Science Camp #160706.7

06-08 July 2016 @ the Condo, the Nelson Cabin, and surrounding area

Advisors

H. Roice Nelson, Jr., Andrea S. Nelson, Paul F. Nelson, Benjamin B. Nelson, & Jared Wright

Attendees

Ethan E. Nelson, Grant M. Nelson, Colby C. Wright, Taylor R. Wright, Ella D. Nelson, Halle N. Wright, Bobbie Sophia Waldron (pre-visit & via video), Dallin Spencer Nelson, Rachel Lee, & Ian Lee

Past Science Camp Themes & Sites Visited

- 1. Nelson Cabin, Fishing, Condensation, Water Coloring, and Music
 - 1. Nelson Cabin
 - 2. Panquitch Lake
 - 3. Swimming at Cedar City Aquatics Center
- 2. Mining Range, Frisco, Silver Reef, Iron Town, Astronomy at Frisco Peak, Archery
 - 1. Nelson Cabin, Kolob Reservoir, Silver Reef, Snow Canyon, Volcano
 - 2. Parowan Gap, Rack Range Mines, Frisco, Frisco UU Telescope
 - 3. Iron Mine, Iron Town
- 3. Geocaching, Mammoth Cave, Cascade Falls, and Cedar City Cemetery
 - 1. Nelson Farm, Fiddler's Canyon,
 - 2. Boys to Mammoth Cave, Cascade Falls and Girls to St. George and Pottery Making
 - 3. Cedar City Cemetery
- 4. Volcanoes, Classy Closets, Maps, Surveying, Sand Painting, and Genealogy
 - Condo, Snow Canyon Volcanoes, Classy Closets, Fiddler's Canyon
 - 2. Nelson Farm to survey, Nelson Cabin
 - 3. Cedar City 24th of July Parade
- 5. Patterns, Horse Riding, Internet, Be-a-man-campout
 - 1. Dust Devil Ranch, InfoWest, Fiddler's Canyon
 - 2. Nelson Cabin
 - 3. Cedar City July 4th Parade
- 6. Music & Spoken Word, SilencerCo, Indian Tribes & Archaeology, Solar Astronomy
 - 1. Family Discovery Center, Sophie & Dallin's Baptism, SilencerCo, Music & Spoken Word, UU Science Museum
 - 2. Freemont Indian Museum, Boulder Anasazi Ruins, Escalante Petrified Forest, Bryce Canyon
 - 3. Parowan Gap, Solar Astronomy, Nelson Cabin, Uncle Des' & Aunt Sara's, Swimming
- 7. Rock Cutting, SUU Museum, Computer Hardware and Software, Cabin

Safety

- Never go anyplace alone.
- Exception is if one of you is hurt, then:
 - One of you stay and help the person hurt.
 - The other one run and get help.
- If you get lost stay put, we will find you.
- If you hear a rattlesnake do not move quickly, just slowly move away from the sound.
- Do not run with a knife open. Use knife safety.
- If you cut yourself, apply pressure to the wound to stop bleeding, and send for help.
- Never point an arrow in a cocked bow or a gun at any person.
- Drink lots and lots and lots of water.
- Do not go swimming unless an adult is with you.
- Do not start branches on fire and swing them around where others can be hurt.
- Have fun, use common sense, and <u>think before you act</u>.



Schedule Friday - Saturday

- Friday, 01 July 2016:
 - Nelson Reunion at Frontier Homestead Museum.
 - Grandpa and cousins singing "My Farm" with words written by his Grandma Nelson.
- Saturday, 02 July 2016:
 - Nelson Reunion breakfast through lunch with lamb-burgers.
 - Paul, Grant, Ella, and Dallin Nelson and Sophie Waldron arrive. Possible astronomy activity.
- Sunday, 03 July 2016:
 - Church, Inter-Faith Fourth of July Concert.
- Monday, 04 July 2016:
 - Fourth of July breakfast and parade, Sophie to London via Salt Lake. Paul's Family in Cedar
- Tuesday, 05 July 2016
 - Hikes
 - Grandpa and Grandma Family History Center.
 - Jared, Melanie, Colby, Taylor, Halle, Avalyn, & Kendall Wright and Ben & Ethan Nelson arrive.
- Wednesday, 06 July 2016:
 - Fun Run/Walk, Rock Hunting at Bloody Ridge, SUU, Rock Cutting, Presentations, Cabin.
- Thursday, 07 July 2016:
 - Hardware, Software, Firmware, Media, Lego Robots, Races, Campfire Singing, Astronomy
- Friday, 08 July 2016:
 - Programming, Revisit Favorite Site, Marshmallow Guns, Water Rockets, Swimming.
- Saturday, 09 July 2016:
 - Carriage Rides and breakfast at Iron Springs, everyone but Grandpa & Grandma leaves.

