

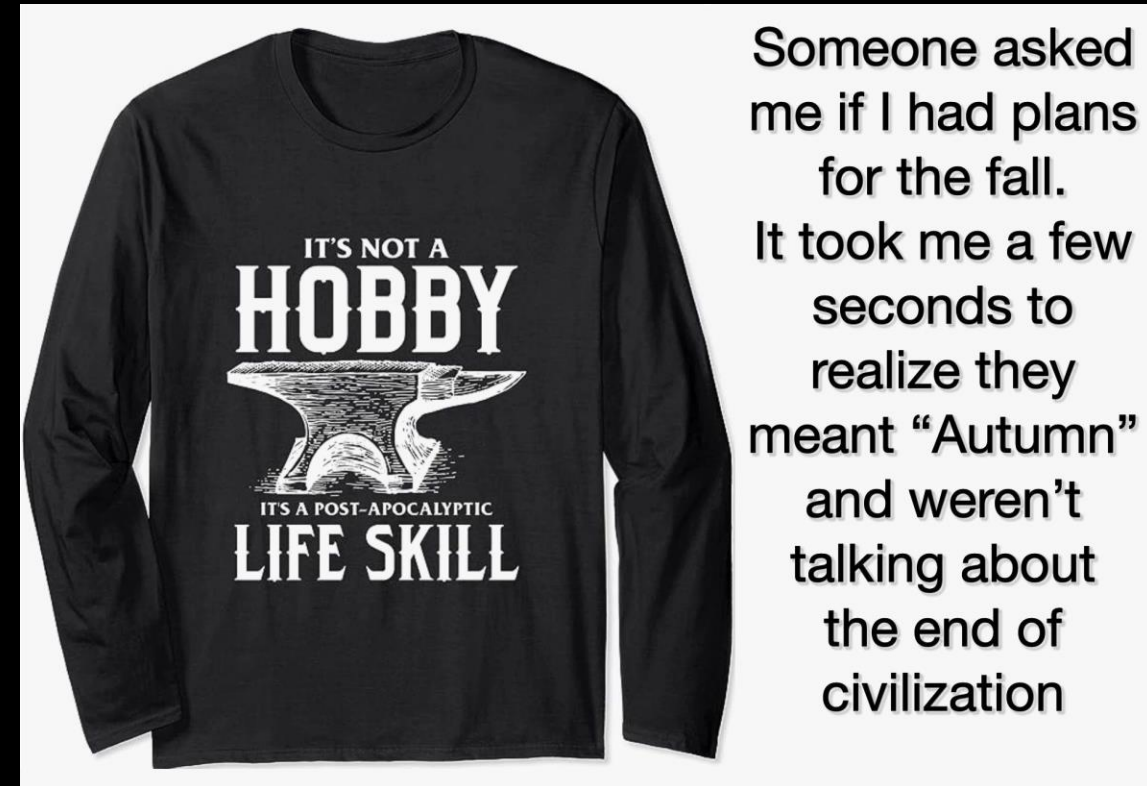
CULTURE DAYS: THE ART OF BLADESMITHING

with Bob Bryenton - Solar Storm



AGENDA

- Approx 90 min
- What is Bladesmithing?
- Safety
- Tools
 - Basic tools
 - Intermediate tools
 - Advanced tools
- Forge Types, Gas, Coal, Electrical/Induction
- Making a blade
- Getting Started
- Questions



BLACKSMITHING

Remember When...

Everyone needed a bladesmith.



Woman practicing cutting off a head while riding a bicycle.

Was first used in the 13th century to distinguish a worker of "black metal" (iron) from a "whitesmith" who worked with lighter metals like tin.

A registered Trade

<https://Smithlist.net> is a place where you can see a registry of all of the North American Blacksmiths and Bladesmiths.

A Bladesmith is just a specialized form of a Blacksmith.

Forged in Fire is a Reality TV show. A good one, but still TV entertainment first

Movies and TV are 120% inaccurate as to how, and what a blacksmith does.

Need a Tool, Make a Tool



This is the way!



