

STEM Advancement Opportunities

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Scouting and STEM

- STEM has always been a part of Scouting
- Technology, conservation, engineering, math, teamwork

- Fits into our mission
 - Help other people at all times
 - Keep myself mentally awake
 - Helpful, Thrifty, Clean
 - Brave and Keep myself morally straight

STEM is Fun

- Hands-on
- Can be outdoors
- Often “something new” for Scouts
- Explore it differently than it’s done in school

STEM in current Cub Scout Program

- Outdoors
- Conservation award
- Some adventures
- Novas and Supernovas
- Few Scouts earn the Novas and Supernovas
- Novas and Supernovas have been supported at council level (not National) since spring 2022
- Conservation Award is also earned less than would be expected

STEM in the updated Cub Scout Program

- Required Outdoors adventure at each rank
- Elective S T E M adventures at each rank
- Elective Champions for Nature at each rank
- Many other adventures also have STEM components

STEM Adventures

BOLD indicates
new adventure
Italics indicate
existing adventure



Kindergarten



1st Grade



2nd Grade



3rd Grade



4th Grade



5th Grade

STEM						
Science	<i>Ready Set Grow</i>	<i>Sky Is the Limit</i>	<i>Digging in the Past</i>	<i>Forensics</i>	<i>Earth Rocks!</i>	<i>Into the Woods</i>
Technology	Everyday Tech	Tech All Around	Computing Wolves	Top Chef Tech	Tech on the Trail	High Tech Outdoors
Engineering	<i>Gizmos and Gadgets</i>	Designed by Tiger	<i>Air of the Wolf</i>	Baloo the Builder	Modular Design	<i>Engineer</i>
Math	Count on Me	Stories in Shapes	<i>Code of the Wolf</i>	Balancing Bears	Math on the Trail	Estimations

For example, in the updated Cub Scout Program ...

Wolf STEM Adventures

Digging in the Past - Dinosaurs and fossils

Computing Wolves - Components of computers as well as digital safety

Air of the Wolf - Experiment with paper (and non-paper) flying objects

Code of the Wolf - Codes, patterns, and beginning statistics

Finding Your Way - Maps, compasses, and navigation

Germs Alive! - Washing hands and spreading germs

Spirit of the Water - Water sources, pollution, conservation

Champions for Nature - Renewable natural resources and recycling

Paws on the Path - Outdoor Code and Leave No Trace

Secret Code Example: ROT-13

ABCDEFGHIJKLM

NOPQRSTUVWXYZ

SAFETY

becomes

FNSRGL

Practice:
Encode a word
from the Scout Law
and hand it to your
neighbor

Scouts BSA Rank Requirements

- First Aid
- Determining amount of food to buy
- Plants and animals
- Appropriate campsite setup
- Navigation
- Appropriate use of technology
- Technology of camping and hiking gear

Scouts BSA Merit Badges

Eagle Required

Environmental Science or Sustainability

First Aid

Lifesaving or Emergency Preparedness

Others

Animal Science

Animation

Astronomy

Automotive

Maintenance

Aviation

Bird Study

Chemistry

Composite Materials

Dentistry

Digital Technology

Drafting

Electricity

Electronics

Energy

Engineering

Farm Mechanics

Fire safety

Fish & Wildlife

Management

Forestry

Geocaching

Health Care

Professions

Insect Study

Inventing

Mammal Study

Mining in Society

Model Design and

Building

Nature

Nuclear Science

Oceanography

Orienteering

Plant Science

Plumbing

Programming

Public Health

Pulp and Paper

Radio

Reptile &

Amphibian Study

Robotics

Safety

Search and Rescue

Signs, Signals,

and Codes

Soil and Water

Conservation

Space Exploration

Surveying

Truck Transportation

Weather

Welding

Scouts BSA World Conservation Award

- https://www.scouting.org/wp-content/uploads/2019/10/World_Conservation_Application-Scouts-BSA-1.pdf

This program is designed to make youth members aware that all nations are closely related through natural resources, and that we and our world environment are interdependent

- Environmental Science OR Sustainability
- Soil and Water Conservation OR Fish and Wildlife Management
- Citizenship in the World

AND

- Participate in a conservation project as part of an approved Scouting program totaling at least three hours that addresses a conservation need common to more than one country

Scouts BSA Distinguished Conservation Service Award

- <https://www.scouting.org/outdoor-programs/conservation-and-environment/conservation-awards-and-recognitions/bsa-distinguished-conservation-service-award/>
- Two conservation service projects in two different areas
 - One can be Eagle Scout Leadership Service Project
 - Another of similar level in a different topic area
 - Second project can benefit BSA
- We have had two of these in the past few years

Scouts BSA Nova and Supernova

- <https://www.scouting.org/stem-nova-awards/awards/scouts-bsa/>
- Themes for Nova
 - For example
 - Up and Away - fluid dynamics
 - Start Your Engines - energy sources and transportation
- Can do Novas in a group with a Nova Counselor (registered position)
- Supernovas are more involved like science fair projects
 - We have had very few over the years
 - Individual not group
 - Supernova mentor (registered position; can't be Scout's parent)

Lion STEM Adventures

Count on Me - counting games, shape categories

Everyday Tech - digital technology used in home

Gizmos and Gadgets - explore properties of motion

Ready, Set, Grow - plant a garden

Mountain Lion - 6 Essentials, walk outside

Champions for Nature - natural versus man-made

Fun on the Run - Hand washing, nutrition

Tiger STEM Adventures

Sky is the Limit - Night sky, looking through binoculars (or telescope or camera)