Notes

Job Chart

	Tuesday	Wednesday	Thursday	Friday	Saturday
Ethan Nelson	Arrive	Presentation Breakfast Setup	Lunch Setup	Clean Cabin Dinner Setup	Leave
Grant Nelson	Fishing	Presentation Dinner Setup	Lunch Cleanup	Breakfast Setup Clean Cabin	Fishing
Colby Wright	Arrive Dinner Setup	Presentation Breakfast Cleanup	Dinner Setup	Lunch Cleanup Clean Cabin	Breakfast Setup
Taylor Wright	Arrive Dinner Cleanup	Presentation Breakfast Cleanup	Dinner Cleanup	Lunch Cleanup Clean Cabin	Breakfast Cleanup
Ella Nelson	Last Minute Shopping	Presentation Dinner Cleanup	Breakfast Cleanup	Lunch Cleanup Clean Cabin	Breakfast Setup
Halle Wright	Arrive Dinner Cleanup	Presentation Lunch Setup	Dinner Cleanup	Breakfast Setup Clean Cabin	Breakfast Cleanup
Dallin Nelson	Review Grandpa's Rocks	Presentation Dinner Cleanup	Lunch Cleanup	Breakfast Setup Clean Cabin	Breakfast Setup
Rachel Lee	Arrive	Presentation Lunch Cleanup	Breakfast Setup	Clean Cabin Dinner Cleanup	Breakfast Cleanup
lan Lee	Arrive	Presentation Lunch Cleanup	Breakfast Cleanup	Clean Cabin Dinner Cleanup	Breakfast Cleanup

Biggest Trout Pulled Out of The Lake-on-the-Hill by a Family Member H. Roice Nelson, Jr., Memorial Day, 30 May 2016, 21 inches, 4 pounds

Championship Fish





Day 1: Wednesday, 06 July 2016

- 1. Fun Run/Walk
- 2. Rock Hunting at Bloody Ridge
- 3. Southern Utah University
- 4. Lunch with Aunt Sara & Uncle Des
- 5. Rock Cutting
- 6. Presentations
- 7. Cabin

Award Certificate

Presented to

First Annual Fun Run with my 67 year old Grandpa Nelson, or Fun Walk with my 62 year old Grandma Nelson at The 7th Annual Nelson Grandkids Science Summer Camp



06 July 2016

Signed







Notes



5. Southern Utah Rock Club Rock Cutting Shop





Notes

6. Presentations

•	Ethan	
•	Grant	
•	Colby	
•	Taylor	
•	Ella	
•	Halle	
•	Sophie	
	Dallin	
•	Rachel	
•	Ian	

