



Lecture #1

Introduction to Rock climbing

Belay and Rappel

Jan Abendroth
January 2nd, 2025

YouTube link of recording:
https://youtu.be/4KnCfF_jwoU



Where are we in the Course?

Lectures: Introduce content

#1: Introduction to Rock (Thursday, January 2nd) - Jan Abendroth

#2: Alpine rock climbing (Tuesday, February 4th)

#3: Snow travel and Crevasse rescue (Thursday, April 3rd)

#4: Glacier travel, trip planning and the climbing party (Tuesday, May 6th)

Field trips: Hands-on introduction to content

Skills nights: Practice sessions on Monday nights



Field trips in January

#1: Top rope belay:

2 weekday nights, PC

Tuesday, 1/14 or Thursday, 1/16

both events are identical, only sign up for one
optional if you know how to use a belay device

#2: Anchors and rappel

2 weekday nights, PC

Tuesday, 1/28 or Friday, 1/31

both events are identical, only sign up for one
optional Field trip

Please sign up.
Please come prepared.
Please be on time.

BADGES
you will
earn:



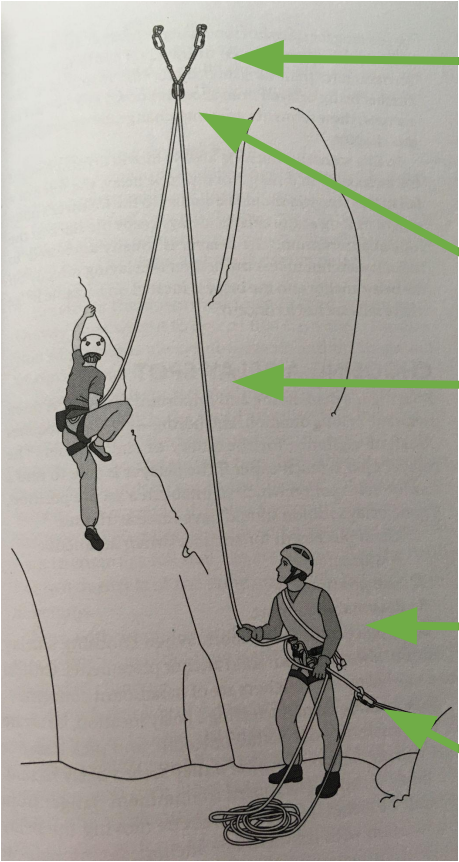
Seattle Basic Alpine Climbing Class 2022 - Curriculum

**Seattle Basic Alpine Climbing Course.
Curriculum Outline for Field Trips 1-7.**

Field trip 1 - Top-rope Belay/Lower, Belay



Top rope belay



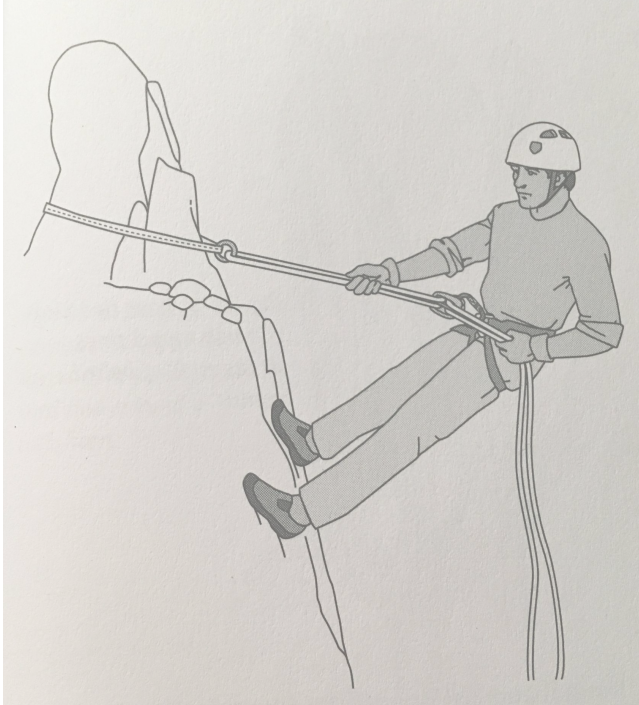
Anchor

Gear strength

Belay

Knots, hitches, bends

Rappel



Knots, hitches and bends

Knots: tied with the rope only, creates an end point. Should not move.
Field trip 1, 2: overhand knot, overhand on a bight, rewoven figure-8,
rest of course: slip knot / mule knot, butterfly knot, bowline (single, double)

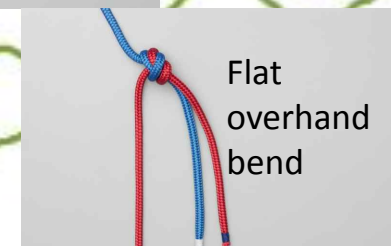
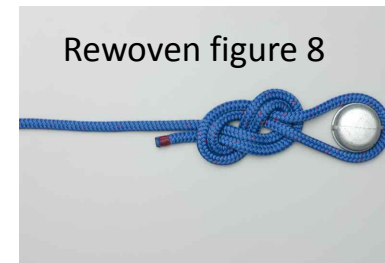
Hitches: connect a rope to another object, such as a carabiner
Field trip 1, 2: clove hitch, girth hitch, munter hitch
rest of course: prusik hitch, klemheist

Bends: tie two ropes together
rest of course: double Fisherman's bend, water knot

More helpful than lecture:

Animated knots: <https://www.animatedknots.com/climbing-knots>

REI knots video: <https://youtu.be/V1yq9XoAbCQ>



Top rope belay



<https://youtu.be/CFIz4cBFVro>

Harness, tie-in, partner check

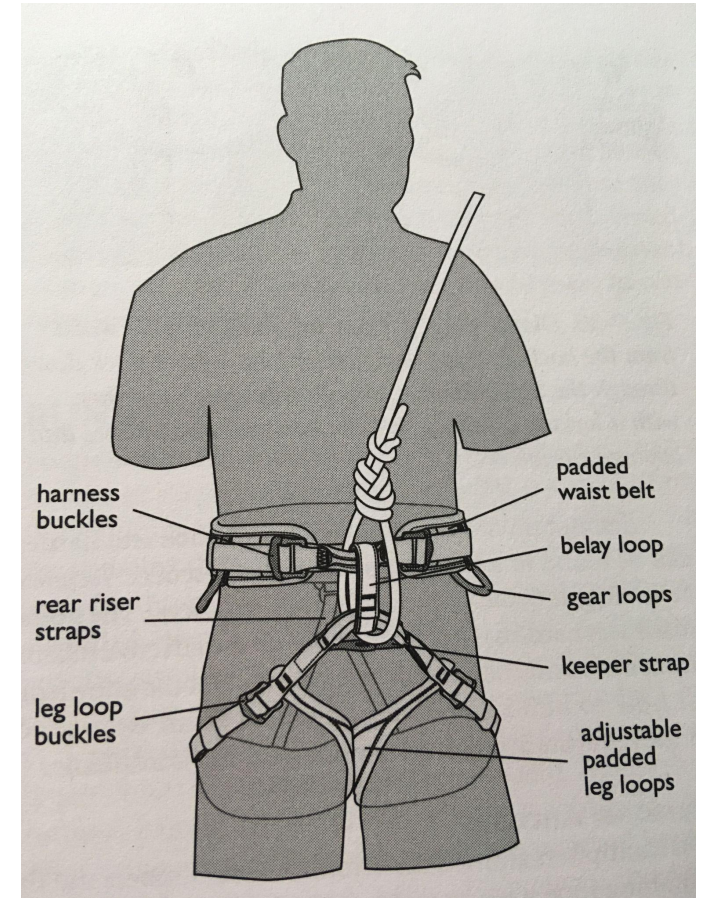
Partner check: done before each climb.

- **Harness:** Snug fit (hands barely fit between harness and yourself) and belt double-backed.
Leg loops tightened (if adjustable)
- **Tie-in:** Climber tied in with rewoven figure-8, well dressed and with 4-6" tail
Single pitch: system closed with stopper knot
Multi pitch: both climbers are tied in
- **Belay:** Belay device properly set up
Carabiners locked

Harness: *

Load bearing: belay loop, waist belt loop

Not load bearing: leg loop, gear loop



*** always check manufacturer's specifications**



Climbing commands

Clear and simple command sequences:

<u>Climber</u>	<u>Belayer</u>
On belay?	Belay on!
Climbing!	Climb on!
Tension!	Got you!
Falling!!	Got you!!
Lower me!	Lowering!
Rappel!	--

Use names in gym or busy crags to avoid confusion.



PBUS (Pull, Brake, Under, Slide)



Pull slack out of the system.
Use guide and brake hand.
Note: System is not in brake position



Brake hand below device.
Device now in brake position.



Move guide hand
below/**under** brake hand
and hold rope.



Slide brake hand towards belay device.
Keep brake hand around the rope.
Keep a few inches distance to belay device.

NEVER take the brake hand off the rope!!



Lowering a climber



Communicate with climber.
Both hands on the rope.



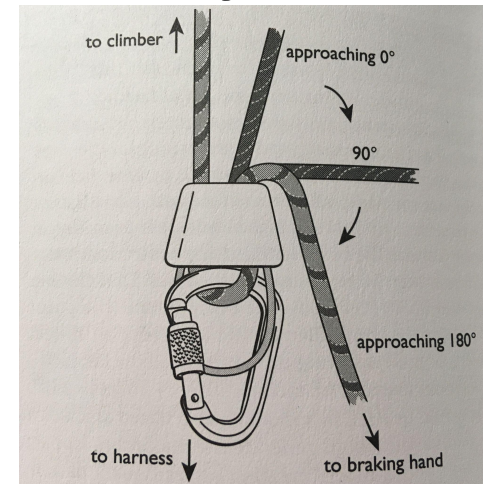
Watch and listen to climber.
Adjust lowering speed as needed.

NEVER take the brake hand off the rope!!



Understanding the tubular belay device

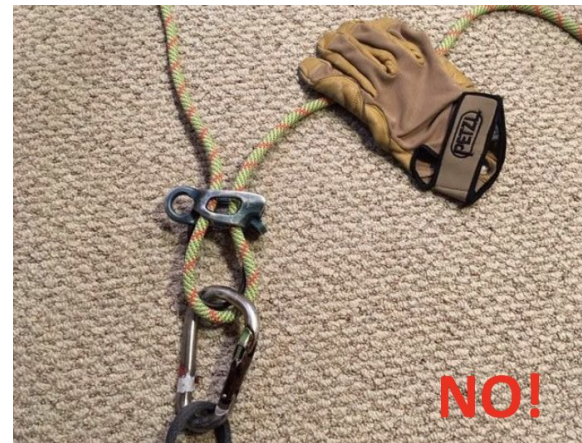
- Belay device, tube style device, or ATC (air traffic control)
- Friction created by bends in the rope.
- Brake hand keeps rope in brake position.
- Never take brake hand off rope!!



BD
ATC

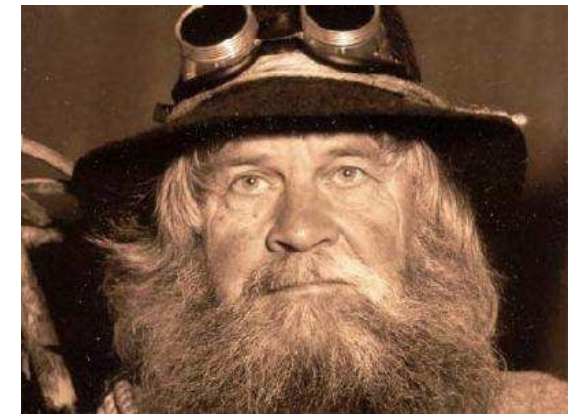


Petzl
Reverso



Understanding the Munter hitch

- Alternative to tubular belay device
- HMS: Halbmastwurfsicherung (Mastwurf = clove hitch)
- Friction created by bends in the rope and rope rubbing against rope.
- Advantage: rope runs well, fast belay
- Orientation of hand has less influence on brake strength.
- Never take brake hand off rope!!

