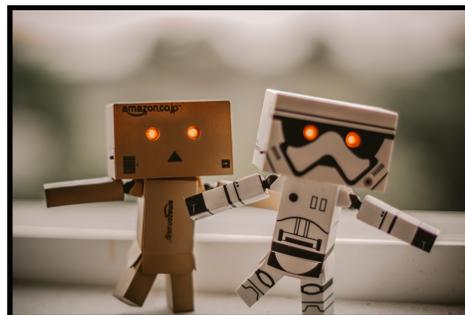


## **SUPERNOVA SUPERHIGHWAY:** Tips for Creative Mentorship

Regardless if you are going for the Luis Alvarez or Charles Townes qualifications, **success hinges on an excellent Plan A and a little Plan B on the side to support confidence in positive outcomes.**

**Be creative!** Anticipate STEM concepts as an integrated aspect of almost every Pack meeting; don't ask first if boys would like to try it—do them a big favor and introduce STEM to them naturally and they will respond with awe and excitement.



**DO:** Launch directly into STEM-related activities and achievements without advertising it as anything other than AMAZING; their curiosity and joy in achievement will naturally keep them actively engaged and hungry for more. STEM is an instant reward system; even if an experiment



fails to produce anticipated results, the student is touching, observing, and doing new operations that stimulate; the student gains self-confidence in the realization that they are not only capable of success, but they can problem-solve and know that they did it themselves.

**DON'T:** Ask the boys if they want to do math and science; their limited life experience is not an ideal modifier for free choice—they don't know! Whatever negative experiences or perceptions they

may have about math and science can easily and quickly be replaced with every victory they achieve with fabulous, beautiful, exciting STEM!

### **Plan in advance; know how to bridge from the Adventure to the Nova and**

**Supernova:** Faithfully recording progress is also essential. Take a week or two to review the handbook for both the Novas and Supernovas. Network with others for attention-getting ideas and techniques; begin gathering your committed resources in people, materials, and ideas.

**Create a folder for each adventure:** List on the outside how each can be expanded to which Nova or Supernova be it for the wolf and Bear (Alvarez) or Webelos (Townes). On each folder for each Nova I had written how each adventure ties in to which portion of the Nova. It may seem like a lot of work, but taking the time to get a curriculum in order by July before you go into the year is a lifesaver and could mean the difference between frustration or engagement.

**Video resources:** Each individual Nova requires Scouts to view an episode about an hour long related to science. One convenient way to find this resource is at your local library. PBS produced

videos offer a great variety of excellent and engaging themes. If your video of choice is too short, find two movies or supplement the time requirement by featuring STEM-related videos on Youtube. Carefully preview in advance any material intended for the Scouts.

**Make it FUN:** Prepare a fun movie night! Find videos related to the Adventures that also will reward participants with an earned belt loop. Lay a sheet or picnic blanket out and pop some corn. After the movie, complete the requirement by asking provocative questions the boys try to answer. Next, select a complementary adventure and complete it to satisfy both number one and two requirements on all the Novas. You will notice the rest of those Novas with the adventure are requirements related to the adventures. Do all of the adventures for each rank under number two. You can easily expand the adventures to include whatever else the group needs.

### **Make it WAY FUN: Curiosity inspires learning!**

When you preview content of a video, note specific key concepts or memorable facts or quotes featured in the video. Write these down as individual tidbits, questions, riddles, or silly leading statements on small strips of paper about 5-6" long and less than 1" wide. Roll these up tightly around a pencil and they will keep their rolled shape; toss them into the individual bag or bowl of



popcorn served to each boy so they will find it right away (as opposed to buried deep). For example: A video on plant biology might inspire cues such as "This is a shoot that you can't shoot from a gun", or "A stalk takes stock in my structural security", and "A stem transports delicious cherry limeade from the roots to the leaves", "Pollination must happen before this can happen - "...anything that prompts them to start thinking and talking BEFORE they see the video. After popcorn has been distributed, occupy yourself with something else before the movie starts and wait to hear their reaction as boys one by one discover curled up cryptic messages sitting on top of their popcorn. Act surprised - say things like, "What on earth? I wonder what that means?! Weird!" Do not answer any questions; play deliciously clueless.