7. Nelson Cabin







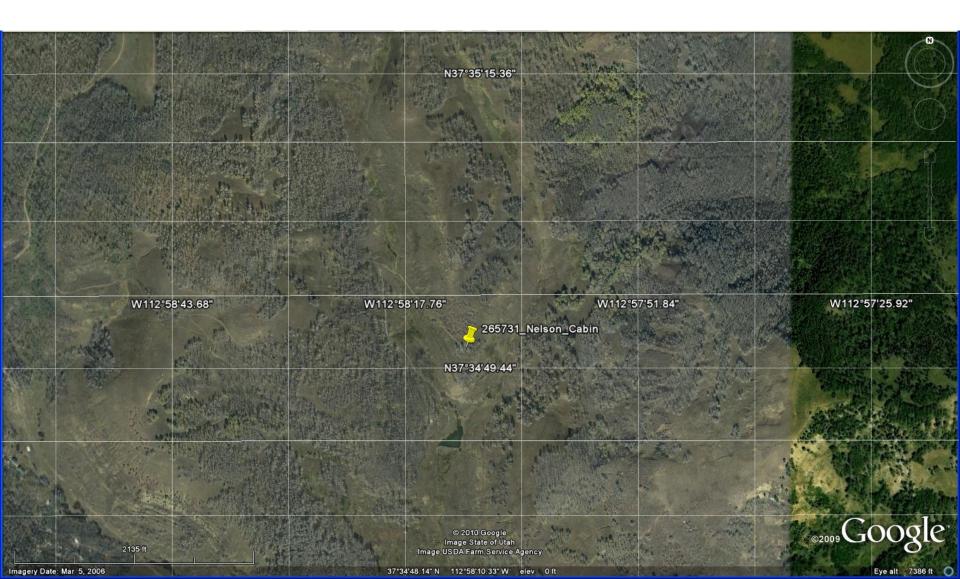




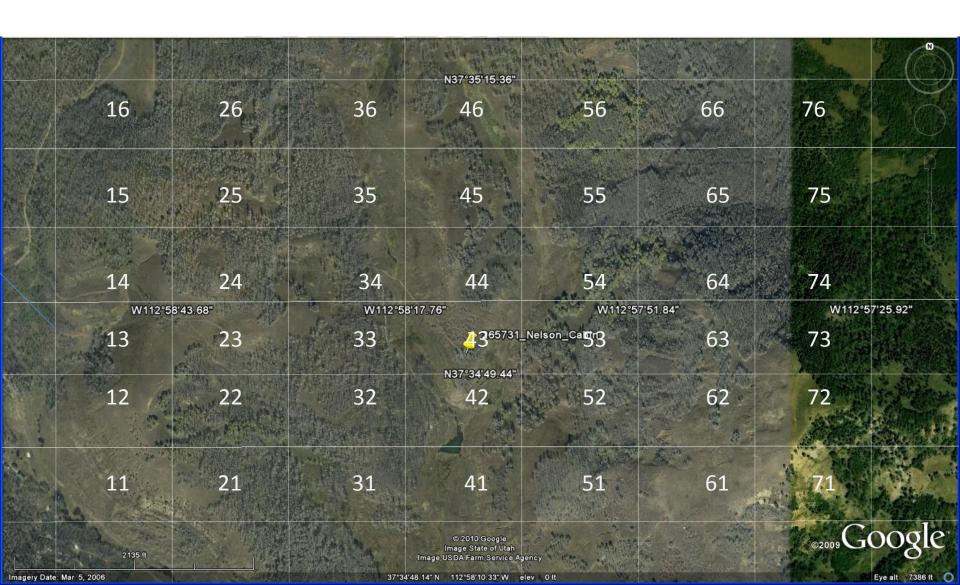




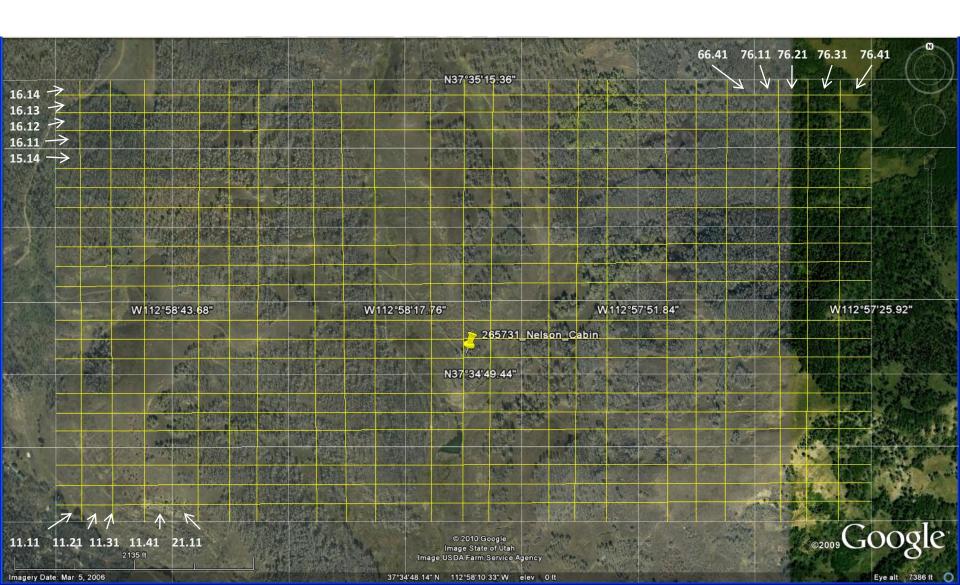
Nelson Cabin Map



Reference Grid



More Detail Reference Grid



Find Quarter Section Corners at Cabin CLARKS LIVESTOCK CLARKS LIVESTOCK TED NELSON TED NELSON GATE TED NELSON CLARKS & TED NELSON NELSON BROTHERS HUNTER NELSON FAMILY HUNTER NELSON FAMOU

Notes

Day 2: Thursday, 07 July 2016

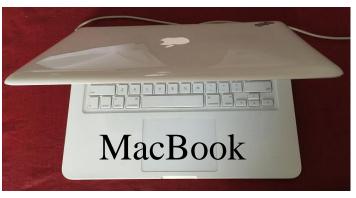
- 1. Hardware
- 2. Media
- 3. Software
- 4. Languages
- 5. Lego Robots
- 6. Programming
- 7. Campfire Singing
- 8. Astronomy

1.a. Slide Rule – An early computer

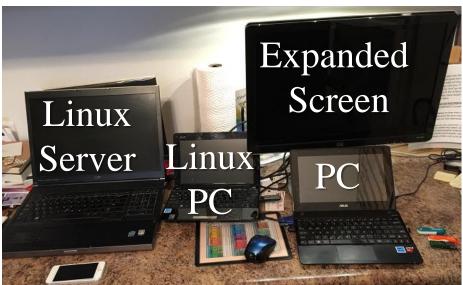


What is being calculated here?









