
WORCESTER POLYTECHNIC INSTITUTE

DESIGN OF SIGNAGE AND INFORMATION SYSTEM

To Protect the Alpine Zone

SUPPLEMENTAL MATERIAL

JONATHAN ASHER

ETHAN CAMPLESE

DANIELLE COOK

BEN PERRIN

WHITE MOUNTAINS PROJECT CENTER, NEW HAMPSHIRE, UNITED STATES

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Appendix A: Authorship Page

Chapter/Section	Primary Author	Primary Editors
Background	-	-
Introduction	Danielle C.	Jonathan A.
Overview of the White Mountains	Danielle C.	Ethan C.
Alpine Zones	Jonathan A.	Danielle C.
Why Alpine Zones Matter	Jonathan A.	Ethan C.
Environmental Damage in the Alpine Zone	Ben P.	Ethan C.
Methods that Aim to Prevent Damage	Ben P.	Danielle C.
Information Systems	Ben P.	Jonathan A.
Signage Systems	Ethan C. Danielle C.	Ben P.
Trail Stewards	Danielle C.	Ben P.
Trail Science	Danielle C. Ben P.	Jonathan A.
Combining Methods to Alter Hiker Behavior	Jonathan A.	Ben P.
Our Project, the WTN, and the USFS	Danielle C. Ben P.	Ethan C.

Appendix A: Authorship Page

Chapter/Section	Primary Author	Primary Editors
Methodology	-	-
01: Investigated threats to the flora within the Alpine Zone of the WMNF	Danielle C.	Jonathan A.
02: Explored existing communication methods and systems	Jonathan A. Danielle C.	Ethan C. Danielle C.
03: Developed approaches to designing a system for environmental protection	Jonathan A.	Danielle C.
04: Produced and evaluated prototype system	All	Jonathan A. Danielle C.
05: Developed final deliverables and recommendations	Danielle C. Ben P.	Jonathan A.
Alpine Zone Signage and Digital Repository System	-	-
Introduction	Jonathan A.	All
Alpine Zone Damage and Combating Methods	Danielle C.	All
The Digital and Physical System	Danielle C. Ben P.	All
Interpretive Signage Computer Aided Design	Ben P.	All
Design of Interpretive Signage Component	Danielle C.	All

Appendix A: Authorship Page

Chapter/Section	Primary Author	Primary Editors
Digital Repository Component	Jonathan A. Ethan C. Danielle C.	All
Recommendations and Final Thoughts	Ben P.	All



Appendix B: Interviewees and Organizations

- Michael Benson - Backcountry Wilderness Manager, United States Forest Service
- Araceli Gonzalez - World Trails Ambassador, World Trails Network
- Nicolette Keown - Lead Visitor Services Information Assistant Scientist, United States Forest Service
- Hailey Lynch - Summit Steward, United States Forest Service
- John Marunowski - Forest Partnership and Volunteer Coordinator, United States Forest Service
- Rebecca Oreskes - Retired, United States Forest Service
- Nancy Ritger - Appalachian Mountain Club
- Nathaniel Scrimshaw - Chair, World Trails Network-Hub for the Americas
- Myles Sornborger - Hydrologic Technician, United States Forest Service

Appendix C: Interview Preamble

We are students from Worcester Polytechnic Institute in Massachusetts working with the World Trails Network Hub for the Americas to investigate the harm hikers cause to trails in the White Mountain National Forest.

We are conducting interviews with trail professionals and would be grateful for your participation. We believe this research will help protect the alpine zone of the WMNF.

This interview should take approximately 45 minutes. Your participation is completely voluntary, and you may withdraw at any time. If you agree, we would like to include some of your responses in our final report which is published on the WPI library database. We will send you our report for approval before finalizing it.

If you have any questions, you may contact our faculty advisor (cdehner@WPI.EDU or stuler@WPI.EDU). If you would like, we are happy to share a copy of our results at the conclusion of the study, by leaving your email address with us. Additionally, you can find the final report at (<https://digital.WPI.EDU/collections/iqp>)

Thank you for your participation!



Appendix D: Interview Questions

- What experiences have led you to your current position with *interviewee's organization*?
- Can you describe what your current position entails?
- What methods have you seen work the best for protecting the alpine zone?
- What are your opinions on current signage used to protect the alpine zone?
 - How could the current signs be improved upon?
- When speaking with people in the backcountry, what kinds of information were they most looking for?
- What kinds of information would you like to see included in interpretive signage and/or digital repository in the alpine zone?
- Would you recommend anybody to speak with for more information?

Appendix E: Survey Preamble

We are students from Worcester Polytechnic Institute in Massachusetts, working with the World Trails Network Hub for the Americas, to investigate the harm hikers cause to trails in the White Mountain National Forest (WMNF).

We are conducting a survey of hikers in the area and would be grateful for your participation. We believe this research will help protect the alpine zone of the WMNF.

The survey should take approximately 5 minutes. Your participation is completely voluntary, and you may withdraw at any time. Your answers will remain anonymous. No names or identifying information will appear in the questionnaire, project report, or publications.

If you have any questions, you may contact us (gr-A23.AlpineZone@WPI.EDU) and our faculty advisors (cdehner@WPI.EDU or stuler@WPI.EDU). If you would like, we are happy to share a copy of our results at the conclusion of the study, by leaving your email address with us. Additionally, you can find the final report at <https://digital.WPI.EDU/collections/iqp>). Thank you for your participation!



Appendix F: Cohort Hiking Survey Questions

This survey was created for individuals in the WPI cohort.

1. How frequently did you hike prior to IQP?

- a. Weekly (or more than)
- b. Monthly
- c. Every few months
- d. Yearly
- e. Never
- f. Other...

2. How frequently have you been hiking since IQP?

- a. 2-3 times total
- b. 1 or 0 times total
- c. 1-2 times per week
- d. 3+ times per week

3. When hiking...

	Always	Often	Sometimes	Rarely	Never
I read signs presented at trailheads.					
I read signs posted throughout the trail.					
I step or walk off the trail.					

4. Check any acceptable reasons to step or walk off the trail.

- a. To move out of another person's way
- b. To look at a plant or animal
- c. To access an outlook/better view
- d. To find a place to rest
- e. To avoid elements (puddles, rocks, branches)
- f. Other...

5. Think back to your most recent hike. How many of the following did you see? Respond with a number (1, 2, 3, etc.) or a "0" if none.

- a. Guidance signs on the trail____
- b. Signs providing reasons to not step off the trail____



Appendix F: Cohort Hiking Survey Questions

- c. Trailblazers____
 - d. Creeks____
 - e. Signs about plants____
 - f. Unique plants____
 - g. Signs about animals____
 - h. Unique animals____
6. What kinds of information would you want to see or learn more about while hiking?
7. How could we make signs along trails more noticeable?



Appendix G: Welch-Dickey Survey Questions

This survey was created for members of the WPI cohort who hiked to the Welch-Dickey Outlook with our project group.

1. What do you remember specifically about the signage while hiking to the Welch-Dickey outlook?
2. What kinds of information would you want to see or learn about at the outlook of Welch-Dickey?
3. How could we make signs at the Welch-Dickey outlook more noticeable?



Appendix H: Compiled Findings

This table is how we organized our findings. The first row is what we learned, while the first column is the resource through which we found that.

		FINDINGS							
		Hikers step off the trail because of trail design, ease of passage, recklessness, and lack of awareness	Education, including backcountry stewards, is one of the most influential methods for keeping hikers on the trail	Sign placement should include locations where people are likely to stop	Alpine zone signage is more likely to be read by visitors if it contains strong imagery, color, and limited text	When signage contains unique and memorable facts specific to the alpine zone, people are more likely to remember the message and stay on the trail	Signage that provides users with information they want/need attracts them to the sign	People hiking in the backcountry are often looking for direction and weather information	People who visit Franconia Ridge speak many different languages.
S U P P O R T E D B Y	Interviews:								
	Hailey Lynch	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Myles Sornborger	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Nikki Keown	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Mike Benson	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	John Marunowski	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Nancy Ritger	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Araceli González	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rebecca Oreskes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other:								
	Cohort Participant observation of hike to Welch-Dickey Outlook	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Existing Resource analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Cohort Survey from hike to Welch-Dickey outlook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Cohort Survey about signage and hiking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Direct observations from Franconia Ridge Loop hike	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Direct observation of hikers at Welch-Dickey Outlook	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Appendix I: Observation Table from Welch-Dickey

This table organized our visitor observation from Welch-Dickey outlook.