TOOLS



- Steel is a liquid. With enough pressure, it will deform
- Safety Equipment – **EVERYTHING in the shop is actively trying to kill you!**
- Basic tools are a hammer and an Anvil.
- The most important tool is – Heat! 🔥
 - Heat is created in 3 different ways
 - Coal Fire
 - Propane Fire
 - Electrical Induction
- Pressure is created between the hammer and the anvil
 - Different shapes of anvil and hammers create different pressure points to move the steel in different directions

MINIMUM SAFETY EQUIPMENT

- Fire extinguishers – Not all fire extinguishers are equal. They expire!
- Safety glasses, and/or face shield
- Steel Toed work boots. Leather.
- Leather Apron
- Lots of welding gloves
- Hearing protection

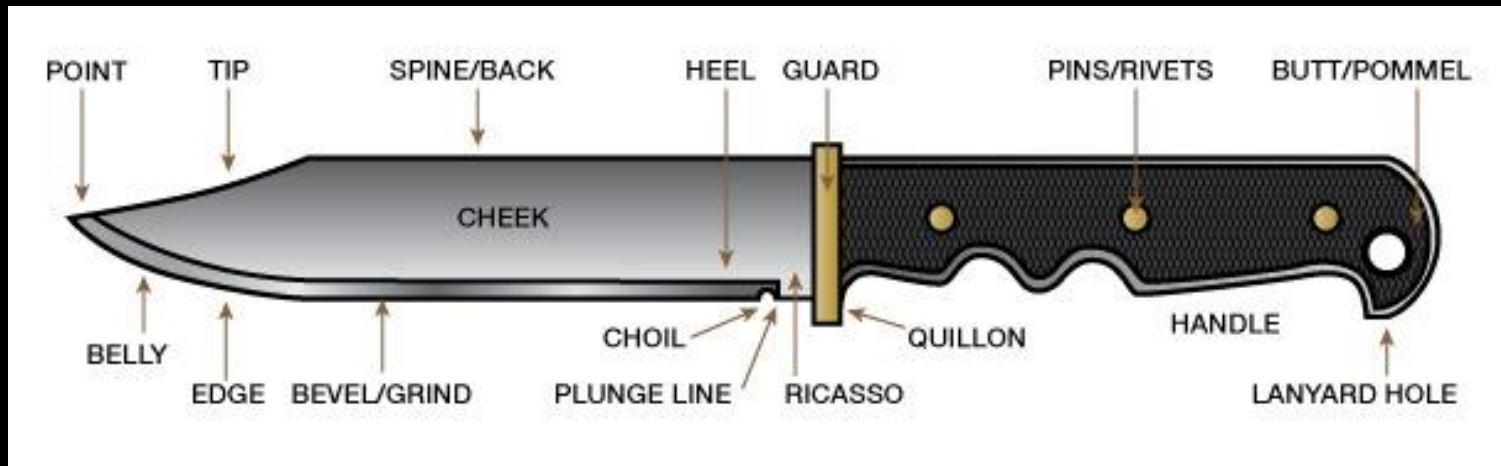


Symbols found on fire extinguishers & what they mean

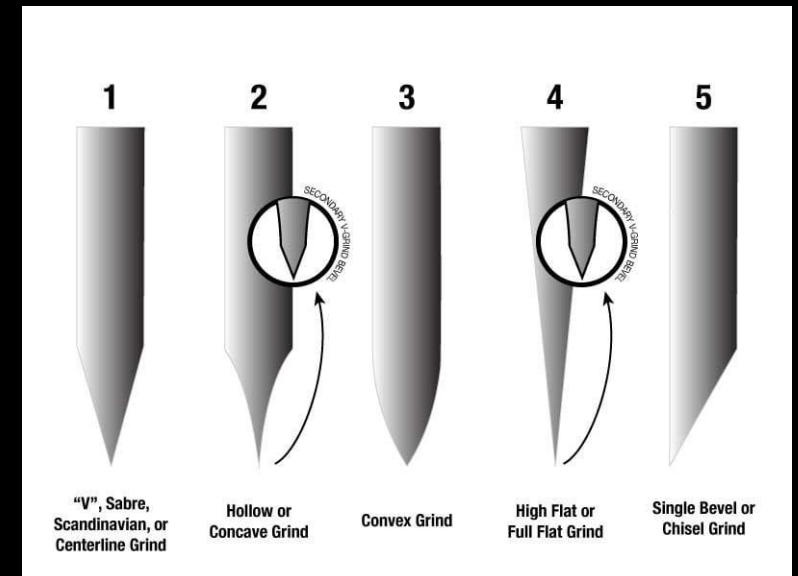
	 Water	 Foam spray	 ABC powder	 Carbon dioxide	 Wet chemical
Wood, paper & textiles 	✓	✓	✓	✗	✓
Flammable liquids 	✗	✓	✓	✓	✗
Flammable gases 	✗	✗	✓	✗	✗
Electrical contact 	✗	✗	✓	✓	✗
Cooking oils & fats 	✗	✗	✗	✗	✓

TERMINOLOGY

Anatomy of a knife



Grind types



- Hammer and Anvil
- Heat
- Files and sandpaper



BASIC TOOLS



HAMMERS



Oh sure, When Thor
throws his hammer,
He is saving the world.