1.b. Hardware:

Equipment, especially computer machine equipment

Computers at Grandpa and Grandma's place





1.c. Other Hardware with Compute Power









1.d. Hardware Becoming More Computerized

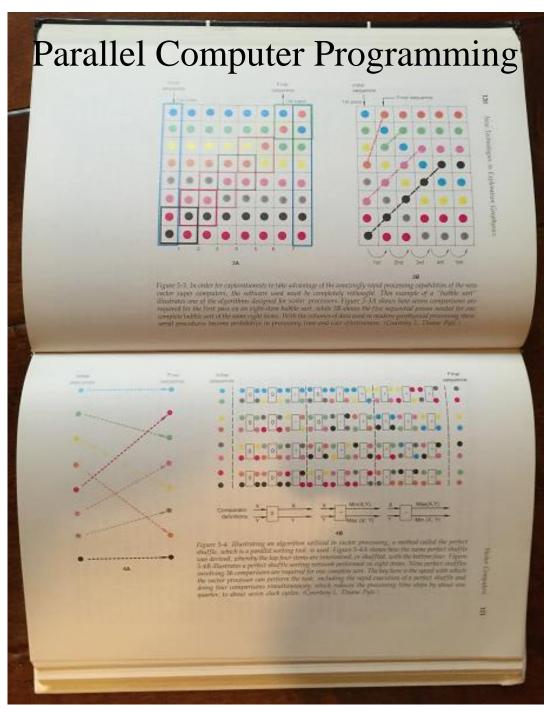












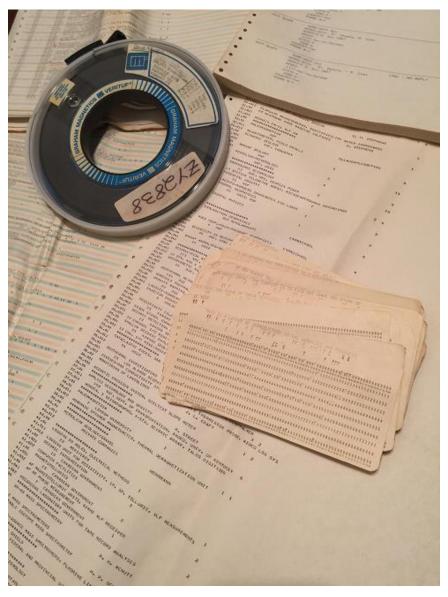
1.e. Clusters & Parallel Computers



Cray Computer

Notes

2.a. Media Input and Output



- 1. Punch Cards
- 2. 9-Track Tapes
- 3. Printouts

Never, never, never point a gun or a bow at another person.



2.b. Media













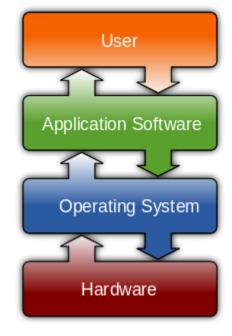
3. Software

Computer software, or simply software, is that part of a computer system that consists of encoded information or computer instructions, in contrast to the physical hardware from which the system is built. The term is roughly synonymous with computer program.

The term "software" was first proposed by Alan Turing and used in this sense by John W. Tukey in 1957. In computer science and software engineering, computer software is all information processed by computer systems, programs and data. Computer software includes computer programs, libraries and related non-executable data, such as online documentation or digital media. Computer hardware and software require each other and neither can be realistically used on its own.

At the lowest level, executable code consists of machine language instructions specific to an individual processor—typically a central processing unit (CPU). A machine language consists of groups of binary values signifying processor instructions that change the state of the computer from its preceding state. For example, an instruction may change the value stored in a particular storage location in the computer—an effect that is not directly observable to the user. An instruction may also (indirectly) cause something to appear on a display of the computer system—a state change which should be visible to the user. The processor carries out the instructions in the order they are provided, unless it is instructed to "jump" to a different instruction, or interrupted.

The majority of software is written in high-level programming languages that are easier and more efficient for programmers, meaning closer to a natural language.[1] High-level languages are translated into machine language using a compiler or an interpreter or a combination of the two. Software may also be written in a low-level assembly language, essentially, a vaguely mnemonic representation of a machine language using a natural language alphabet, which is translated into machine language using an assembler.



A diagram showing how the <u>user</u>interacts with <u>application software</u> on a typical <u>desktop computer</u>. The application software layer interfaces with the <u>operating system</u>, which in turn communicates with the <u>hardware</u>. The arrows indicate information flow.