- People Count: Number of people per group
- Pet?: Does the group have a pet?
- If Pet, Leash?: Does the pet within the group have a leash?
- Read Sign?: Did the group read the present signage?
- Linger?: How long did the group linger at the outlook?
- Gender?: Are the visitors male or female?
- Prepared?: Are the visitors prepared?
- Off-trail?: Did the visitors step off trail (including their pets)?

Symbol legend:

- D: Dog
- Y: Yes
- N: No
- M: Male
- F: Female

People Count	Pet?	If Pet, Leash?	Read Sign?	Linger?	Gender	Prepared?	Off-Trail?	Notes
1	1-D	Y	N		M	Y	N	
1	1-D	N	N		M	Y	N	LNT
2	N	N	N		M,F	Y	N	
1	N	N	N		M	N	N	Trail runners
1	1-D	Y	N		F	Y	N	
1	N	N	Y	30s	M	Y	N	
1	N	N	Y	15s	F	Y	N	
5	N	N	Y	15s	3F,2M	N	N	One guide, one wanted to go off-trail but was informed by "guide"
1	2-D	1Y,1N	N		F	Y	N	
1	N	N	N		M	Y	N	
1	1-D	N	N		M	Y	N (dog briefly)	
1	N	N	Y	15s	M	Y	N	
2	N	N	N		M,F	N	N	Trail runners
4	1-D	N	N		2M,2F (2kids)	Y	N	Adult(F) reminded to stay on trail
2	N	N	N		2F	Y	N	
2	N	N	Y	15s	M,F	N	N	
2	N	N	Y	15s	2F	Y	N	
17	N	N	Y (1)	10s	1M	25%Y,75%N	Y(3)	Wedding party, 3 were afraid of slipping
2	N	N	N		2F	Y	N	
3	N	N	N		3F	Y	N	
4	N	N	N		4F	Y	N	
2	N	N	N		M,F	N	N	
3	N	N	N		3M	N	N	
1	N	N	N		M	N	N	
1	1-D	Y(only at sub-alpine)	Y	3-5mins	M,F	Y	N	Reminded company to stay on trail, M did not realize at first and stuck to rock to avoid vegetation.
1	N	N	N		M	Y	N	
2	N	N	N		2F	Y	N	
1	N	N	N		M	Y	N	
3	N	N	N		3M	N(2)	N	
2	N	N	N		M,F	Y	N	
1	2-D	1Y,1N	N		F	Y	N	
1	N	N	N		M	N	N	
2	N	N	Y	15s	2F	Y	Y	Walked carefully off-trail to avoid slipping (note it was visually slippery, but not)
75								** main reason people walked off trail was because a rock was wet and looked slippery

Appendix J: Interview Data Chart

This table summarized our findings through our interviews, where the first row is our interviewees, and the first column is the topic we asked about.

	Nikki	Myles	Mike	John	Araceli	Nancy	Hailey	Rebecca
Information Hikers Wanted	- Weather Information - what her task was working - small talk - *some* were interested in plants	- How far to <place>	- How far to <place> - Weather - Camping - Signage confusion	- weather - travel info (How much further)	N/A	N/A	- Low word count - French	- Some people like to talk to rangers, some do not - Few negative encounters - Some people are frightened? - No one hiker profile
State of Signage	- good intentions thus far	- Messaging is decent - Font is too small	- Too wordy	- kiosks were huge improvement	-Kiosks were an improvement, but needs to account for generational changes	does not like signs	- Not great, needs more work	- "Probably important"
Improvements of Signage	- get more people interested in the plants	- Draw attention to ground - How to prevent damage	- Less words more pictures - Specific word choice	- less words/more pictures -	- Visual, grab the expected audience's attention. - Audience changes over generations - Colors, pictures, cartoons, diagrams	N/A	- French - Short and to the point - Welcoming	- As little as possible - Simple and readable maps
Placement of Signage	N/A	- Should be placed before alpine zone not in the alpine zone - Should be where people want to stop	- Depends on needs of the area	- stopping points - before the Alpine Zone: trail heads and along trail	- Stopping points where people have energy - Try to avoid where someone might be exhausted, they'll take a break and not read anything	N/A	- Locations where the hikers are likely to go off trail	- Trailhead - Signs can also attract people to where you do not want them to be
Fines	- passes are effective ways to get people in the visitor center and talking to professionals	- Can deter, but also cause people to act in defiance	- Tickets don't tend to work	N/A	N/A	N/A	N/A	N/A
Corded Fence	- Very Effective; people don't really notice	- Very Effective	- Very Effective	- very effective/huge fan - wish it could be more natural in the landscape	N/A	- effective but takes away from the natural landscape	N/A	N/A
Causes of Hiker Damage	- leaving trail - negligence - not looking down at plants	- Rest/Lunch Places - Confusion - Passing - Trails Converging	- Large quantities of hikers	N/A	- Exhaustion - Resting - Phone usage	lack of education don't know what the right thing is	- Not being aware - High traffic	- Lack of trail management - Hiker traffic
Best Mitigation Method	- closure areas - steward communication - string fencing	- Physical Barriers	- Curb visitor usage (permits, limit people, limit time)	- steward communication and on site communication - blazing	- Communicate when individuals are most susceptible to information	- educate people through stewardship	- Stewards	- Keeping people on trail - Trail maintenance - Wide trails - High of scree walls
languages spoken at Greenleaf						English, French (Quebecois)	french	

Appendix K: Resource Data Chart

This table summarized the main takeaways from the content of the resources we analyzed. The first row is the resource that we analyzed, while the first column are the takeaways.

	AMC Guidebook	Yellowstone National Park App	GMC brochure - The Tundra Walk	Franconia Notch Waterproof TOPO and Visitor Guide	Alltrails (Mount Lafayette and Franconia Ridge Trail Loop-- page)
Source Type	Paper	digital	paper	paper (waterproof)	digital
Types of information provided	<ul style="list-style-type: none"> - History - Usage, wilderness, and scenic areas of the WMNF - Parking fees and hiker shuttles - Appalachian Trail - Climate and Vegetation - Geology - Trip planning, weather, and safety - Storm damage to trails and roads - HikeSafe Hiker Responsibility Code - Following Trails - Lost information - What to carry and wear - Hiking with kids and dogs - Camping Regulations and roadside campgrounds - Fire regulations - Winter considerations - Backcountry hazards - Trail Maintenance - Leave No Trace Principles - Suggested hikes and information about every trail, such as time, distance, and difficulty, nearby housing, and roadside access 	<ul style="list-style-type: none"> - People's Choice - Best Experiences - Intro - History - Geography - Geology - Biology and ecology - flora - fauna - forest fires - climate - recreation - legal jurisdiction - what to see - activities - get in - move around - eat - sleep - safety - tours - hotels - more visitor guides 	<ul style="list-style-type: none"> - alpine protection information - 6 part description of places along the walk - GMC general information - geologic and human history - weather and airborne pollution - plants and animals - description of view of mt. mansfield from 4 cardinal directions 	<ul style="list-style-type: none"> - amc and hut information - National forest and USFS information - history - Driving tour thorough franconia notch - hiking safety - recommended day hikes 	<ul style="list-style-type: none"> - trail length - elevation gain - preview of trail (available with AllTrails+) - weather conditions - recommendations for packing (food, water, clothing) - reviews and photos
Map	<ul style="list-style-type: none"> - Paper maps included for all ranges of the WMNF - Federal Land - State Land - WMNF Wilderness area, and scenic & natural areas - Alpine Zone marked in PINK - 4,000 footers marked with a TRIANGLE - Trails marked with a RED LINE 	allows for download of map for offline access	No	yes, duh	yes, downloadable, and trackable with GPS
Image ratios	No images OTHER THAN the outline of the mountain range at the beginning of each section	~ 2 images per page (honestly should be more to break up the text)	<ul style="list-style-type: none"> - distribution of drawings and images - multiple images per page (good ratio) 	images for all descriptions	- many images
Available in different languages?	No other languages	yes (english, dutch, spanish, french, portugues, russian, mandarin)	No	no	- yes - determined by language of device
Alpine Protection Information (ie stay on trail, keep dogs on leash, etc)	<ul style="list-style-type: none"> - XXIV talks about the climate and vegetation, and has a paragraph dedicated to the alpine zone (above timberline) vegetation - Following trails section from XXVII-XXIX - "Due to fragile vegetation, dogs should be leashed in the alpine zone." (XXXI) 	N/A * not alpine	yes (walk only on rocks, do not pick plants or flowers, leash your dog)	no	no specific alpine information