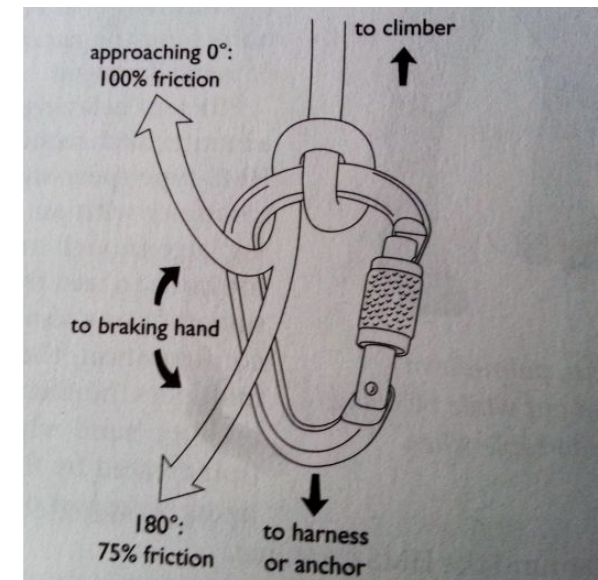


Werner Munter
Swiss mountain guide and
avalanche safety pioneer

Most friction



Less friction, still 75%



Assisted belay devices

- Tubular belay device and Munter belay require full belayer attention.
- Assisted braking devices are useful/required in gym or crag.
- Not all of them are useful for general alpine trips.
- Similar equipment throughout a class allows *everyone* to understand their climbing partner's set up.
- Know your equipment well if you use for instance a Mega Jul
- Note: even assisted brake devices require belayer's attention for example: https://www.youtube.com/watch?v=jKe72j_mBLU



Petzl
GriGri



Edelrid
Pinch



Wild
Country
Revo



Edelrid
Mega Jul



Edelrid
Jul2

Compare: non-assisted belay devices

Recommended for the course



BD
ATC



Petzl
Reverso



Mammut
Smart



BD
Pilot



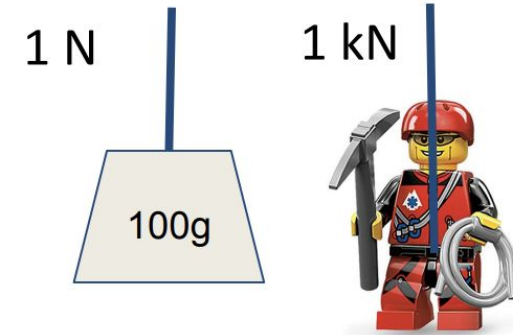
CT
ClickUp+



Gear strength



- strength measured in kN = kilo Newton
- climber with gear: 102kg = 225 lb = 1 kN (static)
- Force that gear can take?
 - carabiner 8-25 kN (watch direction of force, cross loading)
 - rope: > 11 kN, rope stretch reduces force
- 6-8 kN cause significant injury to climber
- Store gear dry and clean
 - wear and tear can impact strength of gear



RISKS COMMON TO LOCKING AND NON-LOCKING CARABINERS



Examples

Examples

Examples

Examples

Examples

RISKS OF DAMAGING THE LOCKING SLEEVE



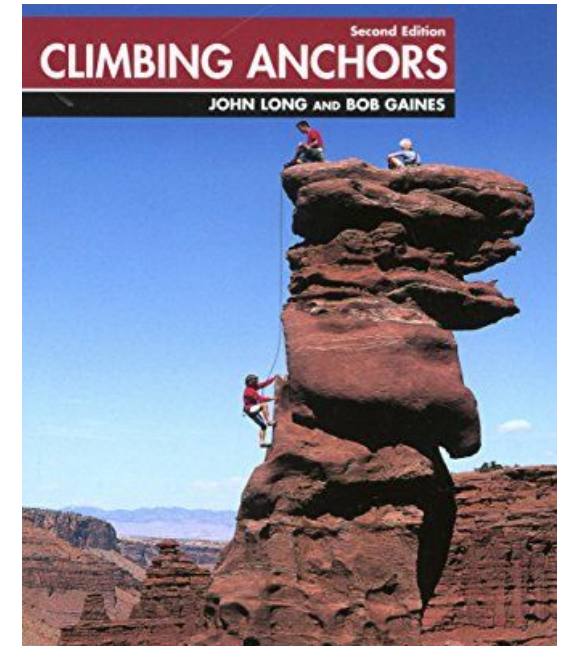
Examples

Examples

<https://www.petzl.com/US/en/Sport/Examples-of-dangerous-carabiner-loading->

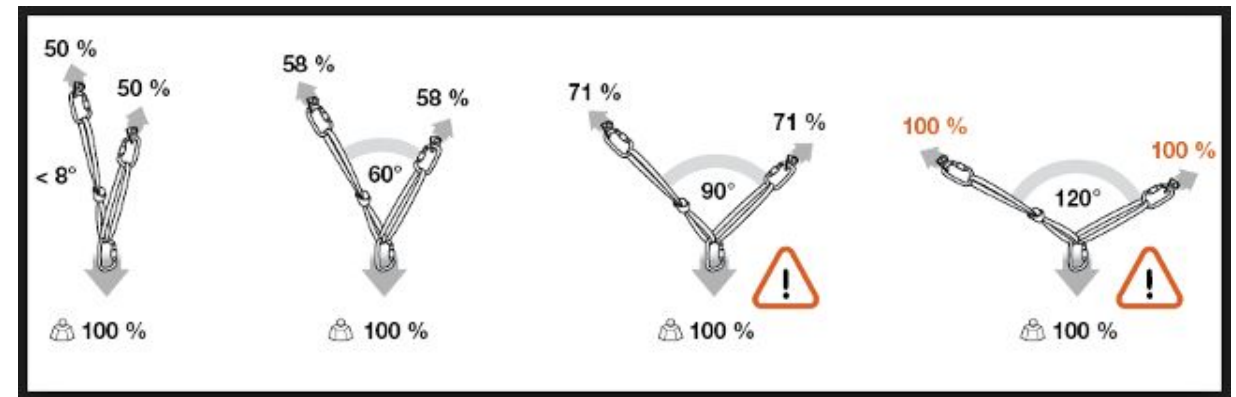
Anchors - purpose

- Single pitch: secure belayer, especially with weight difference or exposure
secure climbing rope at the top
- Multi pitch: secure climbing party
- Students **not** expected to set up anchors.
However, students should know concepts and identify good or bad anchors.