When I throw
mine,
I have anger
issues...



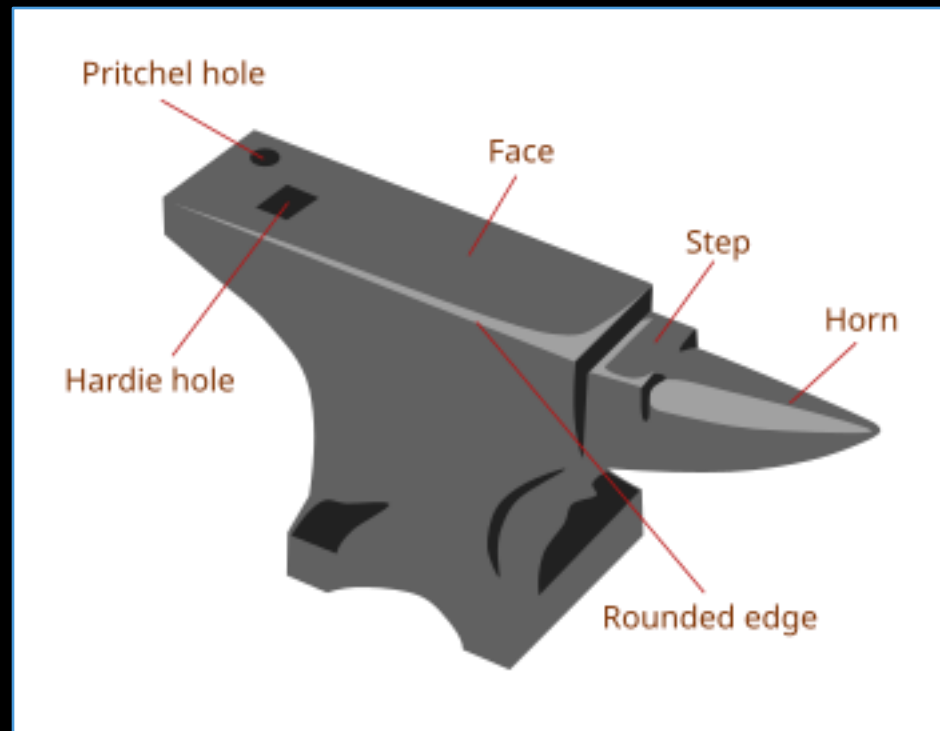
Imperical Testing

I have determined that no
matter the shape or size of
the hammer...

You can't smack the
stupid out of people!

ANVIL

- Really any heavy solid object can be used as an anvil
- Anvils provide a solid object to create the pressure behind the hammer and steel.



FORGES

- Propane Forge
 - Easy
 - Portable
 - High Heat
- Natural Gas
 - Requires a special high pressure gas line
- Burner Types
 - Venturi
 - Ribbon



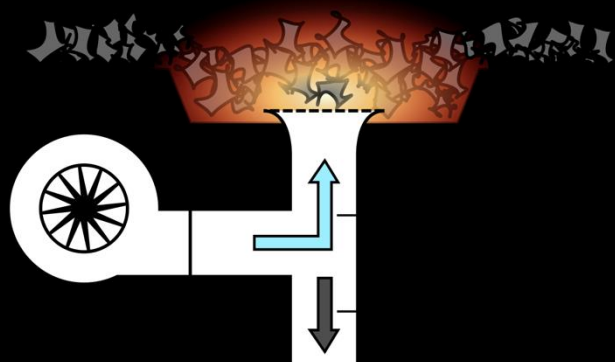
RIBBON VS VENTURI

- Venturi
 - Mixes Air and propane
 - Draws the air through a vacuum as the propane oxygen ignites
 - Works simply off of pressure.
- Ribbon
 - Multiple small holes under a mixing chamber
 - Requires constant air pressure
 - Less portable
 - More control over combustion



COAL FORGE

- Burns Coal for heat
 - Requires Air – Bellows
- Very high heat
- Popular for artists, and traditional blacksmithing.