Appendix L: Shining Rock Midi Sign Content

Appendix L-1: Shining Rock Sign

KEY:

- Important Stop
- Shelter
- Trail
- Interstate
- YOU ARE HERE

Thank you to our many partners who are working to protect the alpine vegetation and make your hike here an unforgettable experience.

Be a steward with us!

Signage System

There are six informational kiosks along the ridge! Each has a QR code that provides more information!

Scan the QR codes!

Map Information Safety Information

Extended Stop Information

Safety First!

Lower leg injuries are the most common hiking injury. Take it slow, take breaks, wear proper footwear, and use trekking poles for stability.

Make sure to stay on the trail and with your group.

6 miles northbound to complete the Franconia Ridge Loop Trail.

2.3 miles southbound from the Falling Waters Trailhead.

Let's Take Care of our Mountains!

- Stay on the trail
- Keep everyone in your group safe (including yourself)
- Leash and clean up after your dog
- Do not disturb and feed the wildlife
- Camping and fire is not allowed in the alpine zone
- Practice "Leave No Trace"

Ecology

MOUNTAIN AVENS **MOUNTAIN CRANBERRY**

Rare plant species, like Mountain Avens and Mountain Cranberry, exclusively inhabit the alpine zone because of its unique climate.

Understand the Trail

- Stay on the trail
- Don't remove rocks from scree walls or cairns.

Help protect the fragile alpine vegetation, so more people can enjoy this wonderful place. Thank you for being a steward of the alpine zone.

Appendix L: Shining Rock Midi Sign Content

Appendix L-2: "Let's Take Care of our Mountains!" Panel

Let's Take Care of our Mountains!








Stay on the trail

Keep everyone in your group safe (including yourself)

Leash and clean up after your dog

Do not disturb and feed the wildlife

Camping and fire is not allowed in the alpine zone

Practice "Leave No Trace"

Appendix L-3: "Ecology" Panel

Ecology





MOUNTAIN AVENS

MOUNTAIN CRANBERRY

Rare plant species, like Mountain Avens and Mountain Cranberry, exclusively inhabit the alpine zone because of its unique climate.

Appendix L-4: "Safety First!" Panel

Safety First!

Lower leg injuries are the most common hiking injury. Take it slow, take breaks, wear proper footwear, and use trekking poles for stability.

Make sure to stay on the trail and with your group.






6 miles northbound to complete the Franconia Ridge Loop Trail.


2.3 miles southbound from the Falling Waters Trailhead.

Appendix L-5: "Signage System" Panel


Signage System

There are six informational kiosks along the ridge!

Each has a QR code that provides more information!



Scan the QR codes!



Map Information

Safety Information

Extended Stop Information

Appendix L: Shining Rock Midi Sign Content

Appendix L-6: "Understanding the Trail" Panel



Understand the Trail

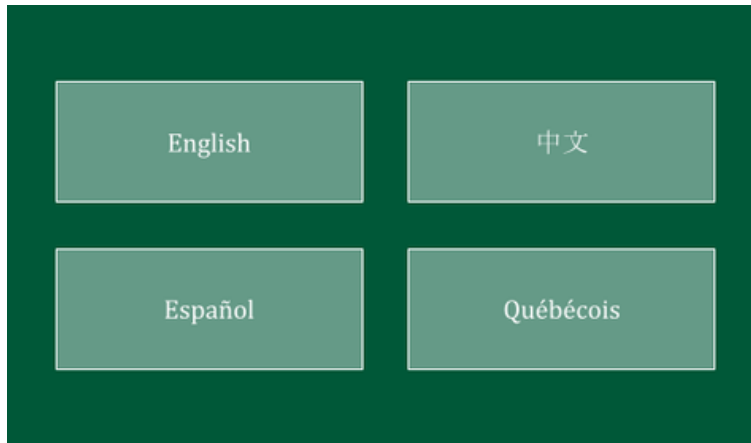


- Stay on the trail
- Don't remove rocks from scree walls or cairns.

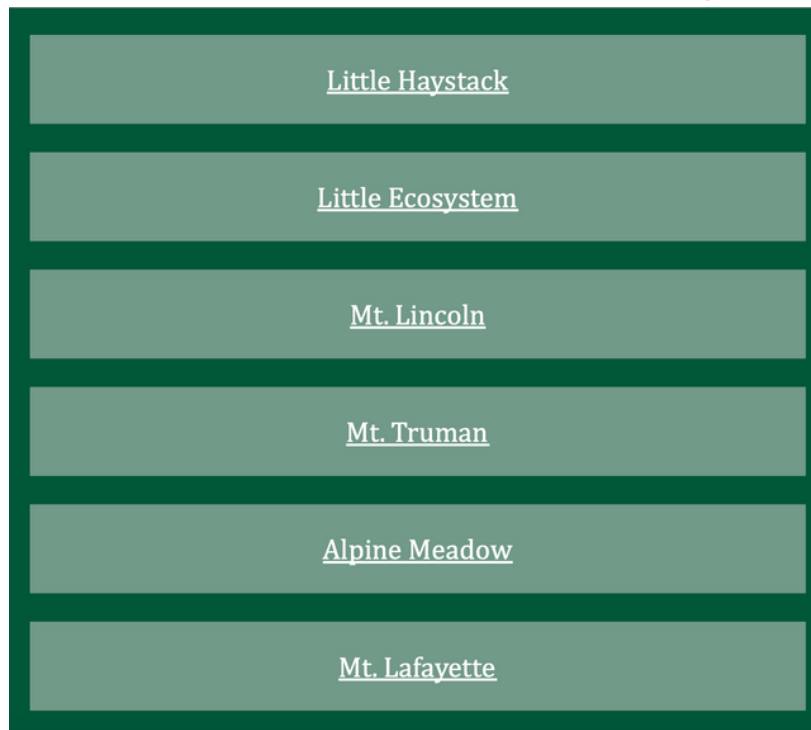
Help protect the fragile alpine vegetation, so more people can enjoy this wonderful place. Thank you for being a steward of the alpine zone.

Appendix M: 6-Stop Digital Pages

Appendix M-1: Language Selection Page



Appendix M-2: Stop Selection Page




Appendix M: 6-Stop Digital Pages

Appendix M-3: Little Haystack Mountain Page

[HOME](#)
[SAFETY](#)
[WEATHER](#)
[MAP](#)




Little Haystack Mountain

You've made it to the alpine zone!



You've just reached the summit of Little Haystack Mountain and entered the precious alpine zone! The alpine zone is unique because of its rocky terrain above the treeline, which makes for harsh weather conditions. This area is home to many rare and fragile plants that are slowly revegetating after being trampled by hikers for many years.

In areas of revegetation, you can see the mountain sandwort growing over areas where trampled diapensia once inhabited. While this plant is vulnerable to damage, it grows back faster than many of the other alpine plants. To protect the mountain sandwort and other species, **please stay on the trail!**



Appendix M-4: Little Ecosystem Page

[HOME](#)
[SAFETY](#)
[WEATHER](#)
[MAP](#)

The Little Ecosystem

Clinging to life



The alpine zone is an ecosystem lined along the top of the ridge, often referred to as biodiverse islands of the sky. It is home to unique plants, like (pictured left and below). Diapensia is called the "cushion plant" because it grows in the shape of a pincushion. It only grows in alpine zones and is recognized as a threatened species.