EARNEST concept:

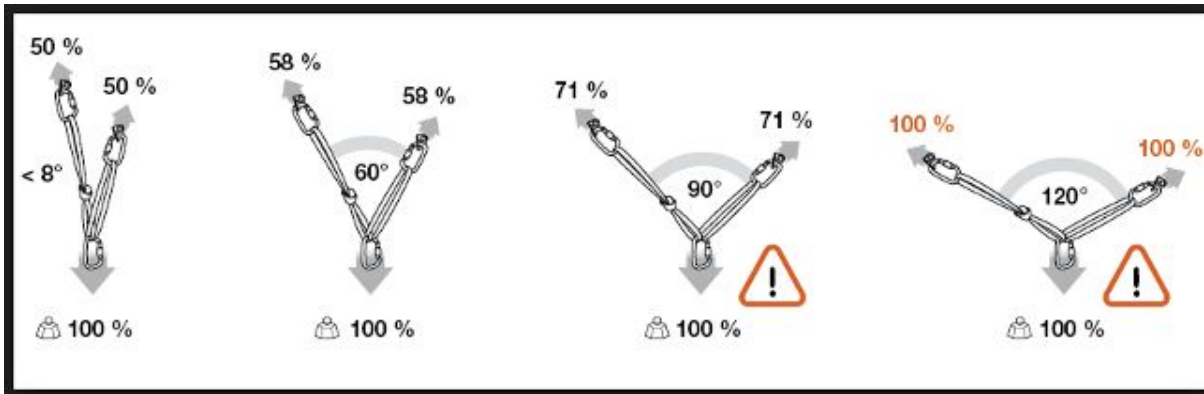
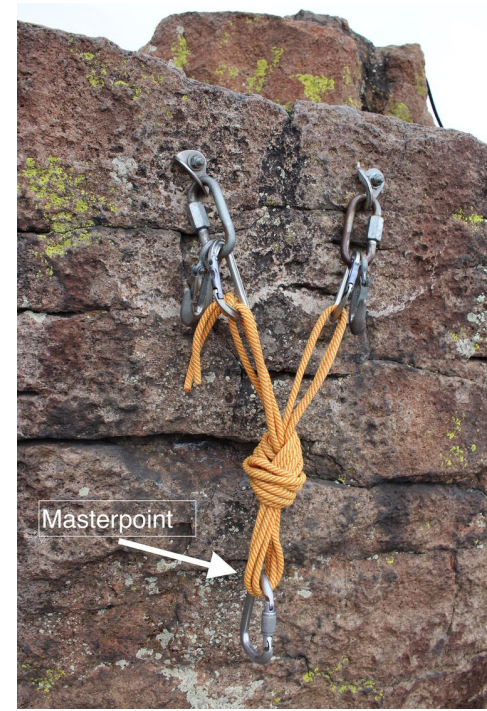
Equalized	similar force on all anchor points
Angle	acute angle between strands
Redundant	at least two attachments to the rock
No Extension	... if one part fails
Strong	strong enough for purpose
Timely	can be set up efficiently



Anchors - EARNEST

EARNEST concept:

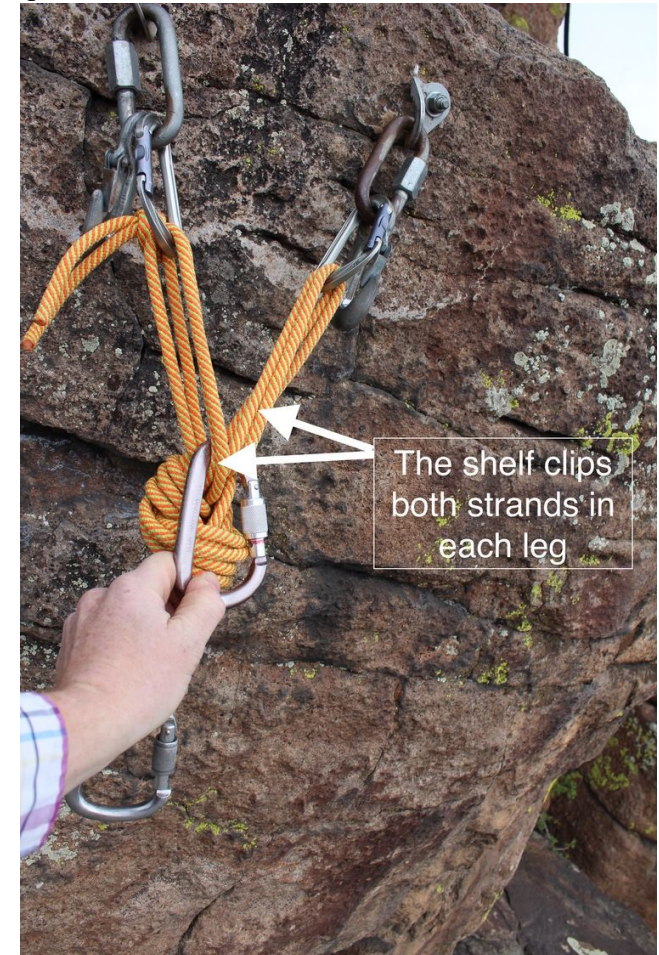
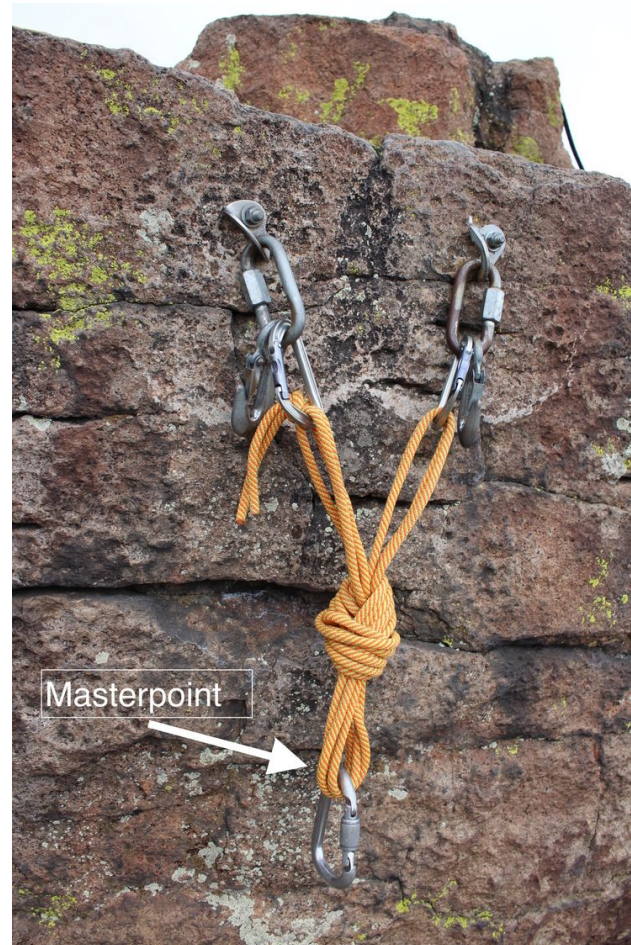
- Equalized similar force on all anchor points
- Angle acute angle between strands
- Redundant at least two attachments to the rock
- No Extension ... if one part fails
- Strong strong enough for purpose
- Timely can be set up efficiently



