



BOY SCOUTS OF AMERICA

# HYCOTEE HERALD

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## February 2010

### What's New?

#### Belt Loops

The Boy Scouts of America is pleased to announce the introduction of 13 new belt loops and pins as part of the Cub Scout Academics and Sports program. It has been more than 10 years since new topics have been added to the program, which is supported by the Cub Scout Academics and Sports Program Guide, No. 34299.

Academics: Disabilities Awareness, Family Travel, Good Manners, Nutrition, Pet Care, Photography, Reading and Writing, and Video Games

Sports: Hiking, Hockey, Horseback Riding, Kickball, and Skateboarding

#### Merit Badges

Scouting's 100-year history has been marked by many changes in merit badges. Such badges as Cement Work, Farm Layout and Building Arrangements, and Interpreting bowed out long ago, while Climbing, Disabilities Awareness, and Nuclear Science have been added since the 1990s.

Now some new badges are coming. Scuba made its splash in December, and requirements are being developed for four more merit badges, all of which have been approved. Here they are along with the time they are expected to debut:

- ◆ Inventing, first quarter 2010.
- ◆ Geocaching, second quarter 2010.
- ◆ Scouting Heritage, second quarter 2010.
- ◆ Robotics, by end of 2010.

### Calendar

February - Is Scouting For Food Month

- 4..... Rockingham County Roundtable / Person County Roundtable -
- 6..... Cherokee District Merit Badge College  
..... Pinewood Derby Building Demonstration and Tips - Lowes:11am-1pm
- 8..... 100th Anniversary Celebration
- 13..... Scouting for Food Drop-off
- 18..... Cherokee District Committee Meeting
- 20..... Cherokee District Merit Badge College  
..... Pinewood Derby Building Demonstration and Tips - Lowes: 11am-1pm

March

- 4..... Rockingham County Roundtable / Person County Roundtable -
- 7..... 2010 Winterplace "Scouts on Skis"
- 13..... Person County Pinewood Derby Fun Run and Scout Show
- 18..... Cherokee District Committee Meeting
- 27..... Campership Sporting Clay Tournament @ CSR

April

- 1..... Joint Roundtable - Dutch Oven Cook-Off - Program - Scout Cooking
- 15..... Cherokee District Committee Meeting

## Use, Don't Abuse, your head

Here's a timely head's up that will keep your boys safer when they take part in this season's winter-sports activities.

The BSA has clarified requirements in a new rule about gear. "Appropriate personal protective equipment is required for all activities. This includes the recommended use of helmets for all participants engaged in winter sports such as sledding.... The use of helmets is required for the following activities: downhill skiing, snowboarding, and operation of snowmobiles (full-face helmets)."

Also, a reminder: Whenever units engage in winter sports, they should use only designated areas where rocks, tree stumps, and other potential obstacles have been identified and marked, cleared away, shielded, or buffered in some way. When choosing a helmet, Scouts should find one designed for recreational snow sports, not one meant for skateboarding or bicycling. And if you're heading to a ski resort, call ahead to determine if it has enough helmets to cover your group.

All that should turn the cold-weather activities into smooth sledding for everyone.



## Bugs in the System

Quick question: How many legs does a bee have?

If you found yourself hesitating before saying "six," you can empathize with the folks who designed the Bee Farming merit badge back in 1914. As you can see, the Scout Bee was a couple of legs short and stayed that way until 1939, when the correct version was designed for the now-discontinued Beekeeping merit badge.

Want more? For two years (1923-1925), the Insect Life badge featured a spider. But a spider is not an insect; it's an arachnid, which has eight legs and two body parts rather than the insect's six legs and three body parts.

When the Weather badge debuted in 1927, it showed a comet streaking across the night sky. But comets are not a weather-related phenomenon, so the weathervane replaced the comet.



## Misc. Cast-Iron Questions:

Never store food in the cast iron pan as the acid in the food will breakdown the seasoning and take on a metallic flavor.

Rust Spots - If your old or new cast iron pans gets light rust spots, scour the rusty areas with steel wool, until all traces of rust are gone. Wash, dry, and repeat seasoning process.