**Now start the video.**

**Make concept recognition totally more FUN:** Also in advance of the movie night with the loaded popcorn and with your list of cues/concepts you jotted down on the popcorn paper surprises, create and print for teams of two boys a **custom word search** or **crossword puzzle** from a free puzzle-making website to give them a chance to fill it out AFTER they view the movie. This is fast and easy! In fact, you could ask the boys to make their own list of key words or concepts and show them how to choose a puzzle template, input the words, and print their custom puzzle. Try these custom templates for starters:



[http://puzzlemaker.discoveryeducation.com/CrissCrossSetupForm.asp?campaign=flyout\\_teachers\\_puzzle\\_crisscross](http://puzzlemaker.discoveryeducation.com/CrissCrossSetupForm.asp?campaign=flyout_teachers_puzzle_crisscross)

<https://www.puzzle-maker.com/CW/>

[http://www.abcya.com/crossword\\_puzzle\\_maker.htm](http://www.abcya.com/crossword_puzzle_maker.htm)

**Adventure requirements & flexibility:** The intention of having a Plan B in your toolkit is to be able to shorten one activity and introduce another if necessary to maintain interest. Be flexible; it's okay to accomplish part of one adventure and switch to another adventure element, sign off on that, and conclude with something refreshing and challenging such as decoding a secret spy message or playing a game the boys invented.

**ADVENTURE helpful hints:** An archaeology-related adventure titled, "Digging in the Past" is an example of how requirements 1 and 2 will be completed while the adventure is underway. This is a pattern repeated in most of the program adventures and challenges.

•Display a poster board with the steps for the Scientific

Method for young explorers to refer to

- Offer different tools to dig into the cast or whatever (a tray of litter or sand with buried items, etc.) and ask the boys to choose from the tools displayed (plastic spoons, different size paint brushes, plastic forks, etc.) those tools they believe will be the most helpful for their purpose
- Organize Scouts into teams or do individual ones for each boy before they begin excavating for the items listed
- A fun "polar excavation" might be an artifact or items buried in a plastic container of ice. For a den of 6 to eight boys a small Tupperware or plastic lined paper bowl and a package of 8 dinosaurs from a dollar store is a winning combination! This can be done once they have learned how to use a hammer or pallet, a small screwdriver, and hot water to brush on and melt the ice so the item encased is not damaged
- Analyze afterwards if their initial tool choice was appropriate. Review the method employed; identify mistakes that were made and why they may have had to repeat their effort using an alternative hypothesis
- This works out great because then you can show a short video about scientist Thomas Edison, a classic personal example of many disappointing failures that eventually led to enormous success. Now they have learned about a scientist as well as completing a requirement for the Supernova

### **Be familiar with entities that offer STEM programs or facilities that are STEM-related:**

- Public libraries regularly host stem projects. One example is a marble run day which conveniently bridges to another adventure. Check out the library calendar of events often
- ASU hosts a free Saturday Science program every year. This one event satisfies an introduction to planets, stars and constellations, water erosion, and so much more