INDUCTION FORGE

- Uses Electromagnetic Induction to create heat
- Very precise control



MORE ADVANCED TOOLS



WELDER

- Not absolutely required, but very useful
- Mostly used in preparation, but occasionally during a build
- Not that expensive, but learning curve can be steep.
- Example: making the Trench Knife



2X72 GRINDER

- The work horse of the bladesmith
- Many hours can be spent at the grinder.
- Creates fantastic amounts of dust and heat
- Arming Sword fuller and Bevel



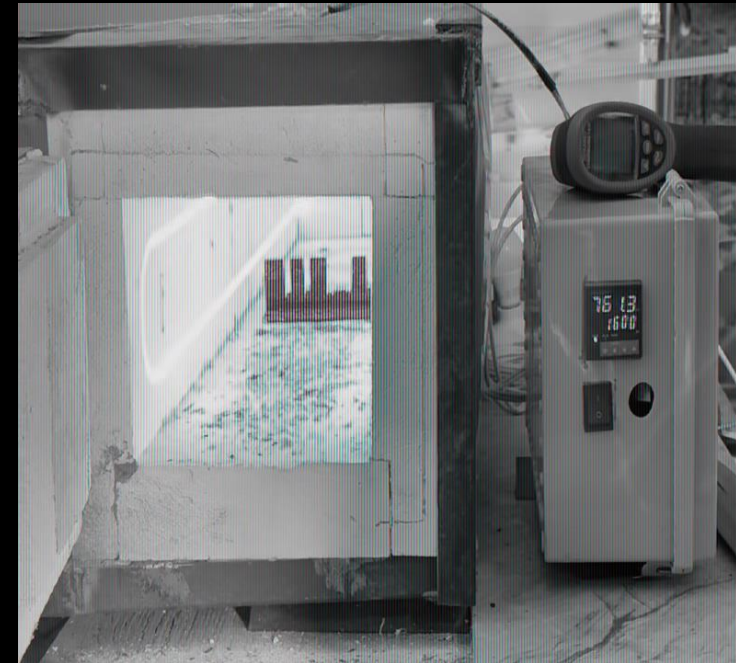
PRESS

- Replaces the hammer and anvil
- Usually between 6 and 50T of pressure
- Drawing out steel.



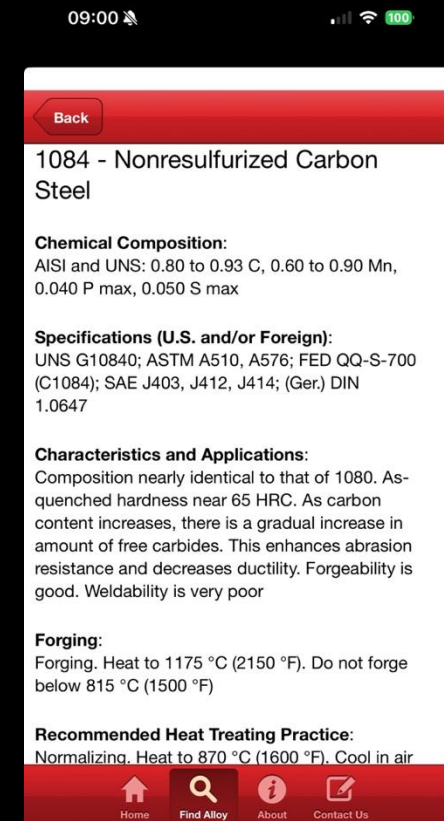
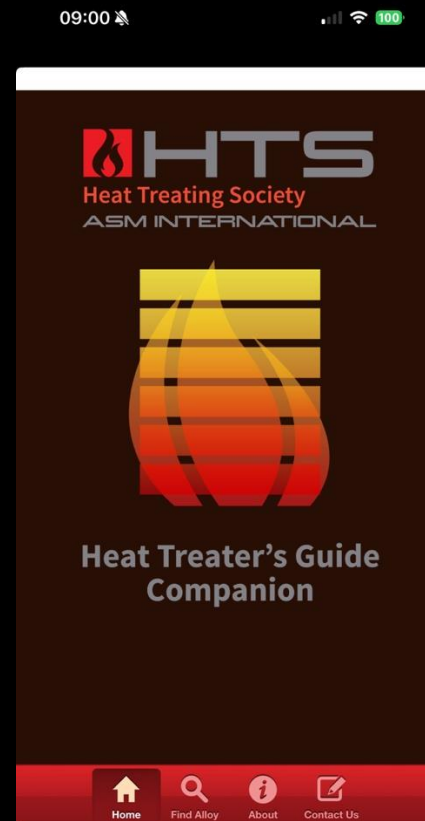
- **Normalizing** involves heating a material to an elevated temperature, holding it for a period, and then cooling it in still air to room temperature. This process refines the material's microstructure, creating a more uniform and fine-grained structure with improved ductility and toughness, while reducing internal stresses, hardness, and brittleness.
- **Quenching** is the process of **rapidly cooling a heated metal workpiece** to alter its mechanical properties, making it harder and stronger.
- **Tempering** is a heat treatment process that reduces the brittleness and increases the toughness of metals like steel, making them more durable without significantly sacrificing hardness and strength

