

VERBA BUENA LODGE ORDER OF THE ARROW

Presents



Taught by



Royaneh Village



To teach you about stoves and fuels.

Recommend appropriate stoves and fuels to use camping in the winter

Introductions







Stoves and Fuel Safety

FIRST THINGS FIRST, NO HOMEMADE STOVES!



Guide to Safe Scouting while using Chemical Fuels

Knowledgeable adult supervision
 (Adults are ultimately responsible)

The use of liquid fuels for starting any type of campfire is prohibited

Safety! Safety! Safety!



Guide to Safe Scouting while using Chemical Fuels

- No stoves, heaters, or gas lanterns in poorly ventilated structures
- Ventilated structure: at least two openings, one high and one low.



Guide to Safe Scouting while using Chemical Fuels

Maintain level, secure surface before operating.



Guide to Safe Scouting while using Chemical Fuels



Keep the instruction manual on hand

Practice using your stove before the trip!

Store fuels in approved containers in a ventilated area away from fires and flammable materials

Guide to Safe Scouting while using Chemical Fuels

- Use soap solution to check fittings on stoves.
- Keep stoves and fuels downhill from tents
 Gas spills will flow downhill

DO NOT PUT YOUR BODY ABOVE THE FLAMES!

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Guide to Safe Scouting while using Chemical Fuels

Do not leave a lit stove or lantern unattended.

Do not put heavy or large objects on top.

Bring empty fuel canisters home for disposal

Keep fuel canisters away from flames.



Guide to Safe Scouting while using Chemical Fuels

Only flashlights and electric lanterns are permitted in tents.

NO FLAMES IN OR NEAR TENTS

Advantages and Disadvantages of Chemical Stoves and Fires





To Stove or to Fire?

Advantages of Chemical stoves

- Quicker to light
- Cooking is more controlled
- Fuel on hand



Disadvantages of Stoves

- Limited fuel supply (can't "gather" fuel outdoors)
- Not very good for warming a lot of bodies
- Not the same feel as having a fire

To Stove or to Fire?

Advantages of Fires

- Social gathering spot (campfires)
- Fuel can be gathered
- Provides more radiating heat
- Fuel usually available



Disadvantages of Fires

- Could be hard to light (esp when surrounded by snow)
- Cooking is less controlled
- Takes time to gather and can be affected by environmental conditions like snow(wet wood produces less heat and lots of smoke)

Will it be Stoves or Fires? It's up to you when it's best to use either.

When Choosing a Stove, Consider:

- SAFETY FIRST
- Ease of Use
- Efficiency in your Conditions
- Fuel source (cartridge size, availability, etc)
- Environmental Impact
- Cost (return on investment)

Stoves and Fuel Types

AND THEIR ADVANTAGES AND DISADVANTAGES

Alcohol Stoves



Alcohol Fires are Invisible



Alcohol Stoves - Advantages

DO NOT USE!!! ALCOHOL STOVES ARE BANNED BY THE BSA!!!!

- Spilled Fuel Evaporates Quickly;
 Semi-solid Fuels Available
- No Priming (pressurizing and heating up a stove) required
- Lightweight
- Relatively easy to operate (mostly light and go)
- Altitude <u>shouldn't</u> be a problem
- Mainly used to boil water

Glorified Unpredictable Lighter



Alcohol Stoves – Disadvantages

- Highly volatile fuel
- Invisible flames

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- Low heat output per amount of fuel
- Limited control of heat
- Burns rapidly
- Small size means constant resupply
- Not used to cook

BANNED BY THE BSA



Butane (and Isobutane/Blend) Stoves



Butane stoves - Advantages

- No liquid fuel to spill (canisters are sealed)
- Lightweight canisters and burners available
- No Priming necessary
- Easy to operate and control
- Safe and reliable
- Medium Price Range, ~\$40



Convenient

Butane stoves -Disadvantages

- Liquid fuel, so must be kept above 32 degrees Fahrenheit to be efficient
- As fuel runs low, so does pressure and heat
- Altitude will become a problem
- Cartridges must be specially disposed
- Bulky

Poor performing in low temperatures and high altitudes

Isobutane and Blend Stoves – A Possible Solution

- Most are butane and propane blend
- Same type of lightweight canister and burners as butane stoves
- Relatively inexpensive
- Blends allow lighting in colder temperatures
- Still easy and still safe
- Canisters are interchangable
- Approx \$20-100

Compact and easy to use Works in colder temperatures



Isobutane and Blend Stoves – Disadvantages

Not ideal for below freezing

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- Special tools needed to recycle canister
- As fuel runs low, so does pressure and heat.



Improvement over Butane but still doesn't work well below freezing

Inverted Canister Stoves (Integrated Canister)

- Same type of lightweight canister and burners as butane, isobutane, and blends
- Provides liquid fuel-type winter performance due to being inverted
- Blends allow lighting in colder temperatures
- Works below 32 degrees Fahrenheit
- Approx \$200 for the example shown



Similar to butane in size and ease of use Works in freezing temperatures

Inverted Canister Stoves (Integrated Canister)-Disadvantages

- High fuel consumption rate
- Built-in pot
- Not easily serviceable or repairable while camping



Needs more fuel and not flexible

Propane stoves



Propane stoves -Advantages

Advantages

- Very safe
- High heat output per canister
- Easy to operate
- Relatively Inexpensive ~\$50
- Commonly available



- Stoves can have multiple burners to cook multiple items at once
- Certain stores will exchange empty canisters @ \$0

Portable "kitchen-like" stoves

Propane stoves -Disadvantages

Disadvantages

- Inefficient below 32 degrees Fahrenheit
- Bulky, heavy cartridges
 (bigger group → more cartridges)
- Often larger burners
- Cartridges must be specially disposed



Heavy, not good in cold temperatures

White Gas stoves



Hybrid (options)

White Gas - Advantages

- Very high heat output
- Spilled fuel evaporates quickly
- Functions at very low temperatures
- Fuel readily available
- Can use with heat reflector and windscreen
- Good stove for large groups/patrols
- More expensive ~\$150
 Ideal for Snow Camping
 Most versatile



White Gas - Disadvantages

- Liquid (spillable) fuel
- Don't spill this stuff on skin in cold weather, can give frostbite
- Both Liquid and fumes can ignite
- Priming required
- Self pressurizing stoves must be insulated from cold to work
- Users may need practice and experience to operate efficiently



Single burner with a slight learning curve

White Gas Fuel Consumption Guidelines

(3 Ounces) x (# of people) x (# of days) + 1 liter for extra use = fuel consumption

This formula will work as a general fuel consumption estimate for winter camping. For snow camping at higher elevations and lower temperatures, extra research should be done to find fuel consumption as altitude and temperature affect stove efficiency

> Plan to bring plenty of extra fuel! And have fuel bottles filled according to the manufacturer's instructions

Summary Slide

Quick Guide to Backpacking Stoves

Good for:	Canister	Integrated Canister	Remote Canister	Liquid Fuel	Wood- burning	Alcohol/ Tablet
Cold weather / high elevation	X (some)	X (some)		Х		
Larger groups		х	Х	х		
Boiling water mainly		х		х	х	Х
Simmering	х		Х	x		
Ultralight hiking	х		Х		Х	Х
International travel				X (multi- fuel)		
Ease of use	х	Х	Х			Х

From REI https://www.rei.com/learn/expert-advice/backpacking-stove.html Questions?

On to the Kahoot!