

Woodgas Camp Stoves

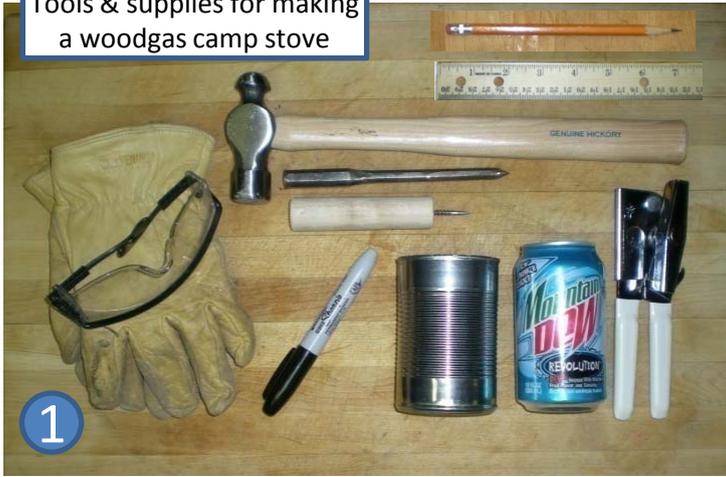
RENEWABLE ENERGY TRAINING CENTER

MORRISVILLE STATE COLLEGE



<http://retc.morrisville.edu>

Tools & supplies for making a woodgas camp stove



1

Carefully punch 12 to 15 vent/draft holes.

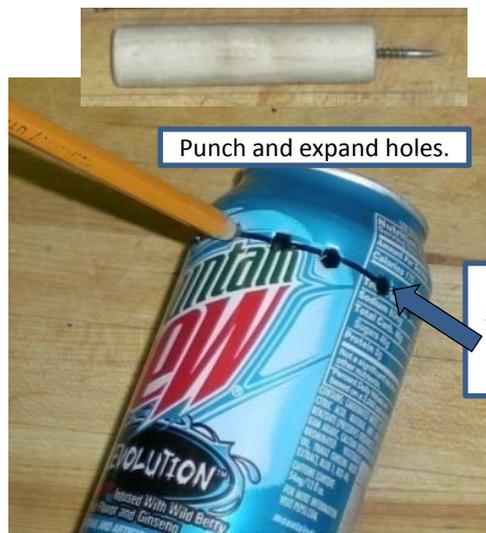


2



3

Mark a reference line about 1 inch from top for burner air inlets.



Punch and expand holes.

4

10 holes: 3/16" (0.5 cm) diam., evenly spaced*



5

Remove top.



6

Punch air vent holes in the tin can.



7

Assemble stove: nest cans by seating soda can snugly in/on bottom. The stove is now complete!

*You can use these bars to mark 10 evenly-spaced holes around the perimeter of the soda can.

Scale Bar = 1"

These woodgas stoves are batch loaded, easy to build, fun to use, and nearly smokeless when properly fired. Our design is an adaptation of the "batch-loaded, inverted down-draft gasifier" described by Ray Garlington (<http://www.garlington.biz/Ray/WoodGasStove/>) and based on Reed and Larson's 1996 paper "A wood-gas stove for developing countries". For more "woodgas" information, see: <http://www.woodgas.com/>. Note: any references to or images of commercial products or brands does not constitute endorsement of any particular product or brand by the RETC; they are simply for illustration purposes.

Using the Woodgas Camp Stove



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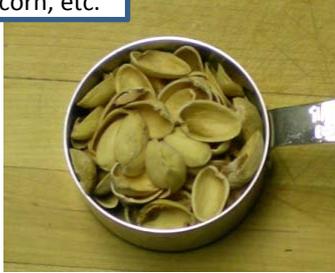
8

Select a fuel: wood pellets, chips, twigs, nut shells, corn, etc.



9

Load the fuel into the soda can (maximum level up to burner air inlet ports). ~1/2 cup of pellets works well.



10

Ignition is easiest with 1-2 cotton balls dipped in alcohol (denatured or isopropyl), then set on top of the fuel in the soda can.



11

Ignition source/lighter – light the top of the fuel in soda can.



12

Woodgas production & combustion (shortly after ignition)
Note: DON'T add more fuel after ignition (these are batch run)



13

Steps 12-16: Placing the stove in a gallon can with gravel in the bottom serves as a windbreak and safety measure (vent holes optional). Wire mesh can support a pot or pan to cook, boil water, etc.

Test it out. Boil some water, and enjoy a hot beverage!



14



15

Charcoal burn (after woodgas combustion ends**)



16



Make good use of the hot charcoal embers...toast some marshmallows!

CAUTION: Although these camp stoves generally burn cleanly and efficiently, they will produce **carbon monoxide** (CO) gas and some smoke (tars). CO output is highest during during the charcoal burn (#15). Carbon monoxide is a significantly toxic gas, but it is difficult to detect because it is colorless, odorless, tasteless, and non-irritating. After woodgas flames go out, there is typically a small amount of smoke produced for 30-60 seconds while the stove transitions to charcoal burning. New cans may also produce unpleasant fumes during the first firing. **Therefore, stoves should only be used outdoors with adequate ventilation. These stoves are not toys! Adult supervision required. Never leave any fire unattended.** We recommend using a CO detector & keeping a fire extinguisher on hand.

Gasification Reaction Zones in the Woodgas Camp Stove "Inverted Downdraft Gasifier"

