend or the money you invest. How can you place a value on changed lives? By valuing the lives you touch, you will represent many small victories for the future of our industry.



▲ **Bryan Hawkins,**
President and CEO
Hawkeye Industries Inc, Tupelo, Miss.
NBT Board of Directors, 2011-2015

APPENDIX C

Helpful Hints for Successful Partner and Supporter Requests:

1. Start with companies your school already knows. Employers who regularly look to your school when recruiting new workers should be your first choice.

2. If there are employers you've not worked with before, but you think students would be excited to see their plant because of the products being made or the technology they use, reach out and ask if they might be able to help you with a plant tour.

3. Who you contact in a first cold call depends on the size and type of company. Check their website and look for an About Us page.

You may learn enough there to guide your choice of a contact. The right person might be in marketing, public relations, human resources, or even production management. With smaller companies it may be easier to reach a decision-maker than in very large corporations, but even those very large companies generally have one or more community outreach positions on their staff.

4. When you make your contact, be sure to provide basic detail information about your camp and when their help will be needed (dates and times). Don't hesitate to send them to the NBT website for more information about the camp concept. It can be helpful for them to know that you

are doing this as part of a long-running national program. Use www.nbtfoundation.org/camps as the link you send them to.

5. Start making your partner requests very early in your grant application process. You want to give employers plenty of time to think about how they will fit your group's needs into their regular routine. Given enough time, they may even help! You need to have at least a couple of partners in place before you submit your application for a grant to NBT.



START A **CAMP** TODAY!