Diapensia grows very slow, taking **18 years** to produce its first flower. It takes over **100 years** to develop multiple mounds from one plant. These plants are also extremely fragile and die under human footsteps. **Please stay on the trail and help protect this plant!**




Appendix M: 6-Stop Digital Pages

Appendix M-5: Mount Lincoln Page


[HOME](#)
[SAFETY](#)
[WEATHER](#)
[MAP](#)

Mount Lincoln



And the Mountain Cranberry



You just reached the summit of Mount Lincoln! At 5,089 ft in elevation, it is one of New Hampshire's 48 4,000 footers. It is also home to lots of *vaccinium vitis-idaea*, common name Mountain Cranberry (Lingonberry). Mountain cranberry thrives in cold temperatures and high elevations, making the alpine zone a perfect home for it.



Though rare, the mountain cranberry is native to the New England area. It is a trailing shrub that flowers in June-July, and produces white or pink bell shaped flowers. Its leaves are small and shiny from a thick layer of wax. The fruit is an edible, bitter, dark red berry. **Please help protect the alpine plants by staying on the trail!**

Appendix M-6: North Lincoln Page

[HOME](#)
[SAFETY](#)
[WEATHER](#)
[MAP](#)

Truman (North Lincoln)

What are we surrounded by?



To the North, the ridgeline leads up to Mt. Lafayette. It is the highest Point in the Franconia Range at an elevation of 5,249 ft. The Mountain is named in honor of General Gilbert du Motier, Marquis de La Fayette, who aided the Continental Army during the American Revolutionary War.

To the West, Cannon Mountain is distinguishable. It is known for its recreational use among skiers, rock climbers, and hiker. Until it crumbled in 2003, there was a unique formation resembling an old man notoriously referred to as "The Old Man of the Mountain".

To the East, the landscape opens to the Pemigewasset Wilderness. At 45,000 acres large and 60 miles of maintained hiking trails, it is the largest Wilderness on the White Mountains National Forest. Between 1890 and 1940 loggers cleared the forest. The "Pemi" has been revegetated over the last 80 years.

To the South, the trail leads back towards Mt. Lincoln. Lincoln is the middle of the three peaks along the Franconia Ridge. The Ridge is part of the Appalachian Trail, which is 2190+ miles long and spans from Georgia to Maine.




Appendix M: 6-Stop Digital Pages

Appendix M-7: Alpine Meadow Page

[HOME](#)

[SAFETY](#)

[WEATHER](#)

[MAP](#)

The Alpine Meadow: Sedges and Rushes

Holding It Together



Highland Rush (*Oreojuncus trifidus*) is a common plant across the alpine zone. While it may look a lot like a rough grass, with green tufted stems growing up to 40 centimeters, Highland Rush is a delicate alpine plant that cannot be stepped on as if it is a lawn. The roots of Highland Rush help bind the soil together and prevent the erosion of the alpine soil.



Bigelow's Sedge (*Carex bigelowii*) is another grass-like plant in the alpine zone, commonly growing around rocks. Bigelow Sedge, despite looking like long lawn grass, is also a delicate plant in the alpine zone that needs protection. These plants play a crucial role in the alpine ecosystem. **Take care to stay on trail to protect these delicate plants!**



World Trails Network logo and UAS logo.

Appendix M-8: Mount Lafayette Page

[HOME](#)

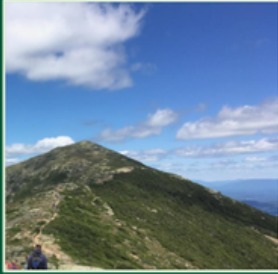
[SAFETY](#)

[WEATHER](#)


[MAP](#)

Mount Lafayette


The tallest peak in the Ridge!



You are at the peak of Mount Lafayette! At 5,249 feet of elevation, this is the tallest peak on Franconia Ridge! This area contains a plentiful amount of Highland Rush and Bigelow Sedge, and is the site of the 1800s summit house ruins!

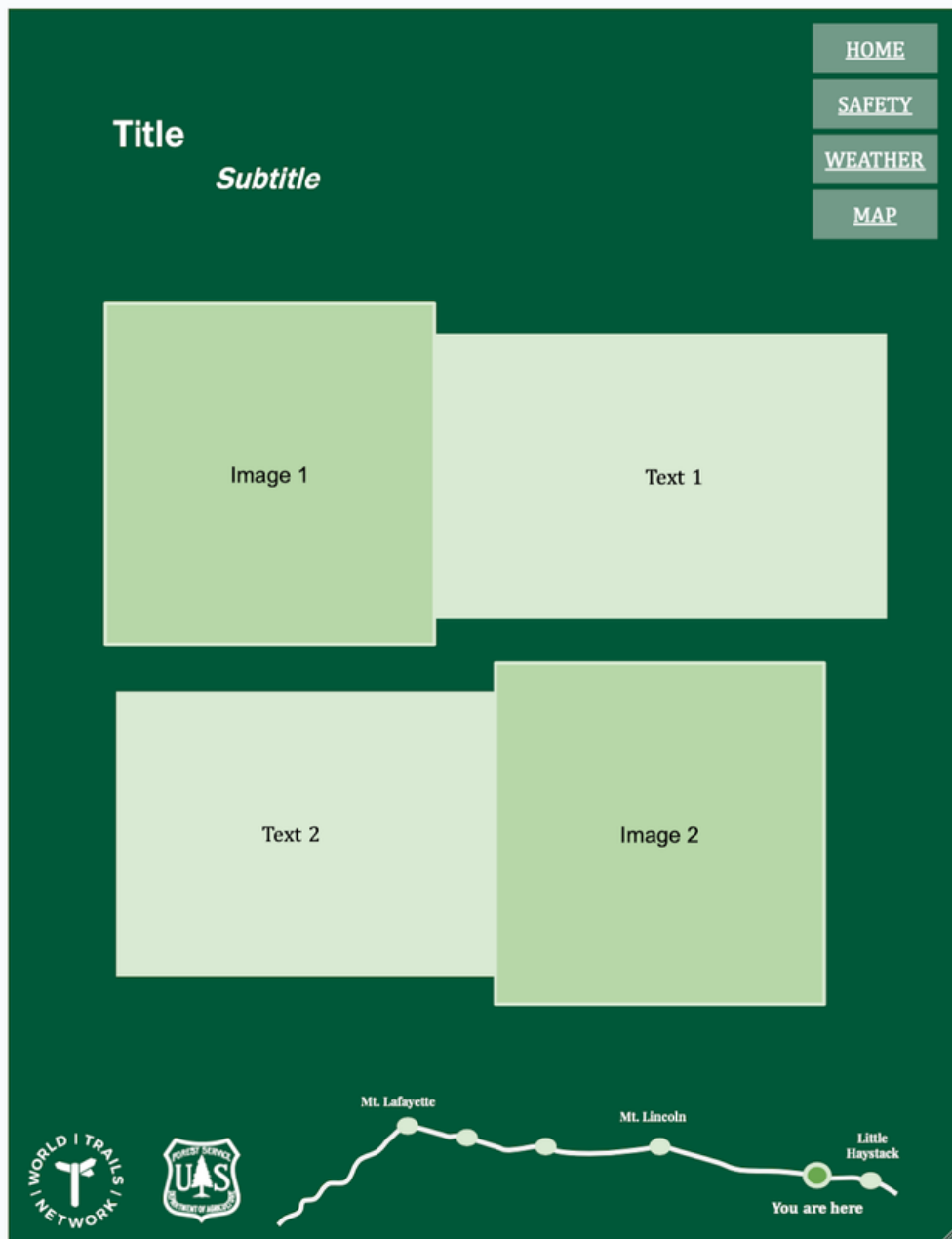


The stone brick foundation is all that remains of the 1800s Mount Lafayette summit house. Once used to shelter horses coming up the mountain, it still remains a great spot to rest and shelter from the high winds that can be present at the top of this mountain.