Goo or Guck in Pan - If too much oil or shortening is applied to a cast-iron pan in the seasoning process, it will pool and "gum up" when the pan is heated. In this case, the goo can be scraped off and some more grease rubbed over the spot, or the pan can be re-scrubbed and reseasoned.

Heating the pan upside-down may help prevent gumming but protect your oven by using a foiled-lined baking sheet or aluminum foil to catch the grease. Seasoning at higher temperatures, approaching the smoking point, of the oil used will result in darker seasoned coatings in less time that aren't sticky or gummy.

# Cast Iron Cooking

There are several reasons that people rave about their cast iron pans and cast iron skillets. Besides being an ideal heat conductor, cast iron cookware heats evenly and consistently, it is inexpensive and will last a lifetime (actually several lifetimes) with proper care, and it is an old-fashioned way to cook fat free. When well seasoned, a cast iron pan will be stick resistant and require no additional oil.

The benefits of cast iron pans and skillets are terrific: Foods glide out of it as from no pan made with Teflon; it goes from stove to oven; no special utensils are needed to cook in it; it won't warp, and cleanup is a cinch. A well-seasoned cast iron pan will only get better with age, and will last you for a lifetime. It's time people realize the culinary wonder that a cast iron pan can be!

Professional chefs consider cast iron cookware to be precision cooking tools, as these dependable pans enable precise control of cooking temperatures. Their heat retention qualities allow for even cooking temperature without hot spots. Cast-iron pans can be used on top of the stove or to bake in the oven. All our grandmothers had cast iron skillets and cast iron stove-top griddles. In fact, your grandmother swore by it and the pioneers depended on it.

If you don't own a cast iron skillet, it's well worth the time and money to invest in one. You can find them for sale on the internet, at cook stores everywhere, thrift stores, flea markets, or you can scour the tag and yard sales for one that might look as if it has seen better days. If the pan is rusty or encrusted with grease, buy it anyway. Don't worry! Read later how to get that new or old one into shape so you can enjoy it for a lifetime of fat free cooking. You'll be able to pass the pan on to your own children and grandchildren.

## History of Dutch Ovens:

The Dutch oven is believed to date back to the early 1700s in Holland. How and when it came to the U.S. is unknown but supposedly Paul Revere created the flanged lid and the final design of the oven. Some reports indicate that George Washington used Dutch ovens to feed his troops during the Revolutionary war.

As Americans moved west and expanded into the new world, the Dutch oven became a valuable commodity being a popular trade item with mountain men and Native Americans. As the United States expanded, this tool was taken along. When pioneers, homesteaders, miners, and ranchers moved west, the Dutch oven was one of their most valuable items especially since entire meals could be cooked in them. Records show that Lewis and Clark cooked wild game as well as dog and horse during their trek to the west coast. Another common use was during cattle drives, drive cooks fed the famous beans and stew to the cowboys during the long cattle drives.<sup>1</sup> The famous 49ers in California commonly used the Dutch oven to make sourdough bread. Likewise soldiers used it for cooking during the Civil War.

In 1896 Joseph Lodge built a cast iron foundry in Tennessee. The best known product from this foundry was the Dutch oven. Lodge still produces this well known product today and is currently the leading producer of the cast iron Dutch ovens.

Another place the Dutch oven appeared is in the work camps following World War I. However, the popularity of the product waned. A renewed interest began in the 70s and 80s with a cook off contest. In fact, the Dutch oven became popular enough that the International Dutch Oven Society formed in 1984 and Utah made the Dutch oven the cook pot of the state in 1997.

## Bean Pots

Kitchen, stove, or bean pots have these features:

Flat bottom with no legs which are good for using on wood burning stoves.

Lid may be domed or have spiked nodes for basting

Generally the kitchen (stove/bean pot) version of the Dutch oven works best on the stove at home, on a propane burner, or hanging from a tripod. However if you have a couple of bricks, you can place the oven on them and coals underneath.



