# Prologue

Hello,

If you are reading this then you are about to embark on a wonderful exploration into space sciences with your cub scout den, patrol, or pack. I have put together this document to outline what you can cover, who you can reach out to, and how to make it fun. I hope your experience is a success and that the youth come out of this with a newfound love for science and the tools we use to explain the world we live in and beyond.

If you are new to the STEM/NOVA program with BSA, let me just cover some of the basics. STEM stands for Science, Technology, Engineering, and Mathematics. They are the core components in logic and deductive reasoning in our world today, a skill that has been lost by most. For generations the US was the leader in many of these fields, but we have begun to stray from this path and it only hurts us as a nation. Children, myself included, were raised to believe that science and math were hard and that they weren’t important and nothing could be further from the truth. The BSA has always incorporated STEM components in their merit badges and advancement criteria, and the NOVA awards utilize those existing awards as well as some additional steps. **Tech Talk** focuses on the practical implementation of scientific knowledge. All NOVA awards follow these basic requirements:

1. Research for an hour. It doesn’t matter how (reading, video, movie etc), but it should be specific to the subject.
2. Earn one of the related rank’s elective Adventure loops or pin. Ones earned for another award should not count unless no other adventure is available.
3. Engage in a learning activity. This may have one or more facets, but is designed to involve the youth in research, critical reasoning, and presentation of their discoveries.
4. Visit somewhere where the subject in question is being used or performed.
5. Follow up with the NOVA counselor on what was learned.

I have incorporated a slideshow presentation and handouts for the youth that will cover every requirement of every question. For **Tech Talk**, you will perform all of steps 1 and 2, 3, 4, and 5. The following pages will help you to talk about the different subjects, provide questions that you can ask to get the youth thinking, and help to answer questions that may be asked.

NOVA awards, on average, should be accomplished in about a month’s timeframe. This gives the youth a chance to do their research, create their presentations, and discuss what they are learning along the way. Engage the youth in whatever activities you would like to in an environment that works for them, but they will learn best by doing. Follow the Leading EDGE and Teaching EDGE philosophies. I wish you the best of luck in your adventure.

Corey Peoples

Pack 455, NSC, C250-17-1

# Slide 1 - Beginning

Introduce yourself and the excitement with the youth. Why did you choose to lead this award? What’s your passion for technology?

# Slide 2 - Agenda

Read verbatim or paraphrase:

The goal of this STEM course is to teach us how technology is used in everything and our everyday lives. We will start off by selecting a book from the library, or watch a movie [akela, you decide]. Then there is an adventure loop that we will earn later for your rank. For number 3, we will get into what technology is and how we incorporate it into everything, and how it has changed over time. Next week, we will Visit a location and through it all we will discuss what technology has done for us.

# Slide 3 – Learn for an Hour

There is an attached page in the Youth Worksheets document that covers the questions to follow up with reading. Be sure to print this out for each of the youth. Read verbatim or paraphrase:

Our first requirement is going to be to learn for an hour. I would like everyone to [Join me in watching a TV show or movie | Select a book from the library | select from some technology Youtube videos]. During this learning process, I want you to tell me about what technology you see and how it benefits the people using it.

# Slide 4 – Group Activity – Rank Adventure

This slide can be used to do an adventure loop for the rank. Should this not be an option, a.k.a. the award was earned for another purpose already, then skip to either slide 5 or 6. Read verbatim or paraphrase:

We are also going to earn an adventure loop. There are a few to choose from, but the adventure loop we selected is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for you. That will be done (now, later, on another day, at home, etc). While we work on this adventure loop, I want you to keep in mind what technology is used in it. How ha it also developed over time?

# Slide 5 – Group Activity – Computers

Read verbatim or paraphrase:

Computers are what we typically think of when someone says Technology. They are the peak of our technical progress, and allow for data storage and automation. When it comes to computers, there are 3 basic properties of them. Input (keyboard, mouse, microphone), processing (Central Processing Unit), and output (monitor, speakers, printer). Looking at this picture, lets label the parts.

# Slide 6 – Group Activity – Cameras

Read verbatim or paraphrase:

Cameras were invented at the turn of the 20th century and have advanced drastically since then. Today’s digital cameras operate differently than old film style cameras, but the functionality hasn’t changed. A lens focuses the light and captures the image on film or a digital sensor when the capture button is pushed. If the light is low, a built in flash can create artificial light and illuminate the object being photographed. Tell me about the different parts that are outlined here!

Photographs allow us to share ideas and experiences with unbelievable accuracy. There is a saying that “A picture is worth a thousand words.” What benefits do you see pictures and photography in our modern day? Where do you see pictures?

For our next meeting, I want everyone to go out and take 10 or more pictures. Come back, and share them with us.

# Slide 7 – Learning Adventure Overview

Read verbatim or paraphrase:

Now it is time to cover our learning adventure. For Tech Talk, we are going to first define what technology is, and then we will look at how it works in different subjects of our lives.

# Slide 8 – What is Technology

One of the answers here is correct, and the rest are not. #2 is correct. #3 is the definition of science. The rest are fairly random. Read through each and have the youth try to figure out what is the correct answer. Use the page titled Technology Everyday in the attached youth worksheets document for this and the following slides.

# Slide 9 – Tech in Communication

Read verbatim or paraphrase:

Long ago, if we wanted to talk to someone we would have to physically meet them. This could mean that person might never speak with anyone outside of their town. Once a post mail system was created, it became easier for humans to communicate long distances by sending a letter, but it was incredibly slow because it had to be transported by a person, either by horse or by train, and letters can’t show emotion. Until this man made his invention. This is Alexander Graham Bell, and he invented the telephone. This revolutionary technology suddenly opened up the ability to communicate with someone a large distance away, in real time. All you had to know was what number to dial, and there weren’t a lot of phones because they didn’t have phone lines run to every house for a long time.