World Trails Network logo and UAS logo.

Appendix N: Digital Page Template



Template Instructions:

Sign and QR code placed along in decided location.

QR code brings user to landing page, which allow them to choose language.

Selecting language hyperlinks user to the digital page for that sign.

This is the template for digital page.

Appendix O: Physical Sign Template

PLEASE

STAY ON THE TRAIL

Text (short blurb)

Image

THANK YOU!



Appendix P: Physical Sign Designs

Appendix P-1: "Alpine Restoration" Sign

ALPINE RESTORATION

These plants take decades to grow, and die under footsteps in a day.

Please,

- Stay on the trail 
- Keep dogs on leash 
- No camping or fires 

THANK YOU!



Appendix P-2: Little Haystack Mountain Sign

PLEASE

STAY ON THE TRAIL

The plants in this area have been trampled for many years and are regrowing.



The mountain sandwort is reinhabiting the area.

THANK YOU!



Appendix P: Physical Sign Designs

Appendix P-3: Little Ecosystem Sign

PLEASE

DO NOT STEP HERE

These rare and fragile alpine plants have been severely trampled. Some took 50 years to grow and can be killed with a single footstep.



STAY ON THE TRAIL

THANK YOU!



Appendix P-4: Mount Lincoln Sign

PLEASE

STAY ON THE TRAIL

Do your part to protect plants, like the mountain cranberry, that only grow in the alpine zone.



THANK YOU!



Appendix P: Physical Sign Designs

Appendix P-5: North Lincoln Sign



Appendix P-6: Alpine Meadow Sign



Appendix P: Physical Sign Designs

Appendix P-7: Mount Lafayette Sign



Appendix Q: Maps

Appendix Q-1: Shining Rock Map



Appendix Q-2: Little Haystack Mountain Map



Appendix Q-3: Little Ecosystem Map



Appendix Q-4: Mount Lincoln Map

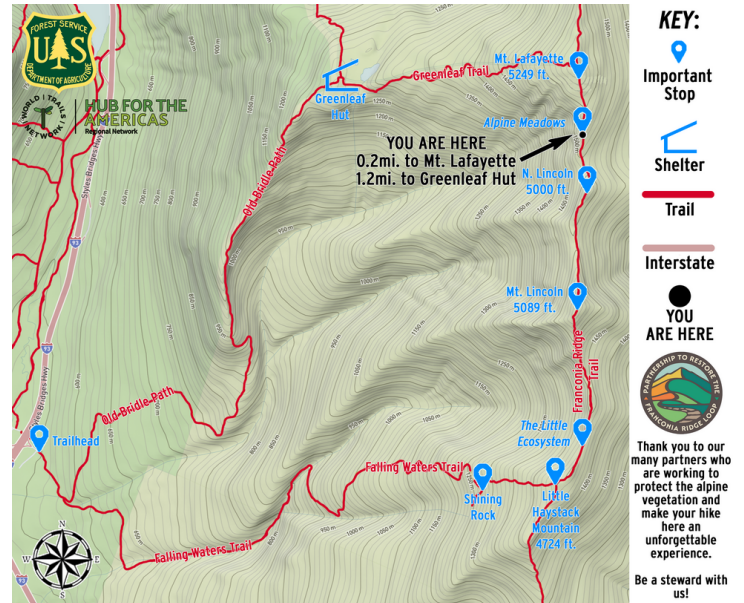


Appendix Q: Maps

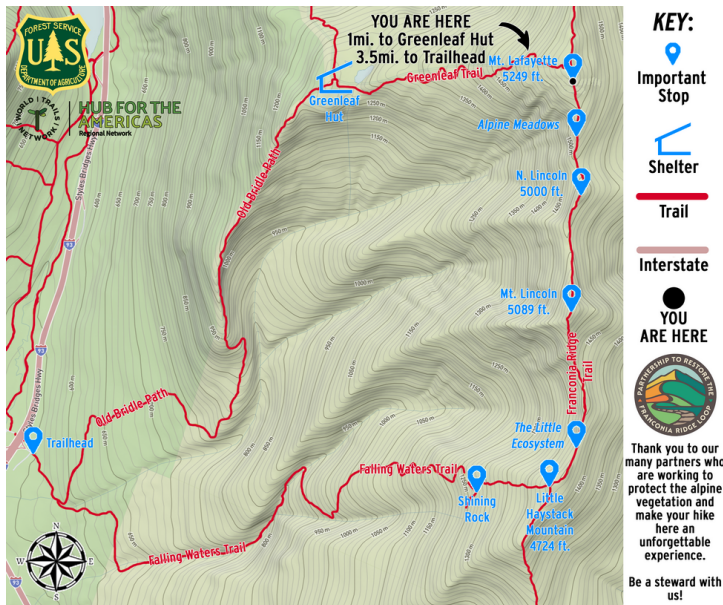
Appendix Q-5: N. Lincoln Map



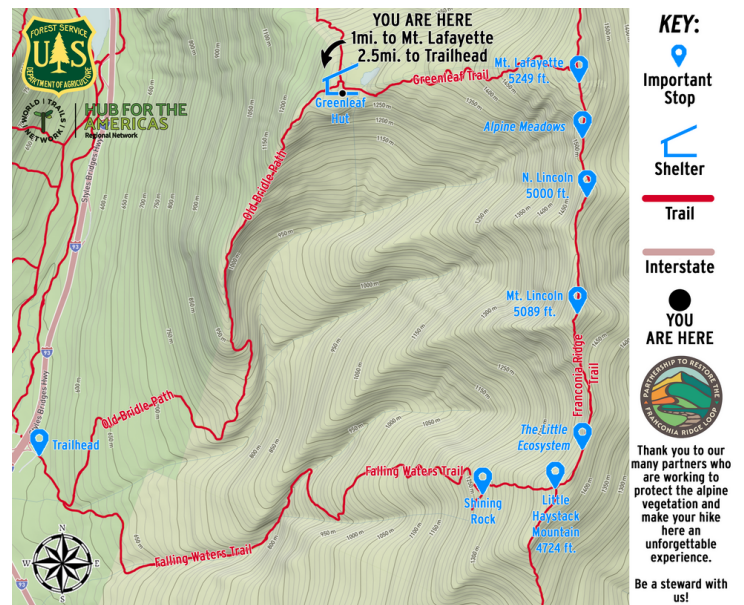
Appendix Q-6: Alpine Meadows Map



Appendix Q-7: Mount Lafayette Map



Appendix Q-8: Proposed Greenleaf Hut Map

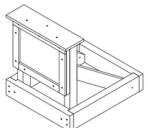


Appendix R: Micro CAD Drawings

NOTES - UNLESS OTHERWISE SPECIFIED

- INTERPRET DRAWING PER ASME Y14.100 DIMENSIONING AND TOLERANCING PER ASME Y14.5
- MATERIAL: SEE PARTS LIST

⚠ DO NOT PREPARE HOLE PRIOR TO ASSEMBLY. HOLE AND TAPER CREATED BY DRILLING HARDWARE THROUGH MATERIAL.
 ⚠ APPLY HIGH-STRENGTH WOOD GLUE PRIOR TO HARDWARE ASSEMBLY.
 ⚠ PERMANENTLY MARK PART SERIAL AND REV. APPROXIMATELY AS SHOWN - UN VTN000000-XX-XX WHERE "X" IS REV. AND "XX" IS INDIVIDUALIZED SERIAL NUMBER STARTING FROM 01. 02. CONTINUED.