Notes

4.a. Languages

- **1. Java**: a class-based, object-oriented programming language developed by Sun Microsystems in the 1990s. Java is designed to work across multiple software platforms, meaning a program written on Mac OS X, for example, could also run on Windows.
- **2. C**: A general-purpose, imperative programming language developed in the early '70s, C is the oldest and most widely used language, providing the building blocks for other popular languages, such as C#, Java, JavaScript and Python.
- **3.** C++: an intermediate-level language with object-oriented programming features, originally designed to enhance the C language. It's used to develop systems software, application software, high-performance server and client applications and video games.
- **4.** C#: Pronounced "C-sharp," C# is a multi-paradigm language developed by Microsoft as part of its .NET initiative. Combining principles from C and C++, C# is a general-purpose language used to develop software for Microsoft and Windows platforms.
- **Objective-C**: Objective-C is a general-purpose, object-oriented programming language used by the Apple operating system. It powers Apple's OS X and iOS, as well as its APIs, and can be used to create iPhone apps, which has generated a huge demand for this once-outmoded programming language.
- **6. PHP:** (Hypertext Processor) is a free, server-side scripting language designed for dynamic websites and app development. It can be directly embedded into an HTML source document rather than an external file, which has made it a popular programming language for web developers.

4.b. Languages

- 7. **Python**: a high-level, server-side scripting language for websites and mobile apps. It's considered a fairly easy language for beginners due to its readability and compact syntax, meaning developers can use fewer lines of code to express a concept than they would in other languages.
- **8. Ruby**: A dynamic, object-oriented scripting language for developing websites and mobile apps, Ruby was designed to be simple and easy to write.
- **9. JavaScript**: a client and server-side scripting language developed by <u>Netscape</u> that derives much of its syntax from C. It can be used across multiple web browsers and is considered essential for developing interactive or animated web functions. It is also used in game development and writing desktop applications.
- **10. SQL**: Structured Query Language (SQL) is a special-purpose language for managing data in relational database management systems. It is most commonly used for its "Query" function, which searches informational databases. SQL was standardized by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO) in the 1980s.
- 11. HTML and XML: HyperText Mark-Up and Extended Markup Languages used to write web pages and database interfaces.
- 12. Perl, sed, & awk: scripting languages used to replace Fortran, or Binary Code.





4. Lego Robots



6. Programming

- We will have several computers.
- Your assignment is to
 - Determine something you want software to do.
 - Build a work flow describing:
 - Input;
 - Process; and
 - Output
 - Select a language to write your program in.
 - Write the software.
 - Demonstrate the results to Science Camp attendees.
- This is something you can expand on between now and Science Camp in 2017, and bring the results and show them to everyone next year.

Notes

374 To Me, My Farm Is

6. Campfire Singing

6.

Words by Emma Lambson Nelson, music by Leonard Cohen, arranged by HRN 18 May 2015 written on my i-Pad

0 Fret Strum Bb Gm Bb Gm Bb Gm My farm to me is not just land 1. Gm Rh Where bare, unpainted buildings stand Eb Bh To me my farm is nothing less Bb Gm Bb Gm Eb Than all created loveliness Gm 2. My farm is not where I must soil Bh Gm My hands in endless, dreary toil, Rh But where, through seed and swelling pod Bb Gm Bb Gm Eb I've learned to walk and talk with God Gm 3. My farm to me is not a place Bb Gm Outmoded by a modern race, Eb F Bh I like to think I just see less Eb Of evil, greed, and selfishness. Bb Eb Gm Hallelujah, Hallelujah Eb

Bb F Bb Gm Bb Gm Hallelujah, Hallelu jah

Gm Bb 4. My farm's not lonely, for all day Bh Gm I hear my children shout and play, Eb Bh And here, when age comes, free from fears Eb Bb Gm Bb Gm I'll live again, long joyous years. Bb Gm My farm's a heaven - here dwells rest, 5. Bb Gm Security and happiness,

> Eb Bh Whate'er befalls the world outside Eb Bb Gm Bb Gm Here faith and hope and love abide. Gm Bh

And so my farm is not just land Gm Bh Where bare, unpainted buildings stand, Eb F Bb To me my farm is nothing less Eb F Rh Than all God's hoarded loveliness. Bb Eb Gm

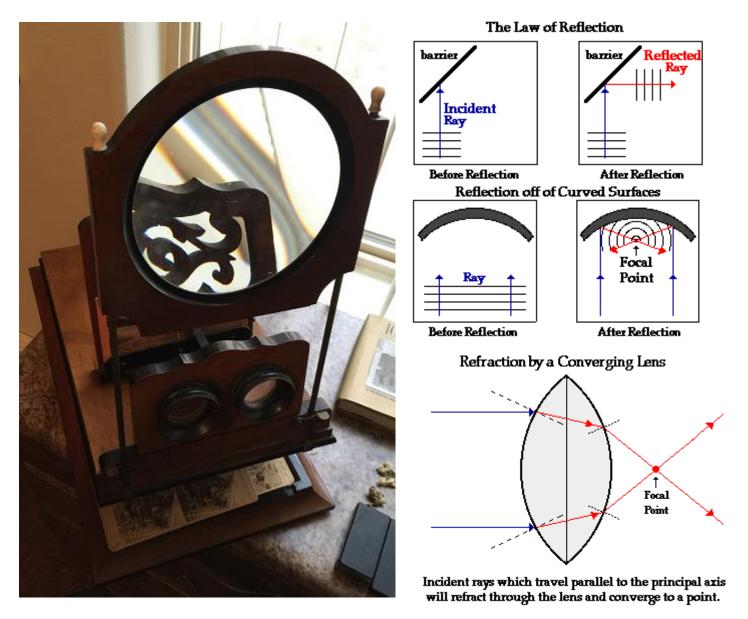
Hallelujah, Hallelujah C: Eb Bb F Bb Hallelujah, Hallelu jah