## Dutch Ovens

Camp or outdoor Dutch ovens have the following features:

- ★ The camp or outdoor Dutch oven is the preferred oven for outdoor and campfire cooking.
- ★ Flat bottom
- ★ Three short legs which allows the oven to be above the ground to allow the circulation of air onto the coals
- ★ Strong wire handle which may have the option to stand up at a 45 degree angle. By having the handle stand up it will give better access when positioning or removing the oven from the fire
- ★ Flat lid with a lip of 1 to 2 inches; the lip allows you to place hot coals on top of the oven or can be used as a frying pan
- ★ Small loop handle on lid, make sure it is attached at both ends to make it easier to lift off with a hook.
- ★ Skillet type handle attached to the lid which helps when using the lid as a griddle or fry pan.

Size of ovens range from 5 to 22 inches in diameter for the rim. Depth is around 3 inches but some can be as deep as 9½ inches with the larger diameters. Remember that the larger the oven the heavier it will be when it is full of food. A 12-inch Dutch oven full of food can weigh as much as 25 pounds

## Purchasing A Dutch Oven:

New, the Dutch oven can be very costly. If you check junk shops, rummage sales, or thrift stores you might be able to save yourself a lot of money. However, make sure you are getting a good quality Dutch oven. If buying a used Dutch oven here are a few things to look for:

- ➔ Cracks, chips, casting imperfections and rust spots
- ➔ Examine the pot and lid both inside and out
- ➔ Make sure the lid fits properly
- ➔ Make sure there is no rocking motion when the lid is on the pot
- ➔ Make sure the lid does not fit too tightly on the pot
- ➔ Check the wire bail for strength and that it moves easily

If looking for a camping pot, then only buy a Dutch oven with legs and determine that these are in good condition

Check the thickness of the metal – inconsistencies will mean inconsistencies when cooking

Make sure there is a loop handle which makes it easier to pick up with a hook

Avoid ovens with riveted tabs

If you have purchased a ready to use Dutch oven follow these steps:

- ◆ Before using for the first time rinse with hot water but no soap, and towel dry
- ◆ Before each time cooking, prepare the cooking surface by wiping it down with vegetable oil
- ◆ After each time cooking, clean with a stiff brush under hot water with no soap and towel dry
- ◆ After it is dry and while still warm, wipe all surfaces down with oil
- ◆ Allow the oven to cool and then store in a cool dry place, do not store with the lid on top

## How To Use and Care For A Dutch Oven:

You've conquered the cooking aisle or the rummage sale and come home with the prized Dutch oven. So what's next? Well whether you purchased an aluminum or cast iron oven most manufacturers put a protective coat on the item. Before you begin cooking, this coating needs to be removed. Also if you inherited or purchased a used Dutch oven it will need to be seasoned.

If your oven is aluminum you only have to do one simple step – wash the oven in soap and water. This should remove any coating. However, if you treat the aluminum pan like a cast iron and season it (see steps below) then the oven will have almost a non-stick surface.

Prior to seasoning, wash the Dutch oven with warm water. Some experts suggest that when an oven is new is the only time you should use soap. Most experts; however, suggest only using a good scrubbing with steel wool and some elbow grease. For a cast iron oven, you need to follow a seasoning process. Aside from removing the protective coating, there are many reasons to season your cast iron Dutch oven. Here are a few:

- ★ Creates a patina which helps prevent food from sticking
- ★ Makes cleaning easier
- ★ Prevents rusting
- ★ Add flavor
- ★ Oil forms a carbon non-stick coating when heated

There are four methods to season a cast iron Dutch oven, one indoor and three outdoor methods:

### Indoor method - 1

- ★ Preheat oven to 350° F.
- ★ Open windows and turn off the smoke alarm
- ★ Place pot and lid in oven and heat until they are almost too hot to handle
- ★ Remove pot and lid from oven
- ★ Use paper towel to rub a thin layer of oil (can use olive or vegetable oil or solid shortening – do not use margarine or butter.
- ★ Avoid using spray oil as it may leave a sticky residue

- ★ Cover all surfaces including legs
- ★ Place pot and lid on top rack of oven
- ★ Put a cookie sheet on the lower rack to catch any run off and prevent oven from catching fire
- ★ Bake for one hour
- ★ Turn off the oven and let pot and lid cool in the oven.
- ★ Repeat the process
- ★ Remove the pot and lid from oven and wipe with clean dry cloth

Note: if you have a fireplace in your home, you can use this to season your oven. Its best to have a hook in the fireplace. If the chimney flue has a good draw, it can minimize the grease smoke in the house.