# Slide 10 – Tech in Communication

Read verbatim or paraphrase:

Today, that phone system has evolved using computer technology. We want everything cordless and interconnected, so we are no longer bound to us or the people we are calling having to be at a certain physical location. Now it is your turn. Pick some aspect of communication and tell me how it has changed over time.

# Slide 11 – Tech in Business

Read verbatim or paraphrase:

 There is a lot to running a business. You have to keep track of your products, your customers, your employees, your money, and it takes a lot. You might have to manage the people, be an accountant, be a salesperson, be a customer relations expert, and everything else you could possibly conceive. The larger the company gets, the more work is expected to maintain the business and even more is required to grow it. Long ago, anything that needed to be kept had to be written on paper and filed away for however long you needed to keep it.

# Slide 12 – Tech in Business

Read verbatim or paraphrase:

Business itself has gotten harder because more people have opportunities to create similar companies, so now there is more competition. What has changed the most, though, is being able to file away what you need to digitally and access it from anywhere in the world. You no longer have to keep stacks of paper in a file room at your office and be able to manage it entirely. Many companies are choosing to go paperless, where as much as is possible is done via electronic devices and storage. It makes it easier for the business and easier for customers too. Not everything can be paperless, though…

# Slide 13 – Tech in Business

Read verbatim or paraphrase:

Definitely one place you don’t want to be without paper! So tell me, how do you see technology used in businesses?

# Slide 14 – Tech in Construction

Read verbatim or paraphrase:

In the past, construction projects were hard manual work. Moving things, building upwards, even something as simple as getting tools, all had to be done manually. Can you imagine if you had to make your own nails to build a treehouse? Or have to cut down a tree for the wood to build a treehouse?

# Slide 15 – Tech in Construction

Read verbatim or paraphrase:

Now we can take something that’s heavy and use large machines to place it for us, so we can build large structures with precision but not have to have 200 people to move one object. Here’s a fun video of a bridge building car in China. Let’s watch how these people can build a train bridge using this.

[watch video]

Now, how do you see technology in construction?

# Slide 16 – Tech in Sports

Read verbatim or paraphrase:

In sports, long ago if you wanted to watch a game, you had to physically be there. This is an ancient Mayan game called Pok A Tok, very similar to the Basketball we know today. If you wanted to watch the game, you had to be there. It was that way for thousands of years.

# Slide 17 – Tech in Sports

Read verbatim or paraphrase:

In the year 1894, radios were invented. As the technology became more abundant, it was easier for people to hear about sports event because they could listen to announcers talk about it in real time. Now, you could hear what was happening in your favorite sports events without having to be there. Like reading a book, you would use your imagination to see the game in your mind.

# Slide 18 – Tech in Sports

Read verbatim or paraphrase:

Now, not only can we watch the actual sports games on television, we can create our own virtual sports games any time we want to thanks to video games. Every game is unique and fun for anyone who enjoys the games. How do you see technology in sports?

# Slide 19 – Tech in Entertainment

Read verbatim or paraphrase:

Does anybody know what building this is? This is the Globe Theater. It’s where William Shakespeare’s plays were performed. If you wanted to see one of his plays, you would have to travel all the way to London to see it, wait in line, and hope that you would be able to get in. Plays had been around for longer than recorded history and that was the way it always was.

# Slide 20 – Tech in Entertainment

Read verbatim or paraphrase:

But welcome to the turn of the 20th century. Technology was developed that could capture light from an object and store it on a specially coated film. We know it today as a camera. It used to be big, slow, and expensive, but it was amazing technology that allowed you to capture a still image.

# Slide 21 – Tech in Entertainment

Read verbatim or paraphrase:

There was another children’s toy called a Zoetrope. It was a cylinder that had pictures on the inside and slits so that you could see the inside of it through the outside. When you spun it around, the pictures would appear to move because your eyes and your brain would be tricked into thinking it moved normally. Imagine what could happen if we took camera pictures and zoetrope technology and combined the two?

# Slide 22 – Tech in Entertainment

Read verbatim or paraphrase:

That is the invention of the film industry! Movies as we know it today are a bunch of still frames that shutter in much the same way. The first pictures, like this one from the 1920s called Girl on the pavement, were only the video because we didn’t have the technology to play audio perfectly synchronized. As a result, we would get the video to play and usually just have piano music playing in the background. Any words that needed to be said were written, but usually the films in this silent movie era were more about actions.

# Slide 23 – Tech in Entertainment

Read verbatim or paraphrase:

Today, of course, movies don’t even need to be filmed. We can use computers to draw out the things we want to see which has opened up a whole new realm of imagination. Now it’s your turn. What does technology in entertainment look like to you?

# Slide 24 – Visit where Technology is in use

This part needs to be planned out ahead of time. Read verbatim or paraphrase:

We are going to visit \_\_\_\_\_\_\_\_\_\_\_\_\_\_, a place where technology is in active use. As you can see by the number of types of places and businesses to go to, technology is everywhere.

# Slide 25 – Visit where Technology is in use

Read verbatim or paraphrase:

When we go, we need to talk to someone who works there about the technology they use. Find out how it has changed over time. Find out how it makes their job easier. Ask them why they use this technology. You could even ask them why the do what they do.

# Slide 26 – Group Discussion – Thank you

Read verbatim or paraphrase:

So let’s summarize what we learned today. What is technology (get the answer from the youth)? How does it impact your everyday life? How has it changed over the years? What sort of jobs use technology? What questions do you have for me?

# Final Thoughts

Akela,

Thank you so much for running this. I hope that you have had as much fun as the youth. Be sure to turn in whatever documentation is required to your advancement chair so that the youth earn both their NOVA award and their adventure rank.