HEAT TREATMENT



HEAT APP

- Free!
- Heat treatment formulas
- Descriptions of characteristics.



KILN

- Heat treatment is giving the steel its soul
- Up to this point it is a KSO (knife shaped object)
- Recipes to achieve different properties can be quite complex.
- Kilns are preferable over forges because temperatures can be very accurately controlled
- [Make your own kiln](#)



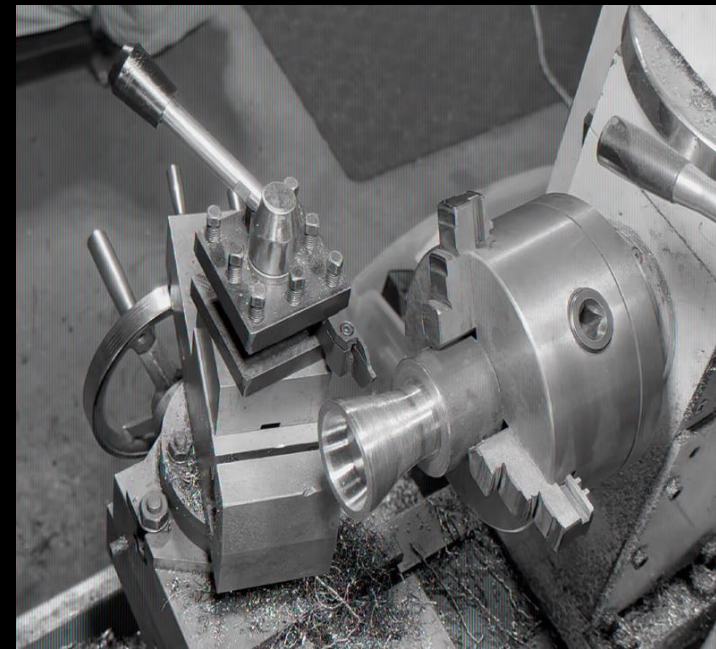
QUENCHING

- Using the HEAT app many different “Oils” and quenchants are used
- Fireballs are usually a sign that the steel was too hot.
- [Quenching a Sword](#)
- [Straightening Jig](#)



MILLING MACHINE AND DRILL PRESS

- Drill press allows control of speed, and pressure
 - Ensures vertical holes
- Milling Machines and Lathes allow for accurate shaping of small parts. Can also double as a drill press
 - Extreme accuracy in an experienced operator's hands
- Turning a Pommel Nut





DAMASCUS



- Random Patter
- Subtractive patterns
 - Ladder, Raindrop, etc.
 - Produced by exposing the edges of the layers by grinding off steel in a pattern
- Distortion patterns
 - Twists, Feathers
- Mosaic patterns
- Hybrid patterns
- Damascus can only be as good as mono steel, not better.
- There is no such thing, today we make Pattern Welded Steel and call it Damascus

DAMASCUS



STACKING

- Damascus gets its pattern from using two or more different types of steel
- The steel is stacked, squished and restacked, to create different layers



ETCHING STEEL

- Etching is the process of corroding the steel. Some steels corrode easier, some resist giving the different colors.
- Etching the Kopsis
 - Making your own etchant