### Outdoor method A

- ★ Use your oven as a deep fryer to fry fish, hush puppies and fries
- ★ Once done cooking pour oil out and wipe pot with paper towel

### Outdoor method B

- ★ Fry thick sliced unsalted bacon on the lid and in the pot

### Outdoor method C

- ★ Using a propane gas grill with a cover turn grill on to low and place the Dutch oven in the grill to preheat
- ★ When warm wipe on a thin layer of oil
- ★ Place lid and oven in the grill and lower the lid
- ★ Cook for one hour
- ★ Repeat the process
- ★ Remove and wipe with clean dry cloth

Note: this can be done with a charcoal grill as well but be careful not to overheat the Dutch oven

Regardless of the methods used to season the oven, it will darken with use. This is preferred as it is an indication of a well seasoned oven. Also these seasoning techniques work for any cast iron cookware hiding in the back of your cabinet.

When seasoning an oven do not use butter, margarine, or salad oil. Additionally for the first

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few meals after seasoning avoid cooking high acid content dishes or high sugar content after seasoning. The acid and sugars can break down the seasoning before it has a chance to properly harden.

If you don't want to go through the steps of seasoning your pot then you can usually buy one which is preseasoned. Bear in mind though, these are usually more expensive.

### **Hay and Water**

Here is one additional method which is a bit different that uses hay and water to season the Dutch Oven:

- ★ fill Dutch oven with water and a handful of clean hay
- ★ boil for 20 minutes
- ★ rinse

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If the food cooked in the Dutch oven is black food or has a metallic taste indicator of one of two things:

Dutch oven not properly seasoned

Food was left in the pot after cooking

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## **Old North State Council, BSA**

The Feb./March issue of "The Old North State News" has been posted to the Web site.

The Jan./March issue of "The Safety Zone" Newsletter is available on our Web site.

The Old North State Council will be offering a Hunter Safety Course as part of Old North State University. The course will be held Friday, Feb. 19th from 6-9 PM and Saturday, Feb. 20th from 8 AM - 6 PM. This 10 hour course is required to purchase a NC Hunting license and to qualify for the parent/son shooting events held at the Cherokee Shooting Clays Course.

Other classes that will be offered at Old North State University on Saturday, Feb. 19th include First Aid and CPR, Boy Scout and Cub Scout Paperwork, Venture Leader Training, Scouting Software and online resources and more. Don't miss this great training opportunity to learn more about being a better leader in Boy Scouts!

Hope to see everyone at the Birthday party on Feb. 8th at Newbridge Bank Ball Park in Greensboro as we celebrate 100 years!

For more information on these items listed above, visit our web site at [www.bsaonsc.org](http://www.bsaonsc.org) or give us a call at 336 378-9166.

## Clean up and Care of Dutch Ovens:

The meal is over and hopefully has been a great success. However, just like any other meal, clean up comes next. If you've purchased and used an aluminum Dutch oven then you can wash it as you would any other dish. If you have used a cast iron Dutch oven, follow these steps:

### ◆ **Remove food**

- ◆ some say never use soap and others say only MILD soap
- ◆ if food is stuck fill partially with clean warm water and bring to a boil
- ◆ if needed use a plastic scouring pad or brush
- ◆ Never pour hot water into a cold oven or cold water into a hot oven as this may crack the oven
- ◆ once all food is gone rinse with warm water
- ◆ dry quickly to prevent rusting either with a towel or place on heat (there's a reason grandma kept her cast iron in the oven

### **Oil:**

- ◆ coat entire Dutch oven and lid – all surfaces with a light coat of oil
- ◆ do not use lard
- ◆ mineral oil is good if it will be stored long term

When cleaning your Dutch oven there are a few things you definitely **do not want to do**:

- ◆ Never use strong soap or harsh detergent
- ◆ Never use metal scouring pads, scrapers, or clean in a dishwasher
- ◆ Never allow cast iron to sit in water as this will cause rust
- ◆ Never use soap as it may get in the pores and food may taste soapy
- ◆ Never place an empty Dutch oven in a fire as it will crack and warp
- ◆ Never be in a hurry to heat as this can cause food to burn or damage the Dutch oven
- ◆ Never put cold liquid in a hot cast iron oven, it could crack

Some experts feel soap will break down the seasoning, get in the pores, and cause a bad taste in food. Additionally soap won't necessarily help clean the Dutch oven. If you've cooked sticky, sugary food in the Dutch oven then place water in the Dutch oven and bring it to a boil to clean. When scrubbing you can use almost anything abrasive like oak leaves, scrub brush, sand, or salt. If the pan is still hot be careful not to burn yourself. One way to avoid an extremely dirty Dutch oven is to line the inside of the oven with foil. If despite your best efforts the Dutch oven still doesn't come clean then place it in the fire and let the stubborn food burn away. Unfortunately this means you will need to reseason your Dutch oven.

Between uses keep the oven in a dry place to prevent rusting. Also try to prevent dust from accumulating. Do not store with the lid on tight. This prevents the interior from rusting and the oil from turning rancid. One technique is to use a few sheets of paper towel folded or a small roll of aluminum foil to keep the lid ajar. Another technique is to wrap a small piece of real charcoal, not the briquettes, in a paper towel. This absorbs odor and moisture from the Dutch oven.

If rust has damaged the Dutch oven, here are some techniques to get rid of it:

- ◆ use a steel wool or wire brush to clean it off. Once the rust spot is gone you need to re-season your pot.
- ◆ Soak in Coca cola for a couple of hours before you scrub with a wire brush
- ◆ Set the self cleaning oven to clean for 2 hour and let it be. Allow the oven to cool completely before removing the Dutch oven.

Campfire cooking or grilling out does not need to be hot dogs on a stick. With the right tools and a bit of practice you can create almost any meal you would have off your stove. The Dutch oven is a versatile tool to use in creating these outdoor meals.

## Using Charcoal Heat:

Now you know what and how you can cook but there is one more key component to cooking with a Dutch oven. What will be your heat source? With a kitchen style Dutch oven you can use your stove or oven at home as well as a grill or propane burner. With a camp Dutch oven you can use a campfire of wood or charcoal.

Cooking with charcoal can be in a grill, at a campfire site, or even in a backyard fire pit. In my backyard I have a small metal fire pit, which my family often sits around with a wood fire going. So when I tried Dutch oven cooking, I used charcoal in my fire pit and had good success.

If you opt for charcoal remember to leave room for the bag in your gear. Here are a few advantages of using charcoal:

- ★ burns longer and more evenly
- ★ starts easier especially with a chimney
- ★ easy to transport
- ★ easy to cleanup after

Charcoal can be arranged in a variety of patterns. You want to avoid bunching of the briquettes as this will cause hot spots in your cooking. Here are three possible patterns:

- ★ checkerboard pattern under oven and on lid
- ★ circle pattern under oven and on lid
- ★ circle under oven and checkerboard on lid

Obviously when working with any kind of fire there are hazards. Here are a few safety tips for working with charcoal:

- ★ never burn in homes, buildings etc due to odorless toxic fumes which may accumulate
- ★ never use gas to light
- ★ do not add lighter fluid to burning or hot coals
- ★ cook away from overhanging roofs or limbs and flammable items, away from children and sports activities

Follow this formula for temperature control:

- ★ Take the size of the Dutch oven and add 3 more to the top and subtract 3 for the bottom
- ★ This maintains a steady temperature of 325 – 350 degrees F.
- ★ Note: 2 coals = 25°

Wind, food type, and outside temperature can affect the temperature when cooking. Cool air temperatures, high altitudes, shade and high humidity will decrease the amount of heat generated by briquettes. Hot air temperatures, low altitude, direct sunlight, and wind will increase the amount of heat generated by briquettes. Additionally the more metal, volume of food, and internal air space you have to heat up the more heat will be required to bring your oven to the desired temperature. If you are in a hurry or short on coals you can cover the Dutch oven with aluminum foil to help keep the heat focused.