8. Reflector Telescope (Ray Gardner) and Refractor Telescope (Hilton Long)

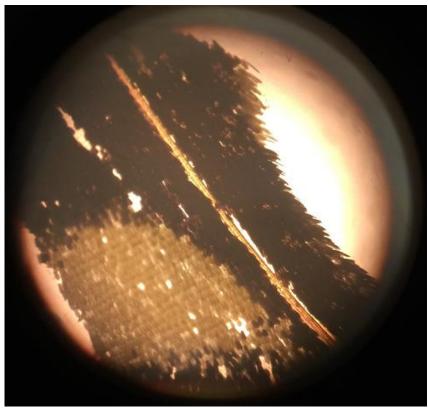


8.a. Reflection and Refraction Lens



8.b. Microscope Reflection & Refraction





8.c. Night Astronomy with Hilton Long & Ray Gardner



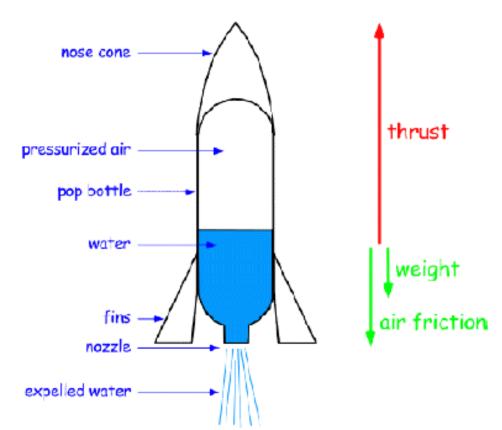
Day 3: Friday, 08 July 2016

- 1. Programming
- 2. Marshmallow Guns
- 3. Races
- 4. Water Rockets
- 5. Revisit Favorite Site:
 - 1. Cascade Falls
 - 2. Mammoth Cave
 - 3. Cedar Breaks
 - 4. Snow Canyon
 - 5. Volcano
- 6. Go to New Site
 - 1. Kanaraville Falls
 - 2. Spring Hill Canyon
 - 3. Taylor Creek
 - 4. Calf Springs Ranch
- 7. Swimming

Water Bottle Rockets

2-Liter Water Bottle Rockets Overview

Great detailed website: http://www.et.byu.edu/~wheeler/benchtop/flight.php



The equation for thrust, caused by water exiting the nozzle, is:

$$T = (P_{in} - P_{out}) \cdot A_n$$

where P_{in}-P_{out} is the difference between pressure within the rocket and atmospheric pressure, and A_n is the cross-sectional area of the nozzle opening. Thrust is dependent on pressure, nozzle diameter. The amount of water dictates how long the thrust force will be applied, and therefore contribute to the rocket's total kinetic energy.

Water Bottle Rockets continued

The following values are the optimal values for maximum height at 90 psi:

- Air/Water ratio = 0.5 liters
- Dry Weight = 220 grams
- Stabilizer Length = 3.5 inches
- Maximum Height = 350 ft (impact pressure = 120 mph baseball pitch)

Water Bottles with thicker plastic (cord strength) can be pressurized greater; many European bottles have much stronger cord strengths than U.S. plastic bottles.