Climbing anchors - Power point / shelf

EARNEST:

Equalized
Angle
Redundant
No Extension
Strong
Timely



Climbing anchors - Types I

EARNEST:
Equalized
Angle
Redundant
No Extension
Strong
Timely



2 point cordelette anchor, bolts



3 point cordelette anchor, trad



Climbing anchors - Types II

EARNEST:
Equalized
Angle
Redundant
No Extension
Strong
Timely



Quad anchor, self-equalizing, bolts



Sliding X, self equalizing, bolts

Climbing anchors - Types III

EARNEST:
Equalized
Angle
Redundant
No Extension
Strong
Timely

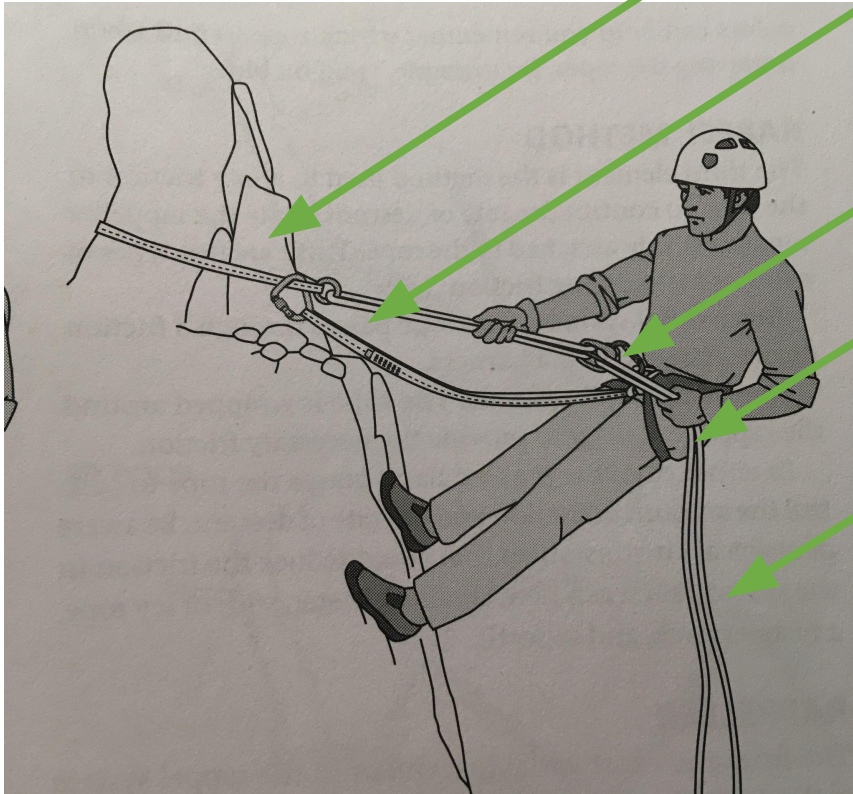


Tree anchor,
frequent on Basic climbs,
tree must be sturdy enough and well rooted,
watch: shelf is different!



simple sport climbing anchor,
rarely used in alpine settings

Rappelling



Anchor

Personal anchor / leash

Belay device,
extension

Autoblock,
3rd hand

Rope,
especially its ends

**Rappelling is a
very dangerous
part of climbing!
The climber 100% relies on the system!**



Forbidden peak, West ridge

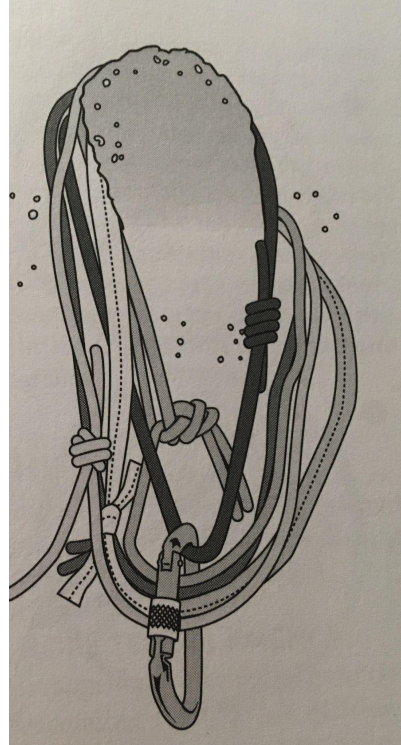


Rappelling



<https://youtu.be/7U6tdEevJgs>

Rappel - Anchor and rope



Rock (horn) or tree with tat,
frequently found on popular routes,
check anchor and tat



Middle of the rope at the anchor,
some ropes have middle markers,
measure if not.