- For camp-outs (especially in the winter) you may head south and stay at Catalina State Park. Arrange a visit well in advance to the Pima Air and Space facility; be familiar with their calendar of events and select a weekend they are sponsoring a STEM event. The Museum may give your group a discount and let you leave the museum to have lunch in the parking lot
- Grocery store tours (Fry's will facilitate this; see meat processing & equipment, warehouse & dock action, etc.)
- Phoenix Public Transit tour for kids-fascinating and free for Kindergartners with a guide to explain different forms of public transit and how to get from point A to point B
- Take tours at a water filtration plant or some other enterprise or production center; see these links for cool ideas—some are free and some require tickets:
  - **Behind the Scenes Tours:** <https://www.tripsavvy.com/factory-and-behind-the-scenes-tours-2681150>
  - **Plant Science Tour Botanical Garden:** <https://www.dbg.org/events/hazel-hare-center-plant-science-tours>
  - **Amazon Fulfillment Center Tour:** <http://amazonfctours.com/tour-an-amazon-fulfillment-center/>
  - **Pretzel Factory Tour:** <https://www.facebook.com/pages/Snyders-of-Hanover/147341035285064>
  - **Engineering for Kids:** <https://www.engineeringforkids.com/locations/arizona/>
  - **Free Museums for Kids:** <https://www.tripsavvy.com/free-museums-in-greater-phoenix-2681694>
  - **13 Museums Kids Will Love:** <https://www.azcentral.com/story/life/kids/2014/08/22/phoenix-area-museums-kids-will-love/14444841/>
  - **Dairy Farm Tours:** <https://azbigmedia.com/shamrock-farms-dairy-tour/>; <http://superstitionfarmaz.com/>; (Butter-making Tour: <http://www.danzeisendairy.com/>)
  - **8 Behind the Scenes Tours:** <https://www.wheretraveler.com/phoenix-scottsdale/insider-scoop-8-unique-behind-scenes-tours-metro-phoenix>
  - **Wild at Heart** (Call to ask if tours are available: They advertise over 100 Eagle Scout Service Projects completed at their facility so they ought to indulge Eagle wannabes in the making...) <https://wildatheartaptors.org/education/>
- Plan ahead for a tour at the County animal adoption center to meet with vets and technicians; observe animals as patients in the hospital; encourage the Scouts to ask questions. Make this tour an instant Pack Summertime Activity as an easy bonus; ask kids bring a bag of pet food, a toy, or a blanket, and the activity just served as a service project, too
- Camp out near a geological, archaeological site or Native American ruins. Let the ranger or visitor's center know you are coming and the tour is usually free. Kids enjoy an energy-burning hike in and guided tour with someone to answer questions
- Very few schools require science fair projects nowadays. Review school calendars; if a school is hosting a science fair, try to have the Pack attend and enjoy the inspiration of their peers

- Set aside a Saturday and hold your own science fair for your den. The first Saturday of December in place of Den meetings is an opportune time for an all day event. Kids bring a sack lunch; several experiments are conducted in the morning and building projects conducted in the afternoon. Before each experiment, the Scouts view a short video about a scientist that had been pre-selected to compliment a specific experiment. A review of the work by Archimedes inspired the construction of simple catapults that were employed to fling well aimed marshmallows into the mouths of boys. Save projects for display at your next pack meeting. Boys man one item and explain the process and the scientist to other Scouts. A pot luck dinner is a great and inclusive end note.
- **Partner with talent/resources that are naturally invested in your success:** Always know the specialty skill-sets, talents or career experience of parents, older siblings, grandparents, aunts, uncles and other family members, neighbors, faith community members or clubs and organizations that may be willing to share. Invite them to teach a meeting component, an entire meeting, or an adventure. For example:
  - An engineer family member, neighbor, or faith community friend may conduct an adventure and bring many things for the kids to do and investigate such as classic, crowd-pleasing chemical reactions
  - You can request a military veteran family member to teach about the U. S. flag, the history and symbolism of it; discuss voting, citizenry, different communities within a community and how they interact with one another. They may speak about the communities the Scouts live in and how they interact with larger communities and identities
  - A fire fighter may share information about fire safety and the trust and cooperation within a firefighting crew to accomplish high-stress tasks in a risk-prone environment
  - A parent may teach cooking skills for camping with plenty of tasty, hot examples to sample
  - Find a parent skilled with foil packs and other clever, simple cooking methods; host a meeting at someone's home where boys cook their own meals. A newly elected Denner ceremony can conveniently be held during the cooking time. A backyard camping night might be the ticket to help the new Den member catch up