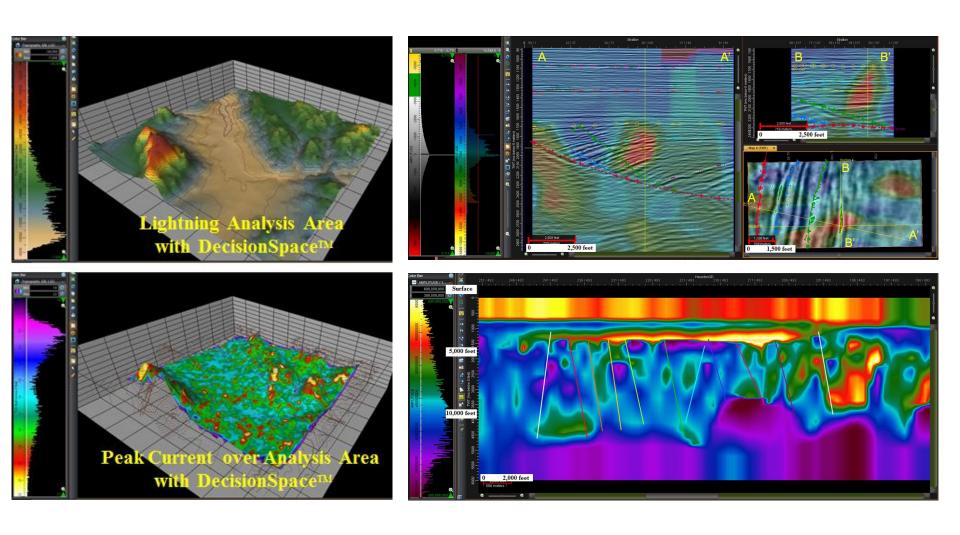
The following mathematical expression yields ~apogee height for a given total flight time:

$$h_{ap} = (g/8)(t_{end})2 - 3.5 \text{ meters}$$

Water rockets, requiring a largish capacity for air and water, are usually large in diameter, this causing a large amount of drag and limiting the height achieved. However, the impulse rating for even a 2 liter water rocket is normally E - four times the impulse of a pyro motor that can be bought over the counter in a high street toy shop.

Motor Impulse Classes		
Impulse /Ns	Class	
I <= 0.625	1/4A	
0.625 < I <= 1.25	½A	
1.25 < I <= 2.5	A	
2.5 < I <= 5	В	
5 < I <= 10	C	
10 < I <= 20	D	
20 < I <= 40	Е	
40 < I <= 80	F	
80 < I <= 160	G	
160 < I <= 320	H	
320 < I <= 640	I	
640 < I <= 1280	J	
1280 < I <= 2560	K	
2560 < I <= 5120	L	
5120 < I	>L	

Status Report on Grandpa's work with Lightning Data



Notes



Day 4: Saturday, 09 July 2016

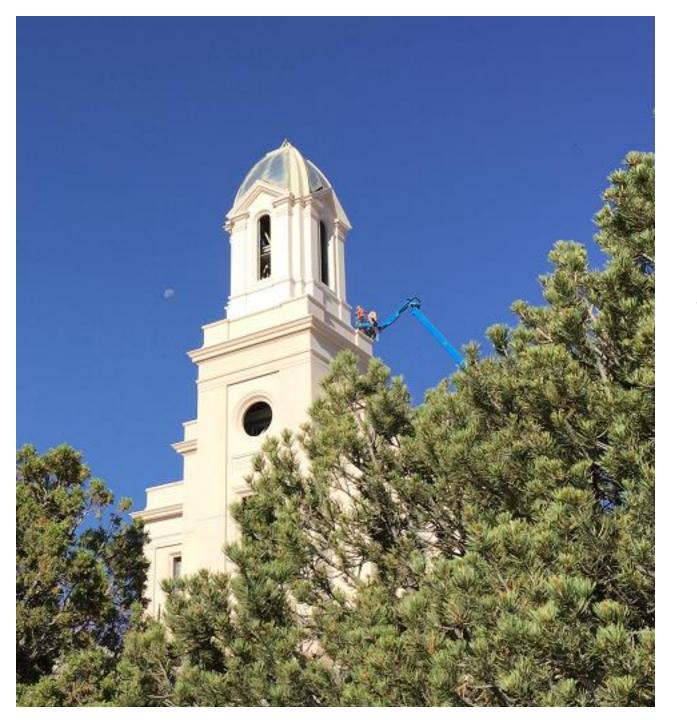


Notes



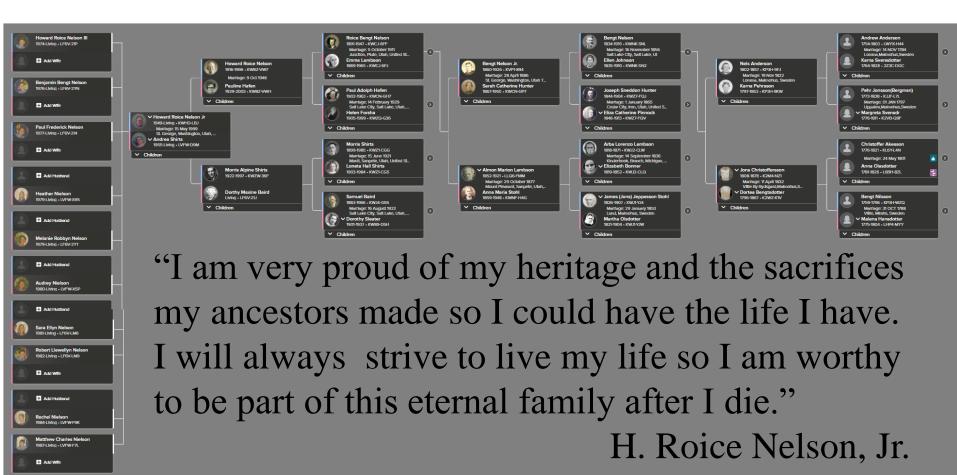
Grandma and Grandpa's Garden
@ Grandma Nelson's Place