Both ends with stopper knots on the ground or
at the next belay station (multipitch).
You do **not** want to rap off of the end!



Rappel - Backup



6mm cord (aka hero loop),
3x around both ropes,
clipped into locking carabiner in belay loop

Number of wraps depends on

- diameter of rope,
- age of rope (slick, fluffy),
- diameter of the hero loop, material,
- weight of the climber



6mm perlon,
sufficient for Course,
cheap



Hollow block
great friction



Rappel - Personal Anchor System



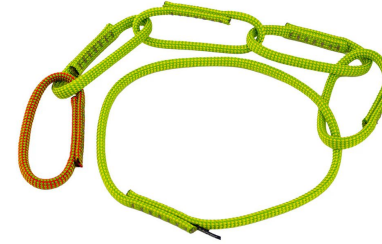
Metolius PAS

- + adjustable
- static material, more expensive



120 cm sewn nylon sling

- + dynamic material, cheap
- limited adjustability

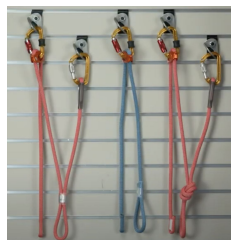


Metolius dynamic PAS

- + adjustable, dynamic material
- more expensive (\$45)

There are many opinions and preferences on gear choices and significance of dynamic material.

Do not climb above anchor point and fall on PAS.



Petzl adjust lanyards and others (not recommended)

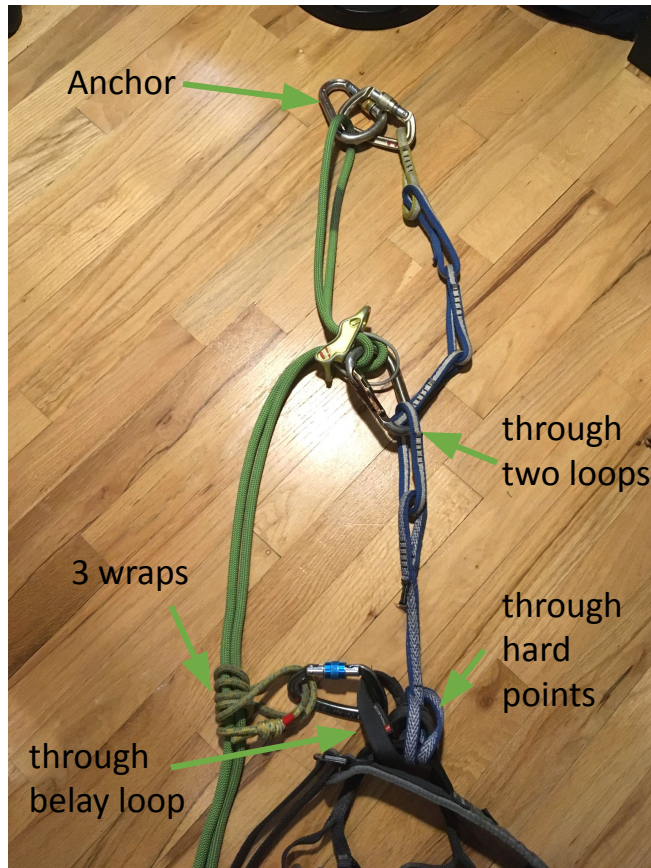
- + great adjustability, strong, dynamic material
- not all work for rappels



Daisychain

can rip out one loop after another (not recommended)