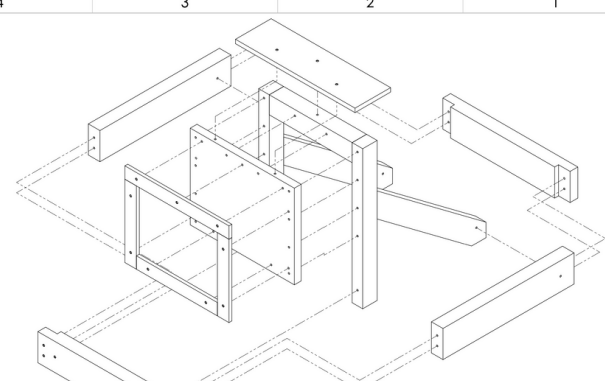
ISOMETRIC VIEW

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
00	INITIAL DESIGN	10/9/2023	

QTY	CAGE CODE	REGD.	IDENTIFYING NO.	PART OR IDENTIFYING NO.	MATERIAL SPECIFICATION	ITEM NO.
24				#9 X 2-1/2" #25 STAR TYPE-17 POINT, PFC	APPX212-1 OR EQV.	1

UNLESS OTHERWISE SPECIFIED DIM ARE IN INCHES		APPROVALS	DATE	SOLE PROPRIETOR
X ± 0.00	XX ± 0.050	ENGINEER	2023-10-10	B. PERRIN
XXX ± 0.15	XXXX ± 0.05	MATERIAL	XXXX-00-00	
ANGLE ± 1°		SEE PARTS LIST		
THIRD ANGLE PROJECTION		FINISH	SIZE	CAGE CODE DWG NO. WTN00000001
DO NOT SCALE DWG		SCALE 1:8	WT LB	REV 00 SHEET 1 OF 11

SOLIDWORKS Educational Product. For Instructional Use Only.

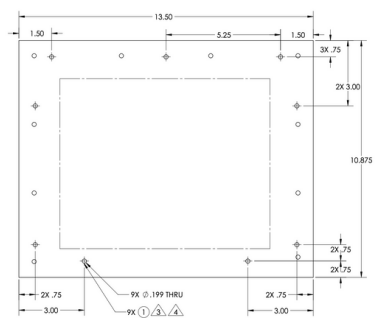


EXPLODED VIEW

SCALE 1:4 | WT LB | SHEET 2 OF 11

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MOUNTING FIXTURE



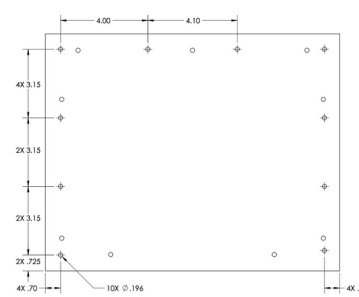
FRONT VIEW

SCALE 1:2 | WT LB | SHEET 3 OF 11

SOLIDWORKS Educational Product. For Instructional Use Only.

MOUNTING FIXTURE

MOUNTING BLOCK HOLES

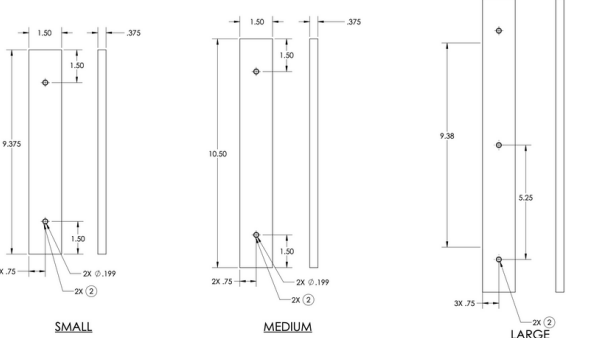


FRONT VIEW

SCALE 1:2 | WT LB | SHEET 4 OF 11

SOLIDWORKS Educational Product. For Instructional Use Only.

MOUNTING BLOCKS

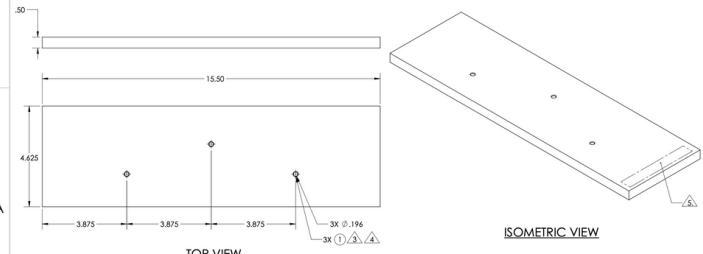


SMALL **MEDIUM** **LARGE**

SCALE 1:2 | WT LB | SHEET 5 OF 11

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SIGN TOP

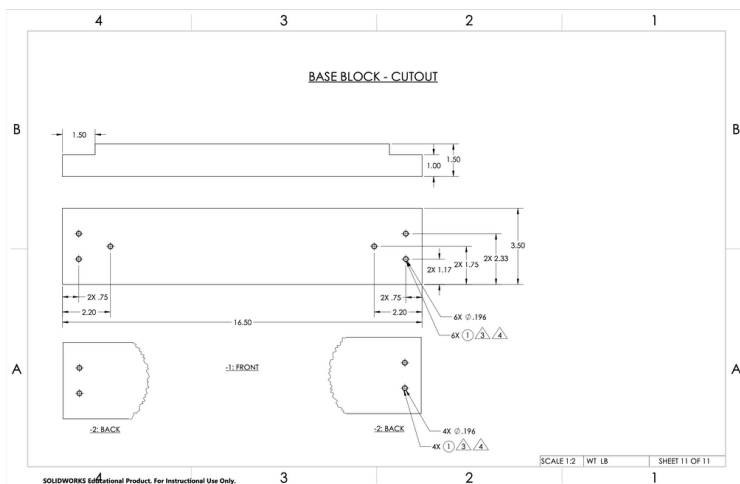
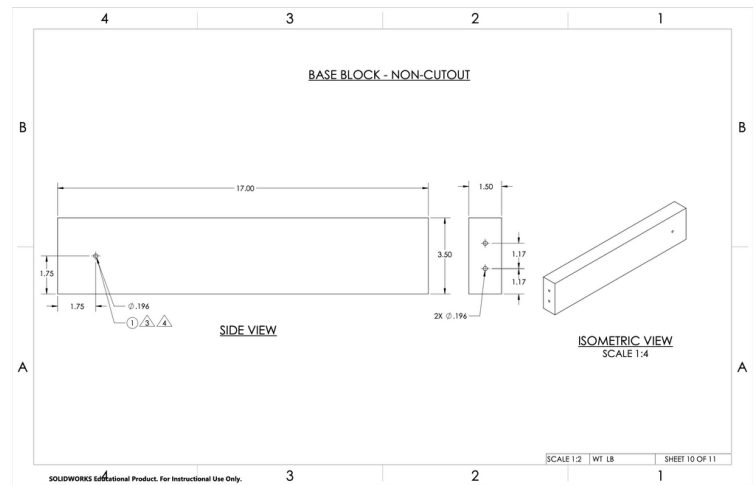
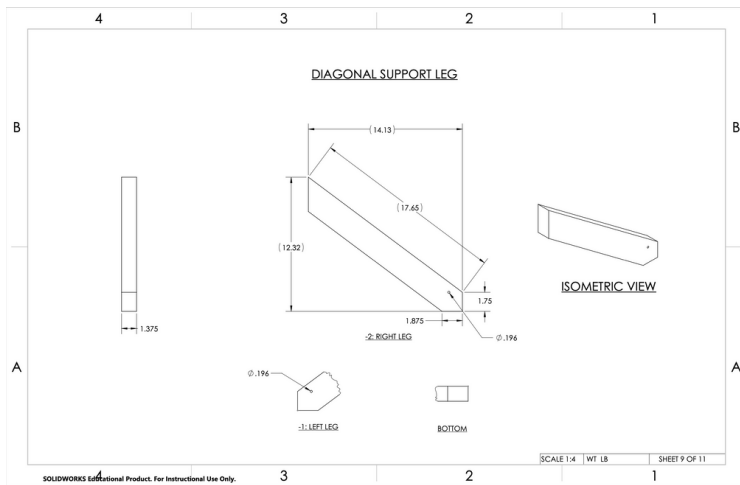
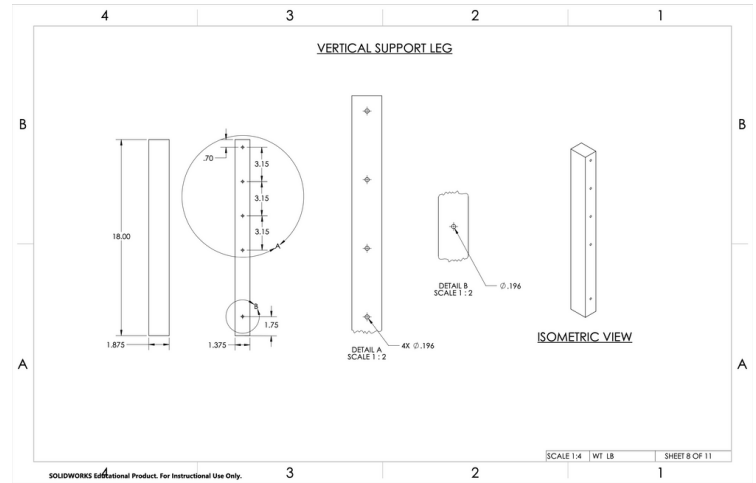
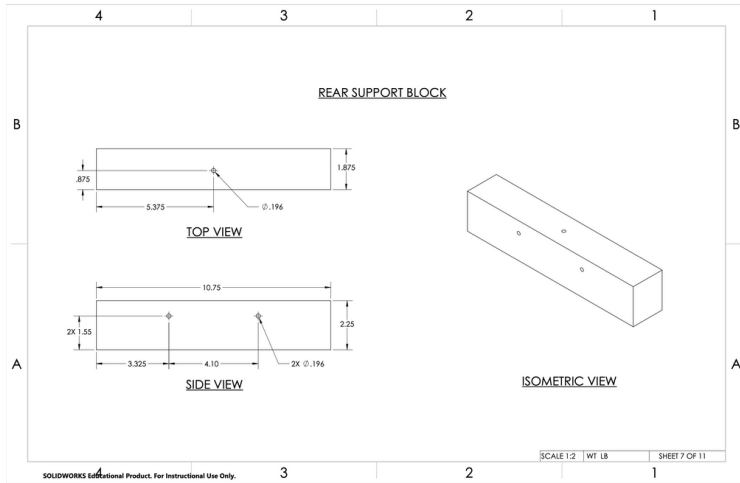