Cedar City
Temple
Construction
Progress
28 June 2016

Howard Roice Nelson, Jr.'s Pedigree Chart



Bengt Nelson, Sr. & Ellen Johnson





Bengt Nelson, Jr. & Sarah Catherine Hunter









Cedar City, Iron County, Utah, USA Death: Nov. 11, 1926

Married Sarah Catherine Hunter, 28 Apr 1886, St. George, Washington, Utah Family links:

Bengt Nelson (1834 - 1919)

Elsa Nelson Mendenhall (1889 - 1959)* Roice Benet Nelson (1891 - 1947)*

Henry A. Nelson (1864 - 1864)* *Calculated relationship







Cedar City, Iron County, Utah, USA

Son of Bengt Nelson and Ellen Johnson

Ellen Johnson Nelson (1835 - 1910)

Sarah Catherine Hunter Nelson (1867 - 1950) Children: Sarah Stella Nelson Mendenhall (1887 - 1970)*

Caroline Euphamia Nelson Benson (1895 - 1983) Anna Matilda Nelson Morrill (1898 - 1977)*

Siblings: Bengt Nelson (1860 - 1926) Isaac Andrus Nelson (1871 - 1945)*

Burial: Cedar City Cemetery Cedar City Utah USA Family Search: KVP1-894













Sarah Catherine Hunter Nelson

Cedar City, Iron County, Utah, USA Death: Jan. 11, 1950 Cedar City, Iron County, Utah, USA Daughter of Joseph Sneddon Hunter and Married Bengt Nelson, 28 Apr 1886, St. George, Family links:

Parents: Joseph Sneddon Hunter (1844 - 1904) Eliza Catherine Pinnock Hunter (1846 - 1913)

Bengt Nelson (1860 - 1926)*

Children: Sarah Stella Nelson Mendenhall (1887 - 1970)* Elsa Nelson Mendenhall (1889 - 1959) Caroline Euphamia Nelson Benson (1895 - 1983)* Anna Matilda Nelson Morrill (1898 - 1977)* Siblings:

Joseph Henry Morton Hunter (1865 - 1928)* Sarah Catherine Hunter Nelson (1867 - 1950) William Pinnock Hunter (1869 - 1918)* Euphamia Pinnock Hunter Dotson (1875 - 1938)* Alexander Pinnock Hunter (1887 - 1888)* Calculated relationship

Cedar City Cemetery Plot: A-05-06-04

























Roice Bengt Nelson & Emma Lambson



Roice Bengt Nelson

Utah, USA

Birth: Jun. 24, 1891 Death: Apr. 21, 1947 **Cedar City Iron County**

Utah, USA

Emma Lambson Nelson Birth: Dec. 7, 1890

Sterling **Iron County** Sanpete County

> Utah, USA Death: Mar. 10. 1965. USA

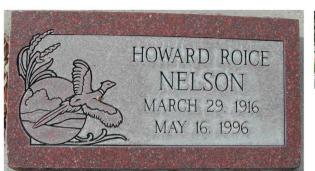
Sarah Ellen Lambson Samuelson (1882 - 1975)* Apolles Lorenzo Lambson (1884 - 1955)* Almon Marion Lambson (1885 - 1908)* Arbie Lambson (1891 - 1892)* Edward Lambson (1893 - 1893)* Gus Lambson (1894 - 1966)*



Dick, Howard, Bud, Ted, Marie, Clara Jean, Shirley, Emma, Beverly, Roice, Luana, Darrell



Howard Roice Nelson, Sr. & Pauline Hafen









Birth: Mar. 29, 1916 Circleville Piute County Utah, USA Death: May 15, 1996 Iron County Utah, USA Family Search: KW8Z-VW7

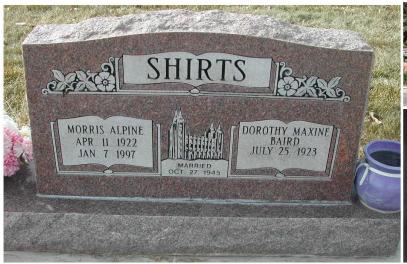








Morris Alpine Shirts







Morris Alpine Shirts

Birth: Apr. 11, 1922 Escalante Garfield County Utah, USA Death: Jan. 7, 1997 Cedar City Iron County Utah, USA

Family Search: KWZW-36F



Notes

2016 Science Camp

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