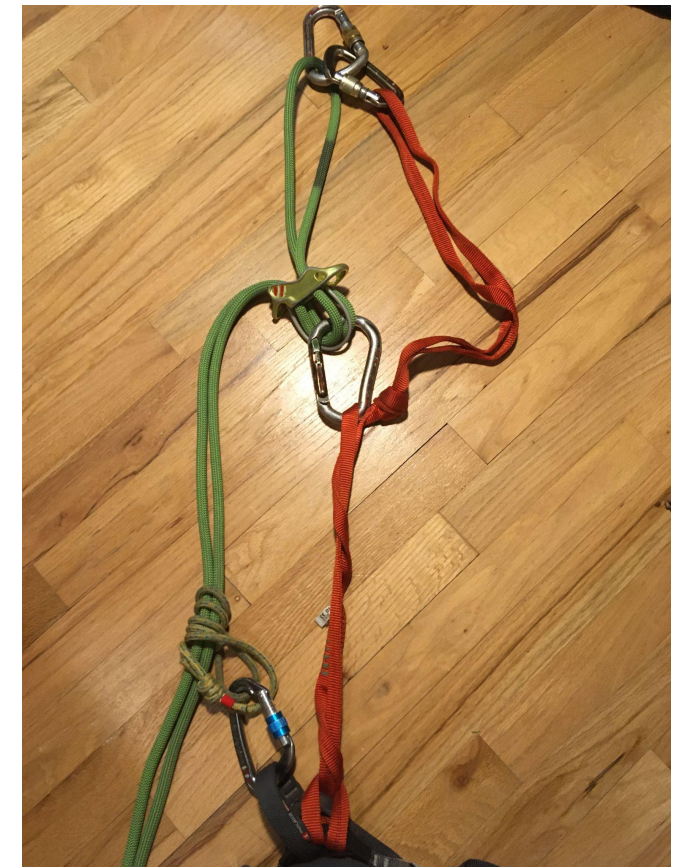
Rappel - Leash and Extension



Anchor and extension with **PAS**



Anchor and extension with **nylon** sling with **overhand** on a **bight** knot



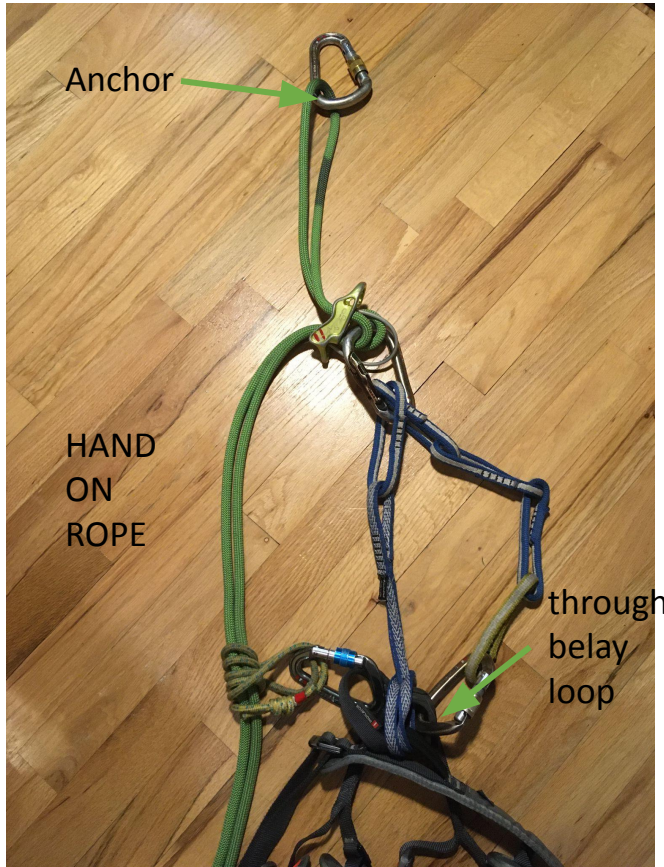
Anchor and extension with **nylon** sling with **overhand** knot



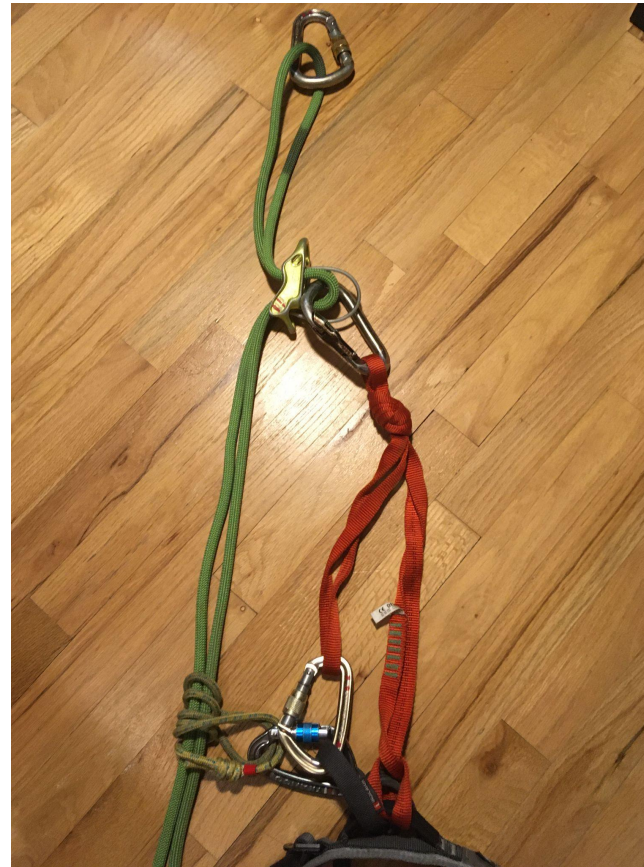
NO Dyneema sling!
ONLY sewn sling, NO knotted sling!
NO daisychain!



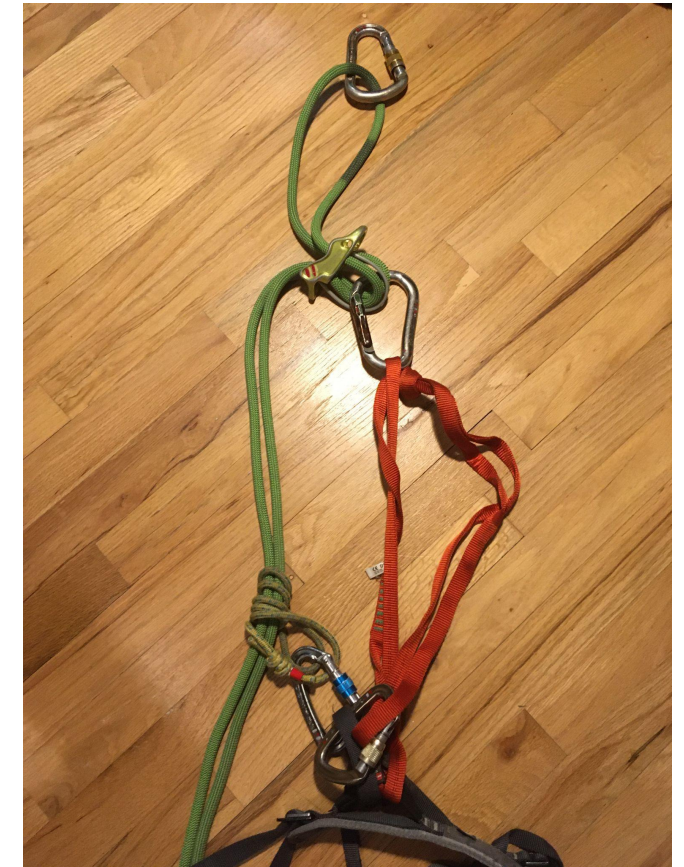
Rappel - Leash and Extension



Rappel extension with **PAS**



Rappel extension with **nylon sling** with **overhand on a bight knot**



Rappel extension with **nylon sling** with **overhand knot**



NO Dyneema sling!
ONLY sewn sling, NO knotted sling!
NO daisychain!