#### **Take advantage of local or regional phenomenon:**

- The eclipse of 2017 really inspired Scouts especially after Council sent out what eclipse-related activities would count for STEM achievements.
- An annual phenomenon is the wild flower blooming season in the **Sonoran Desert:** [http://www.desertmuseum.org/programs/flw\\_predicting.php](http://www.desertmuseum.org/programs/flw_predicting.php)
- **Hummingbird watching:** <http://www.birdsandblooms.com/blog/best-sites-viewing-hummingbird-species-southeast-arizona/>
- **Butterfly Wonderland:** [https://www.tripadvisor.com/Attraction\\_Review-g31350-d4288742-Reviews-Butterfly\\_Wonderland-Scottsdale\\_Arizona.html](https://www.tripadvisor.com/Attraction_Review-g31350-d4288742-Reviews-Butterfly_Wonderland-Scottsdale_Arizona.html)

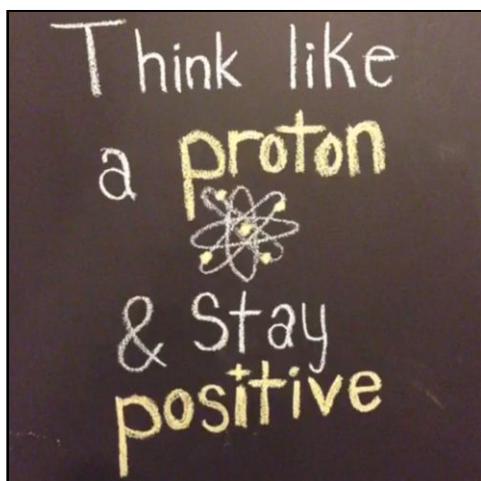
**NETWORK-NETWORK-NETWORK:** Sharing is caring! The Webelos one and two leaders could meet two to four times a year and share meetings such as Engineering and others that feature guest speakers/presenters.

- YouTube and Pinterest identify countless exciting ideas like stomp rockets and kid-friendly experiments with handy and creative home materials

- **This might be Supernova but you don't have to be a Superman or woman! Work together to help each other out: Utilize a sign up sheet with parents who support set up, activity facilitation, and clean up**



- Network with neighboring Boy Scout Troops for effective and motivating mentoring boy to boy
- Introduce yourself to Boy Scout Troops; go on camp-outs with them and expand your human and material resources with friendship and goal-sharing
- You can ask school science teachers to visit your meeting and let them know what you need. Many will bring classroom supplies and teach without cost. You may consider a thank you note from each child and a certificate or a \$25 gift card if every family chipped in a few dollars
- Consider law enforcement as a valuable and exciting resource; inquire if their canine unit or another representative is available to share with you
- A naturalist could join your nature walks to explain and identify botanical features and wildlife
- Persons with disabilities may explain the Aware and Care ethic; demonstrate COPD by breathing through a straw; use blind-folds or earplugs; share insights about invisible disabilities such as Aspergers and other neurological conditions or psychological conditions. Valuable online disability simulations as only 2-3 minute videos will turn upside down any preconceived notions about what living with a disability is really like. For example:
- **Dyslexia simulation:** [https://www.youtube.com/watch?v=zEG-QChd\\_aQ](https://www.youtube.com/watch?v=zEG-QChd_aQ) ; **HDHD simulation:** <https://www.youtube.com/watch?v=xfo1tZ95Ypk> ; **Hearing loss simulation:** <https://www.youtube.com/watch?v=PbBZjT7nuoA> ; **Anxiety disorder:** <https://www.youtube.com/watch?v=QSra729OuDs> - and many, many more
- **TED Talks** are a great resource in almost any topic. This particular presentation by a 15 yr old boy with **Asperger's Syndrome** is inspirational: <https://www.youtube.com/watch?v=inxIM1aGvZY>



*Anyone can do this—a PhD in physics is not required. Wherever you are, opportunities to introduce young people to a new sense of wonder for their world and confidence in themselves naturally abound within the principles of STEM.*

**Have fun with it!**

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