Outdoor Education 110: Alternative Fire Making using the Bow Drill Fire Set

Rational: *In this unprecedented time, where you are not hampered by I hour periods to work on this skill in the regular school day, you have the time to see this skill to completion. Keep at it and have someone record your eventual success to be uploaded!*

1) Research the "kit" components. (bow + string, the spindle, hearth board, bearing block and the ember catchment piece (bark) on YouTube.ca. I have several pointers embedded along the way and in the "Tips from Uncle Pauley" section below. Make a few notes:

Please note: Before your actual attempt with the bow drill (after a pilot hole has been made) you will want to make two other key preparations. First, a "tinder bundle", aka bird nest, for your ember to be placed into, once it is formed. Second, you will want to have you fire lay/camp fire prepared in advance as well. It matters not: Log cabin, TP or other style, however, the key is to be prepared in advance! Nothing worse than losing an ember, (which can last up to 6-7 minutes), after all the hard work to produce it, simply because you were not prepared to receive it! Third, scroll down to read through "Tips from Uncle Pauley" before you embark on this mission –possible! And finally, humidity is a factor; making this already tough endeavor more challenging when the weather is damp and humid. Also, keep your set from getting wet!

2) Acquiring the raw material for your set, again YouTube.ca can be helpful here for the visual.

Bow: Using a pruning tool, such as a hand saw, loppet or anvil sheers, cut out your bow from a live tree limb. Your bow should be about as long the distance between your bicep to your fingertips. Consider drilling a hole through the handle end to secure the para cord. Leaving a natural v-branch near the end of the bow can make tying off handy! No need to finish tying off until you know the gage of your spindle.

Consider gathering material for your Catchment bark, tinder bundle (ie. cedar bark) and fire lay materials while out selecting your bow limb!

Hearth Board: Although parts of a dry dead cedar limb could be shaped for use as a hearth board and a spindle, I prefer cutting (ripping off with a table saw) a ¾ to 1 inch (2-2.54 cm) strip off a dry rough cedar board for the spindle portion, leaving the remainder for the hearth board. You want a hearth board between 14 - 16 inches (35-40 cm long) and 3.5 to 5 inches (8-12 cm) wide, so you can have room for multiple tries.

Spindle: Begin shaping carefully with a knife or through sanding to achieve a rounded spike like shape, flatter on the downward end and pointier on top. Starting with the longer piece will allow you to bypass imperfections in the wood. In the end the spindle should be at least 8 -12 inches (20-30 cm) in length the necessary preparation of the hearth board, spindle and bow.

Bearing Block: Need something harder than your hearth board, preferably something comfortable to hold in your hand with a concave/cup shape to secure the end of the spindle under your palm. I usually shape a piece of scrap hardwood for this, however, rocks, shells or something metal could work as well.

3) Final preparation of your set so that it can be ready to produce an ember.

A) Begin cutting a pilot hole for your flat spindle end with a knife. You want your spindle to be spinning about ¼ inch (approximately 1 cm) from the edge of the board.

B) Assuming the hand end of the bow string is already tied, secure the other end of the string to the near end of the bow with some slack in the string. How much slack? Enough to allow you to "flip" the spindle onto the string. Start with flat end up and then flip it through the string so as to have one wrap of the string around the spindle, resulting with the flat side down. This should require some effort and if released, the spindle should fly across the room!

C) Do some practice spins with the spindle to help deepen the pilot hole. **Note: This is the most difficult drilling because your spindle lacks proper guidance (a pilot hole) to secure it!** You may in fact get some smoke, however, your hearth board requires preparation before you go for the ember!

D) Assuming your pilot hole has been started, use a knife of small hand saw to create the notch for your ember to grow in. Start with a thin straight cut from the edge of the hearth board into the center of the pilot hole. Then, ensuring not to remove too much "shoulder wood" that will keep your spindle from slipping out, begin cutting an upside down notch (narrow at the top –pyramid shaped). You want it no more than 2 centimeters on the bottom and less than 0.5 centimeters on the top.

E) Flip your spindle onto the string and take a few strokes, fine tuning your bow string with your grip hand fingers to get the "right friction", a spin with effort.

F) If all your other preparations are made (tinder bundle, fire lay), your catchment bark is secured under the notch and you have taken note of the particulars of the "proper" body position stance/set up to lessen fatigue and ultimately allow you to be successful – then go for it!

Tips from Uncle Pauley:

a) Make sure you are getting long strokes with the bow (like in the natural swing of the arm while walking) using those longer back muscles. Avoid short strokes using the shoulder mainly on a diagonal or in front of your chest.

b) Make sure the interior part of your forearm (of the hand clutching the bearing block) is braced tightly against your shin. Simply leaning forward can add the necessary pressure required (darker dust produced) vs. trying to exert more downward pressure on the spindle itself through pressing down harder on the bearing block.

c) I have had much more success when I got "fussy" about my stance, placing my back knee directly behind the heel of the foot holding down the hearth board. This forces you to lean forward and brace for balance. Place something under the knee to increase comfort as you may be in that position for a little while!

d) I recommend using a cedar hearth board and spindle. Your bearing block should be made with a harder material like maple or oak.

e) The bow itself should be lighter and thinner vs beefy as you will get tired more quickly. A small curve is usually sufficient. I have used alder and birch, however, as long as it is sturdy (preferably hardwood species) it should be fine.

f) With your spindle, ensure your ember end is flatter than the bearing block end, so as to increase friction. I have seen spindles of different diameters work, it is a matter of availability/preference.

g) For best results, use parachute cord for your bow string. Some people drill a hole through the handle end of the bow to secure that end. String it tight enough so the spindle will flip/spin out of the configuration if allowed to.

h) You can grasp the string while gripping the end of the bow to slightly increase the tightness of the string. This will increase the friction and hopefully allow you to bypass having to stop and adjust the string knots.

i) A skateboard wheel, with bearings still in place, can be used as a bearing block (as a bit of a cheat), as it will produce almost no friction up top and make for more in the hearth board.

j) Once you achieve lots of smoke, don't stop drilling! Go at least another 20 to 40 strokes to ensure you have sufficiently fed your ember.

k) Before picking up your catchment bark to dump your ember into your tinder bundle, fan it with your hand. This will allow it to solidify and for you to catch your breath!

l) Once your ember has been relocated to your tinder bundle, carefully wave it around to provide oxygen for the bundle to ignite. Obviously blowing on it can help too. Once it has burst into flame, park it into your pre-prepared fire lay and feed it. Congratulations you have produced fire from raw materials!

m) Not there yet? Stick with it! There are few things out there these days that require such tenacity and resilience, as so many everyday tasks have been simplified through technological enhancements. Succeeding here will result in a tremendous sense of satisfaction and build your confidence as an outdoors person!

Some things to consider:

1) What were the strengths and weaknesses of your kit's components? What would you change, in terms of your kit, to make your end result more successful?

2) Did you meet with some success in this fire making endeavor? How far did you get towards creating an ember? Reflect on and explain your particular outcome/results.

3) Why would Mr. Mackinnon encourage you to prep these "kit materials" and have students engage in such a "challenging endeavor" when lighters and matches are so readily available?

4) What do the terms persistence and resilience mean to you? Again, in this unprecedented time, you have the time to see this though. Keep at it and have someone record your eventual success to be uploaded!

5) Want to try the "hand drill" next?

6) Reflect and give yourself a mark or rating out of /10 for your efforts to succeed in this mini unit!