## Using Wood Heat:

Using wood as a heat source takes a bit more skill. When cooking on an open fire, you need to watch your food carefully since these can have hot spots. You can use a fire ring which can produce good coals. A keyhole design is another way to get coals from a wood fire. The fire is built in the round part and hot coals are pulled into the rectangular section for cooking. With all these formats you may need a cooking platform in order to provide a flat dry surface.

Material is very important when cooking on a wood fire. If the wood burns quickly to ash it is difficult to get coals for cooking with the Dutch oven. **Soft woods** tend to burn hot and fast. Using soft wood often results in burned food on the outside while the inside remains raw. As they don't produce hot long lasting coals, some woods to avoid are:

Poplar, Cherry, Elm, Aspen, Birch, Gum, Yarrow – take special care to avoid this wood as cooking with it will make you sick

**Hardwoods**, when burned, hold heat better.<sup>5</sup> Some woods to use are:

- ★ Mesquite
- ★ Hickory
- ★ Oak

One advantage of wood, depending on where you are camping, is that at most campsites it is readily available. Some woods, hickory and mesquite in particular, can add flavor to the meals. Here are some hints to make this style of cooking easier:

- ★ start early – hardwoods burn slowly so start the fire well ahead of time to start cooking
  - ★ tools – long handled shovel, whisk broom, supply of firewood
  - ★ try to get the same size coals
  - ★ don't heap coals
  - ★ don't bury the Dutch oven in the campfire
  - ★ turn the Dutch oven  $\frac{1}{4}$  turn every 15 minutes or  $\frac{1}{3}$  turn every 10 minutes and turn the lid in the opposite direction
  - ★ replenish coals regularly
  - ★ avoid high flames except to clean the oven
- Here are two helpful hints for cooking with either charcoal or wood:

- ★ If twice as much heat on top is needed then just have twice as many pieces of charcoal on top as are on bottom – this is not as easy to control if using wood
- ★ Estimate heat of oven – place your hand about 6 inches over the coals on the lid and count one thousand one; one thousand two; one thousand three... remove your hand when it is uncomfortable – one is hot, two is moderate, and three is low heat – more you are just warming food not cooking

## Using a Dutch Oven

In a single Dutch oven, you can perform deep and shallow frying, roasting, baking, boiling, stewing, simmering and steaming. Use these quick hints for each heating method:

**Deep fat frying** - all heat should come from bottom – place coals all underneath

**Shallow frying** - all heat should come from bottom – place coals all underneath

**Roasting** – heat source should come from top and bottom equally – place coals under and on top in a 1-1 ratio

**Baking** – usually done with more heat on top – under and on top ratio of 1 – 3

**Boiling** – all heat should come from bottom – place coals all underneath

**Stewing** – almost all heat from the bottom - under and on top ratio should be 4 - 1

**Simmering** – almost all heat from the bottom - under and on top ratio should be 4 - 1

These are a few general hints for temperature control based on the type of dishes:

- ▲ Liquid dishes – (soups and stews) more heat on bottom ( $\frac{2}{3}$  of coals) and less on top ( $\frac{1}{3}$  of coals)
- ▲ Meat, poultry, potatoes, veggies, cobblers – equal distribution
- ▲ Cakes, breads, biscuits and cookies –  $\frac{2}{3}$  on top and  $\frac{1}{3}$  on bottom
- ▲ Bread is a nice addition to any meal. This may seem impossible to do but actually is quite simple. Many stews, soups, and chili adapt well to biscuits or dumplings on top.