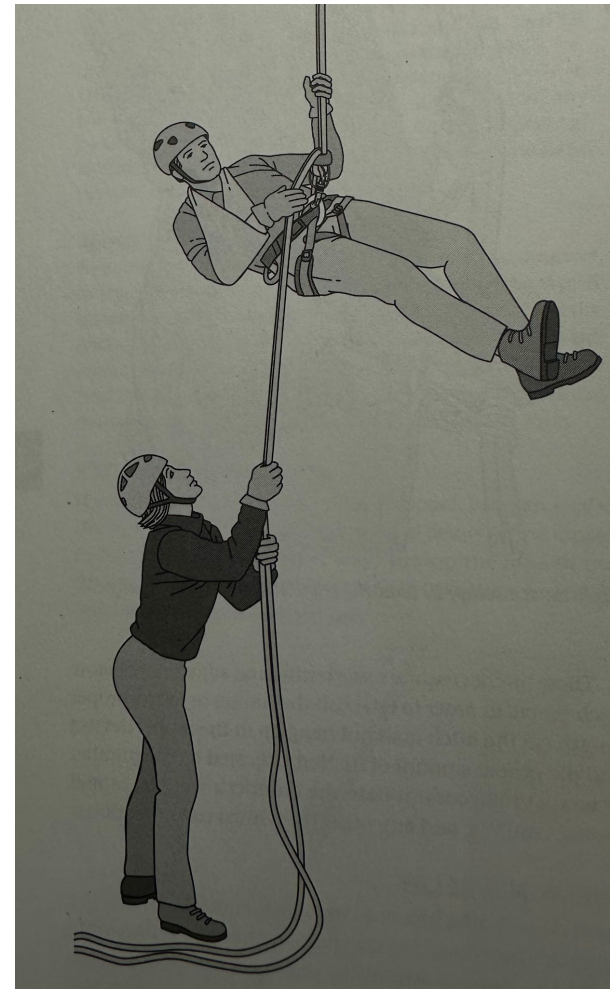
Rappel - Check and rappel

Before rappelling:

- Check anchor
- Check belay device set up:
both ropes through device and carabiner,
carabiner locked
- Check backup: does it hold the rope
- Check rope ends: on the ground and stopper knots
- Don't hesitate to ask for Fireman's belay
- "Rappelling" with outdoor voice

During rappel:

- Keep a good stance, feet shoulder width apart
- Smooth and steady rappel, no bouncing
- Take your time
- Hands always on the rope!



Fireman's belay
Also helpful for new climbers.



What's next: Skills nights

Skills nights are organized by SIGs.
They can happen every Monday evening until May.

Please sign up on Course page for each event
as for any other Mountaineers event;
insurance, utilization, volunteer hours etc.
More events will be added.

Seattle Basic Alpine Climbing Skills night (optional)

Seattle Program Center	Mon, Jan 6, 2025 Registration closes Jan 4
Seattle Program Center	Mon, Jan 13, 2025 Registration closes Jan 11
Seattle Program Center	Mon, Jan 20, 2025 Registration closes Jan 18
Seattle Program Center	Mon, Jan 27, 2025 Registration closes Jan 25

More events will be listed on an ongoing basis.

REGISTRATION STATUS

JAN ABENDROTH
Role: Instructor

Status: Registered

[Manage registration](#)

To register or cancel lectures and field trips, or to cancel entirely from the course, click the "Manage registration" button above.

BASIC ALPINE CLIMBING COURSE - SEATTLE - 2025

▶ Seattle Branch

i You are registering Jan Abendroth as a Instructor.

SEATTLE BASIC ALPINE CLIMBING LECTURE #1 - INTRO TO ROCK

You may optionally add any of the following activities:

[Mountaineers Seattle Program Center](#) – Thu, Jan 2, 2025 – Peter Clitherow
– 0 spots

SEATTLE BASIC ALPINE CLIMBING SKILLS NIGHT

You may optionally add any of the following activities:

- [Mountaineers Seattle Program Center](#) – Mon, Jan 6, 2025 – Peter Clitherow – 4 spots
- [Mountaineers Seattle Program Center](#) – Mon, Jan 13, 2025 – Peter Clitherow – 11 spots
- [Mountaineers Seattle Program Center](#) – Mon, Jan 20, 2025 – Peter Clitherow – 13 spots
- [Mountaineers Seattle Program Center](#) – Mon, Jan 27, 2025 – Peter Clitherow – 10 spots

Further information

Gearing up for the **Basic Alpine Climbing Course**, linked in the

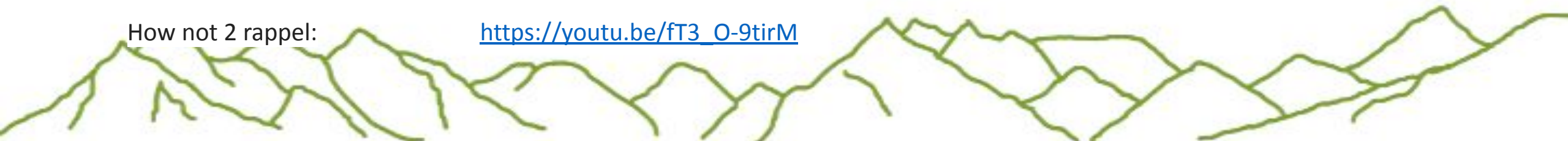
<https://docs.google.com/document/d/1qyyknO4c85ehLluBMLzsjAyGviiRacagW3N32RiNbY/edit?usp=sharing>

Interesting and fun videos

Belay video, REI: <https://youtu.be/CFIz4cBFVro>
Rappel video, REI: <https://youtu.be/7U6tdEevJgs>
Extended rappel, Mountaineers <https://vimeo.com/113362076>
Climbing knots, REI: <https://youtu.be/V1yq9XoAbCQ>
Library of articles and videos: <https://www.rei.com/learn/c/mountaineering>

Worst belay, Petzl: <https://youtu.be/V9hsWjA3SmU>
World's best belayer, Petzl <https://youtu.be/NJHVgkchcbw>

Rappel extensions, AMGA <https://youtu.be/jmCNNsjDrVA>
How not 2 rappel: https://youtu.be/ft3_O-9tirM



Welcome to the Basic Alpine Climbing Course



Logan peak, Banded glacier

We are looking forward to go climbing with you!