TOP VIEW **ISOMETRIC VIEW**

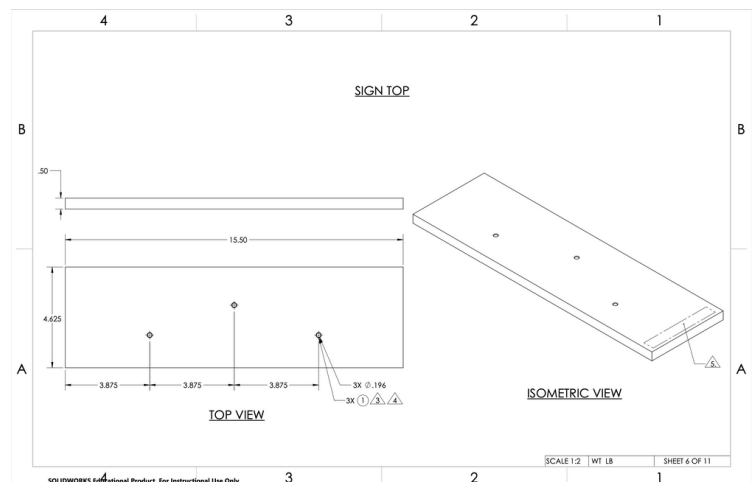
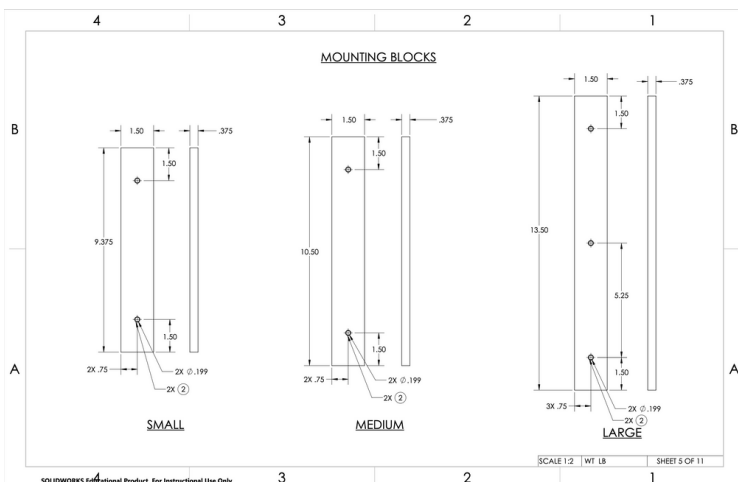
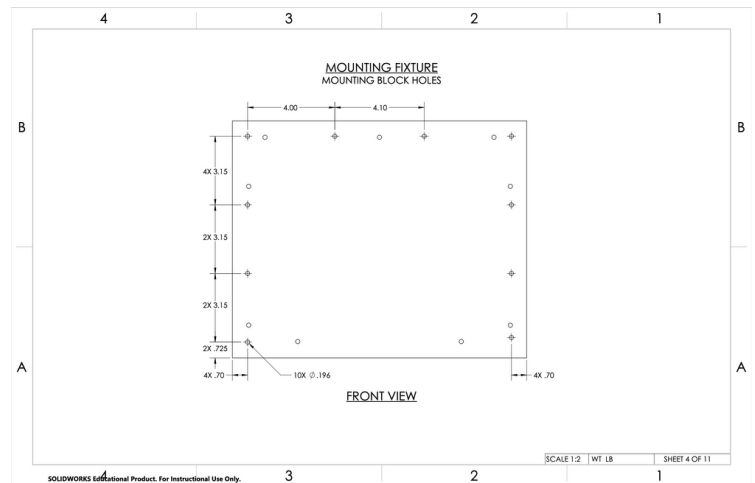
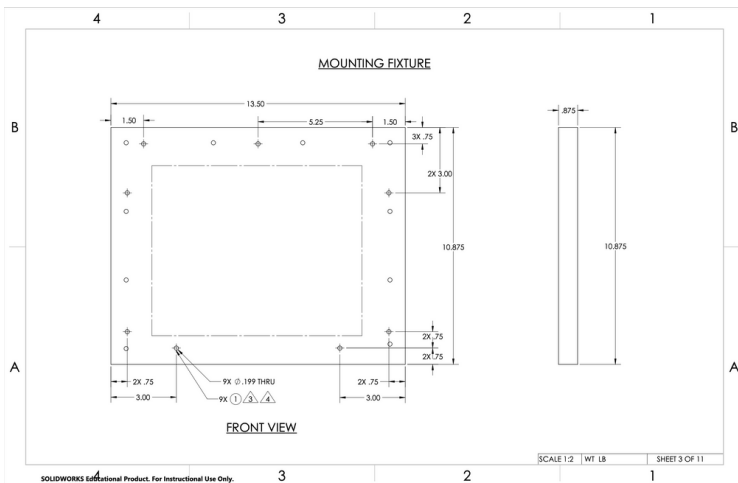
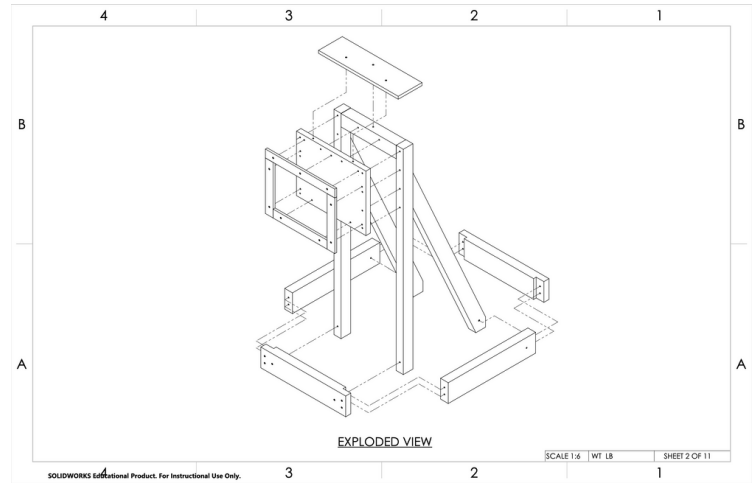
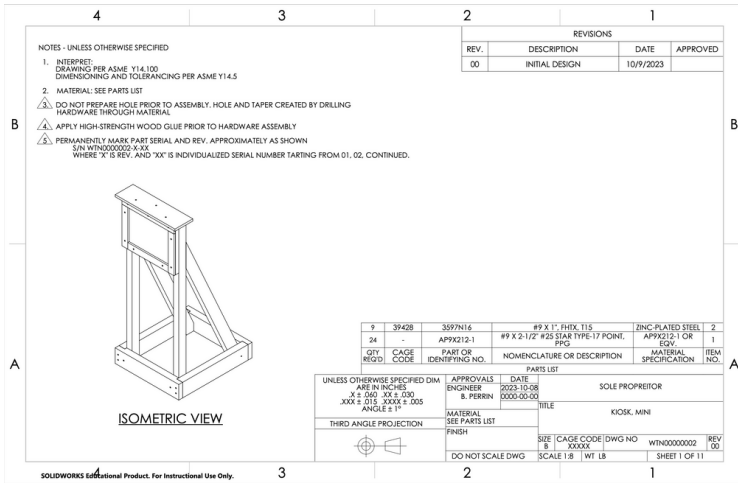
SCALE 1:2 | WT LB | SHEET 6 OF 11