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Here are some hints for making your bread baking experience better:

- ▲ When done take the bread out of oven to prevent overcooking and to keep the bread from getting soggy
- ▲ Many recipes call for floured baking – this flour coating will burn but the bread should be fine and cleans up fairly easy
- ▲ Roll biscuits in oil to get them brown on both sides

#### **Cooking bread:**

- ▲ Put a light coat of oil on the interior of a cool oven including the lid and let the bread/rolls finish the last rise in the pan prior to applying coals
- ▲ Place the oven on the coals with 2/3 of the coals being placed on top
- ▲ When there are 5 to 8 minutes left, lift the lid and butter the top of the bread, place all the coals on top of the oven, then check every couple of minutes to see if it is done

#### **Desserts:**

After a long day of being outdoors, you build up an appetite. One of the best parts of most meals is dessert. Desserts can be made in a Dutch oven, one of the recommendations is to use a pan inside the Dutch oven like a small 8-inch round aluminum cake pan. This puts the sugar in the aluminum cake pan and makes clean up much easier. It helps prevent the cast iron Dutch oven from losing its seasoning

#### **Bean Hole Cooking**

Bean hole cooking dates back to at least colonial times. Follow these steps:

- ▲ Dig hole (side of knoll so can have open for raking)
- ▲ Line with stones
- ▲ Build fire in and above hole and keep going till stones are hot
- ▲ Rake out coals and ash
- ▲ Put in Dutch oven which must have a tight lid

- ▲ Cover with ashes, live coals, and dirt
- ▲ Close mouth of hole with flat rock

#### **Crock Pot Cooking**

Somewhat similar, crock pot cooking uses these steps:

- ▲ Dig a hole 18 to 20 inches deep and 20 to 24 inches in diameter in the center of the campfire
- ▲ Line the sides of the hole with flat stones and check to make sure the oven will fit in the hole
- ▲ Start a campfire in the bottom of the hole to get coals going
- ▲ Keep adding wood to the fire until it is 1/2 to 2/3 full of coals.
- ▲ Kick the fire out and remove the larger pieces of wood
- ▲ Dig a hole in the coals that the Dutch oven containing the evening meal can be set in
- ▲ Cover the Dutch oven with the remaining coals 2 to 3-inches of coals on top of the lid followed by 2-inches of dirt spread over the coals
- ▲ Spread wet burlap bags over the dirt and cover them with rocks so they don't blow away
- ▲ Leave the oven to sit for the day
- ▲ Dig out the oven and the food should be ready
- ▲ Lift out the oven and brush it off with a whisk before opening

#### **Hints**

Here are some hints for making your Dutch oven cooking experience more successful:

- ▲ May want to brown meat at home and freeze it – then just heat it up at the camp site
- ▲ Prepare dry mixtures in zip lock bags ahead of time – write mixing directions on the bag and use the bag as a disposable mixing bowl
- ▲ Fajita spice and cinnamon are magic spices and can be used in almost anything

# Building a Faster Derby Car

## Friction is Your Enemy

for Pinewood Derby - a derby is a lot of fun, and it's a great opportunity for learning and for making memories.

This document describes ways to make a derby car faster.

I must begin this document with a disclaimer: My experience building fast derby cars is limited. I typically invest most (if not all) of my effort in the appearance of my derby cars. However, I believe that my background in physics and engineering has enabled me to evaluate accurately the information I have accumulated from those who do have experience building fast derby cars.

No amount of work can guarantee a winning car; I have seen many carefully optimized cars that didn't do well on race day. On the other hand, I have seen derbies won by cars that were built haphazardly, so it seems that a minimal effort does not assure a losing car either.

With that said, here are some ways you may be able to improve the speed of your derby car.

### Obey Your Derby's Rules!

This is the most important advice I can offer. If you break one of your derby's rules and your car is disqualified, it doesn't matter how fast it is. Some of the suggestions that follow are illegal in many derbies, including derbies that I have helped organize. Ignore any speed tips that violate the rules for your derby.

### Make Sure Your Car Fits the Track

Two common sources of trouble are (1) wheels that are too close together, and (2) too little clearance under the car for the center guide rail. If its wheels pinch the center guide rail, or if its bottom drags on the center guide rail, then your car may not even reach the finish line. The original kit dimensions should fit the track; don't reduce them!

Unusual designs can encounter other track-fit problems. As a rule, if the basic shape of your design is unusual, check with whoever sponsors the race to see if it will work with the track's starting gate, finish gate, guide rail, etc.