MAKING A SWORD



Sword Build

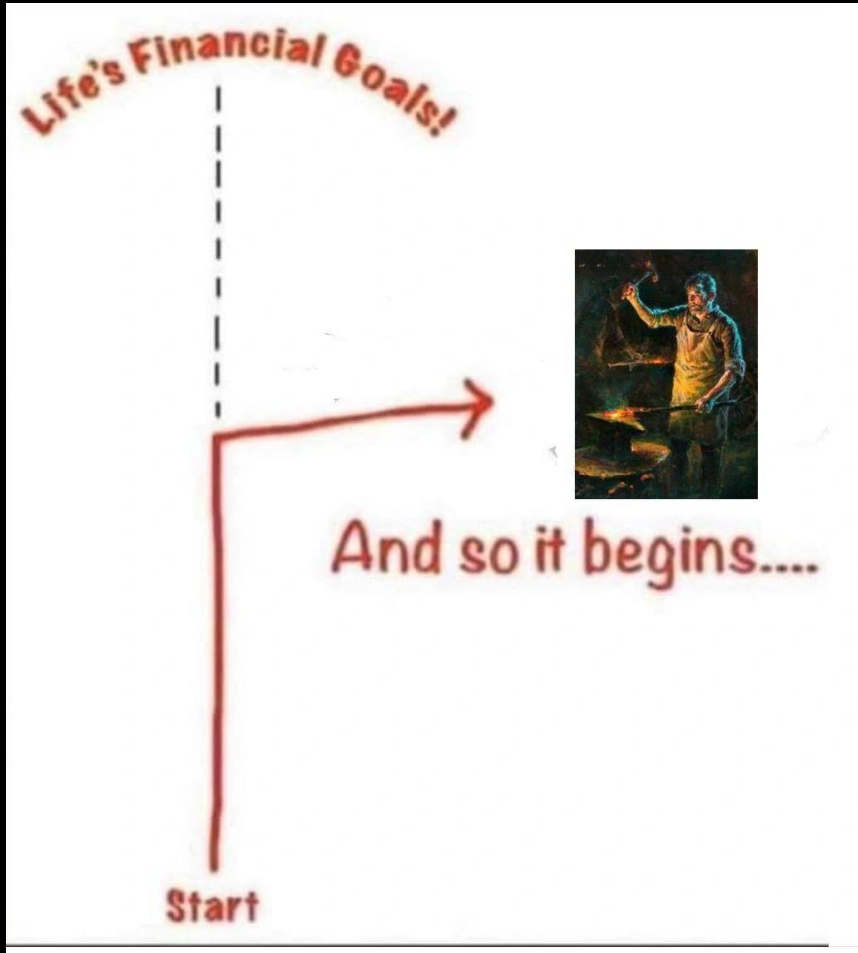
Making a fluted Handle

CARE AND FEEDING OF YOUR KNIFE

- Carbon steel will rust!
- Clean your knife after every use – NEVER in a dishwasher
- Oil your knife – for cooking knives, Camellia Oil, for non-food, gun oil is great.
- Never store in a sheath or scabbard.
- Keep it sharp. Use a honing rod.
- Store separately.



GETTING STARTED



STEP 1

TAKE A CLASS

- Private or Group it will save you time and money
- Group
 - Usually cheaper
 - Pace is median of the group.
 - Very structured
 - Ability to learn from other students
- Private
 - Targeted instruction
 - Your pace
 - 100% attention of the instructor



I went to a blacksmith class one time.

**Someone shouted,
“Anyone know CPR?!”**



**I Shouted, “EVEN
BETTER! I know the
whole alphabet!”**

Everyone laughed...



**Well, except for this one
guy...**

START MAKING

- Use scrap steel
- Learn to use the hammer
- Ask for honest feedback
- Learn from mistakes
- Don't chase mistakes
- Plan the build, build the plan



ENHANCE YOUR SKILLS

- Learn how to create your own handle material
 - Wood stabilization
 - Epoxy Resin Casting



LEATHER WORK



When making your sheaths
It is important to understand
Leather is rated on its texture.

Leather that comes from cows
close to a
water source are normally softer
and rated

Grade A leather

Leather from hot, dry climates
are usually

D Hide Rated

- A must for selling. A knife that can't be carried, hunting or chefs knife, needs to be protected and carried
- You can outsource your leather work, but it costs money that eats into your profits.
- [Making a Sheath](#)

OTHER WORK



Making a Rose



LINKS

- Website: <https://www.solarstorm.ca>
- YouTube: <http://www.youtube.com/@solarstorm50>
- Facebook: <https://www.facebook.com/SolarStormForge/>
- Email: bob@solarstorm.ca
- Phone: 780-953-0016



You know how they throw the ball in to the crowd after a win?
Well I found out that is bad form to do that with your
hammer at a blacksmith competition...



QUESTIONS:

THANK YOU AND A PSA