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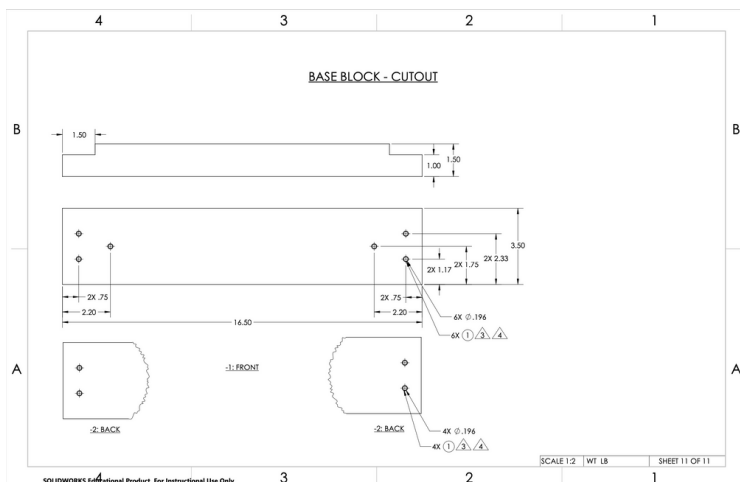
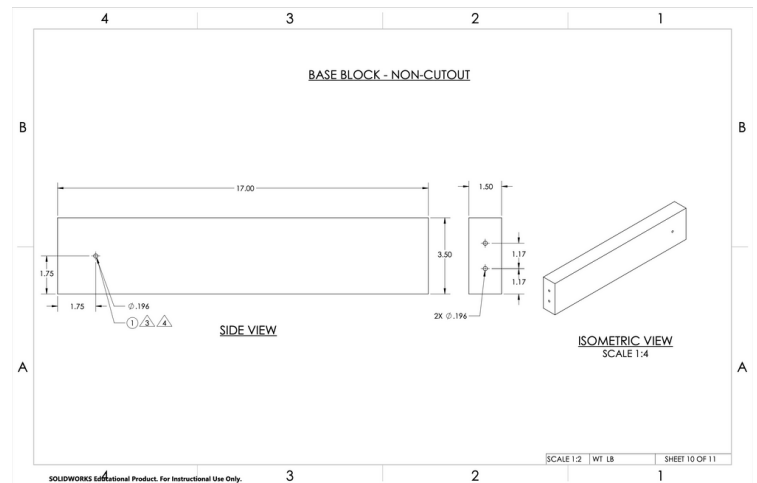
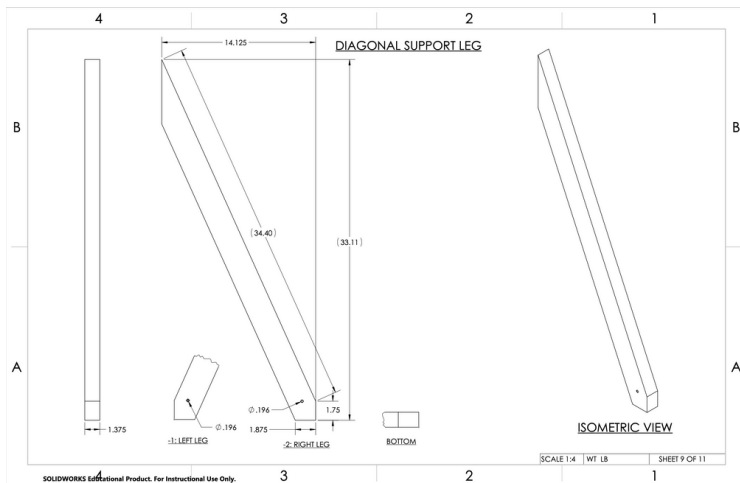
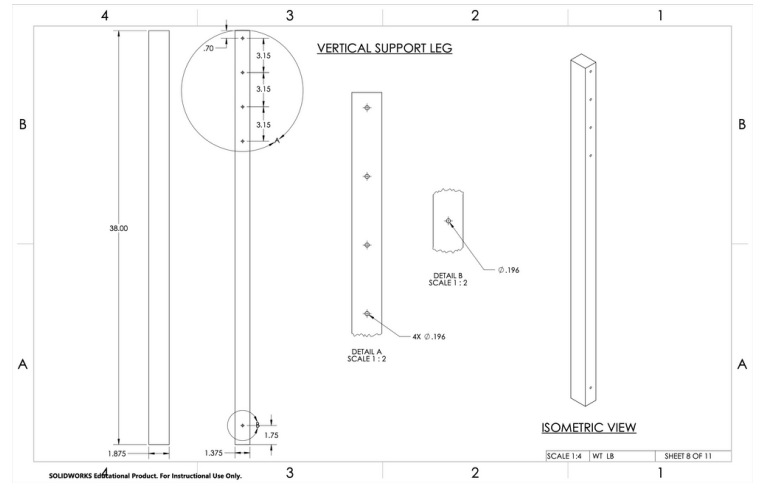
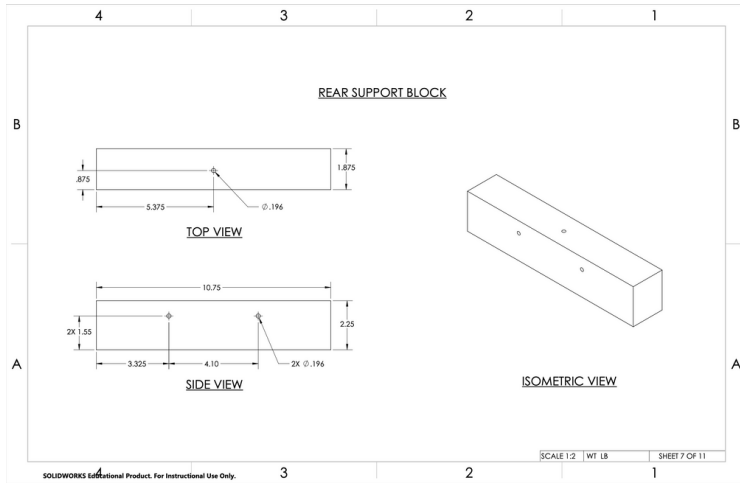
Appendix R: Micro CAD Drawings



Appendix S: Mini CAD Drawings



Appendix S: Mini CAD Drawings



Appendix T: Midi CAD Drawings