Stories in Shapes - Shapes in environment, sign language

Tech All Around - Using Digital Technology in home

Designed by Tiger - Planning, building, evaluating, revising

Tigers in the Wild - 6 Essentials, Outdoor Code, animals and trees

Curiosity, Intrigue, and Magical Mysteries - Magic tricks and writing in codes

Champions for Nature - Renewable natural resources and recycling

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Bear STEM Adventures

Forensics - Investigate the crime scene

Top Chef Tech - Kitchen tools and apps

Baloo the Builder - Choose, plan, and build

Champions of Nature - Wastewater and pollution

Bear Habitat - Leave No Trace

Balancing Bears - Symmetry and patterns

Marble Madness - Marble physics

Super Science - Various investigations

Webelos STEM Adventures

Earth Rocks! - geology

Math on the Trail - hiking pace, distance

Build It - Carpentry including plumb, level, and square

Modular Design - building models and creating instructions

Tech on the Trail - GPS and mapping

Champions for Nature - habitats and endangered species

Race Time - explore friction

Yoyo - physics

Webelos Walkabout - first aid, weather, BSA SAFE

My Safety - Hazardous items and being prepared for natural events

Arrow of Light STEM Adventures

Into the Woods - Trees

Into the Wild - Animals and ecosystems

High Tech Outdoors - Apps for weather and knots

Engineer - Project blueprints and engineering process

Estimations - Amount of food needed, time, distance

Champions for Nature - Food creation and waste

Outdoor Adventurer - Choose campsite

First Aid - Hurry cases, create first aid kit

Den Leaders aren't Experts in STEM

- Remember Fun. Simple. Easy.
- Den Leader Resources will support the Adventures with activities
 - there will be hundreds of activity cards with options
- Can use a variety of resources
 - parents with expertise (get them involved)
 - older Scouts / Den Chiefs or just visitors (Order of the Arrow?)
 - museums / parks

Updated Code of the Wolf Requirements

1. Create a secret code. Send a message to a member of your den or family. Have that person send a message back to you using the same secret code.
2. Build and play a game that requires the use of codes or patterns.
3. Select a single shape. Observe the environment around you. Write down where you see that shape and how it is being used.
4. Using a package that contains a number of different colored items, discover the most common color.

Activity Cards for Den Leaders (and other helpers)

Location

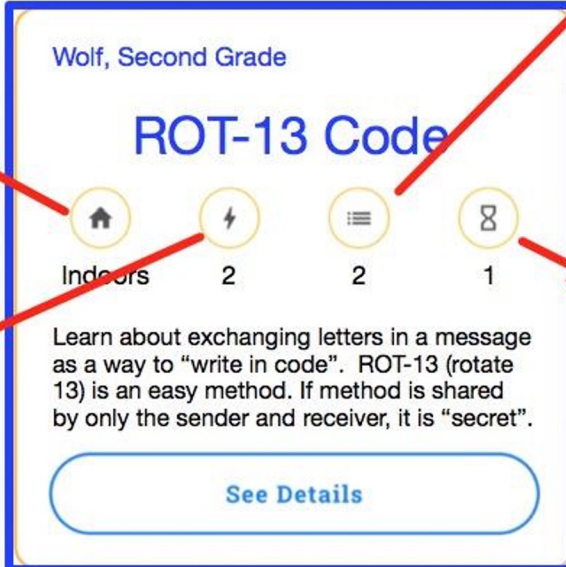
-  Indoor
-  Outdoor
-  Travel

Energy Level

- 1- Very low energy - listening
- 2- Low energy — crafts
- 3- Moderate energy — skilled crafts
- 4- High energy — active movements
- 5- Very high energy — running

Requirement 1

Create a secret code.
Send a message to a ...



Wolf, Second Grade

ROT-13 Code

Indoors 2 2 1

Learn about exchanging letters in a message as a way to "write in code". ROT-13 (rotate 13) is an easy method. If method is shared by only the sender and receiver, it is "secret".

[See Details](#)

The activity card is a blue-bordered box containing the title 'ROT-13 Code', a list of icons with energy levels (Indoors, 2, 2, 1), a description of the activity, and a 'See Details' button. Red arrows point from the 'Indoors' icon to the 'Indoor' location category, from the first '2' to the 'Low energy' energy level, and from the '1' to the 'No prep time' prep time category.

Supplies

1. None — no supplies are needed
2. Very little — common household items
- 3- Average - low-cost craft supplies
- 4- Above average — common craft supplies
- 5- Custom — custom or uncommon

Prep Time

1. No prep time needed
2. One to three days ahead of time
3. Three to five days ahead of time
4. A week ahead of time
5. More than a week ahead of time

This is not an actual Activity Card

Fun STEM Activities don't have to be Adventures

- ice cream in a bag
- flashlight comparisons
- hidden treasure maps
- hikes/walks with example shapes, colors, and textures
- density experiment
- flying objects
- magic tricks

Keep the Scouts curious and engaged with fun STEM
Especially if it is **STEM in the Outdoors**

How to Help the Packs

- Start with Electives in the summer
- Get the Scouts outdoors having fun
- Offer to help with adventures within your expertise and interest
- Develop older Scouts (Den Chiefs?) as resources who can help with specific activities
- Check with related merit badge counselors (engineering?)
- Other ideas?

STEM with Cub Scouts can be

Fun

Simple

Easy