Yes, aerodynamics can make a difference. Yes, getting your car as close as possible to the weight limit can make a difference. Yes, other things can make a difference too. But friction is the most significant force slowing your car down, so reducing friction is the most important thing you can do if you want a faster car. Friction occurs between the wheels and axles, between the wheels and car body, and between the wheels and center guide rail. This is where you need to reduce friction.

### Experiment Together

Don't forget that the derby is supposed to be a father-son (or adult-child) activity. Set up a long board on a slight incline and experiment together until the car rolls straight down the board as quickly and as smoothly as possible.

You can also test axle alignment this way. With perfect axle alignment, you can start the car with its wheels pushed in (against the car body) or with its wheels pushed out (against the axle heads) and they'll stay that way as the car rolls down the incline.

### Keep Wheels & Axles Straight

Crooked axles will cause your car to ride the center guide rail, or will cause the wheels to slide in addition to rolling. In either case, the extra friction will slow your car down. Keeping your wheels and axles straight is probably the most important step in building a faster car.

The time to think about keeping your axles straight is before you start shaping your car. It is much easier to create straight holes for your axles when the sides of the block of wood are still square, than after you have shaped your car. Later, when you've finished shaping and painting your car, the axles will fit easily into these holes, and your wheels and axles will be straight.

One obvious technique for creating straight axle holes is to pre-drill them with a drill press. If you use a bit that is slightly smaller than the axle nails in your kit, then you may not need glue to hold your axles in place and you won't have to worry about the axles wobbling in oversized holes.

In our derby workshops, we use a variation of this technique. Instead of a drill bit, we use an axle nail with the head sawn off. Without turning on the drill press, lower the axle nail straight into the block of wood. If you don't have access to a drill press, you can clamp an axle nail in a pair of pressure pliers (e.g., Vice-Grips), and carefully insert the axle nail straight into the pre-cut axle slots.

### **Polish the Axles**

This works best if two people work together. Lock an axle into the chuck of a hand drill, leaving the head of the axle plus about 1/2 inch of the axle itself sticking out. While one person holds the drill and turns it on, the other person should polish the exposed axle with a thin strip of wet emery paper. Polish both the axle shaft and the inside of the axle head. Keep the emery paper moving to avoid creating grooves in the axle. For an even better polish, you can use steel wool, metal polish, and/or jeweler's rouge after an initial polishing with emery paper.

Examine the axle closely (with a magnifying glass, if possible). It should be perfectly smooth. Test the axle by inserting it through a wheel and spinning the wheel with your finger. The wheel should spin smoothly and slow down very gradually.

### **Prepare the Wheels**

When you get your wheels, they may have irregularities left over from the casting process (e.g., a peg-like sprue or paper-thin flash). You should remove these irregularities, and then carefully sand any remaining roughness with emery paper. Metal polish can restore the glossy finish to your wheels.

Commercially available mandrels allow you to spin your wheels with a hand drill (this is similar to the axle-polishing technique described previously). This can be a big help in removing fine irregularities, but be careful not to reshape or damage your wheels. Make sure the wheel is secure within the mandrel; if the wheel rotates on the mandrel you'll overheat and melt its plastic hub, completely ruining the wheel.

Be careful to avoid reshaping your wheels in any other way, or you may disqualify your car!

### **Lubricate the Wheels**

Various lubricants are available from hobby shops. The standard derby lubricant is graphite powder, which is good, but can be messy (especially when used in excess). Penetrating oils (e.g., WD-40) can also work well. Some people recommend talcum powder (baby powder), or high-tech lubricants with Teflon, silicone, or molybdenum sulfide. Some liquid lubricants can get sticky though, so test them before using them on your car. Some derbies restrict which lubricants you can use, so check your derby's rules.

I've found that the best way to lubricate the wheels is to apply the lubricant to the inside of the wheel hub first. Once the wheel is lubricated, insert the axle through the hub and mount the it on the car. If the wheel is mounted first, it's very difficult to get lubricant between the wheel and the axle.

Avoid mixing lubricants, and especially do not mix dry lubricants with wet lubricants. The result is often a sticky mess.

### **Don't Bind the Wheels**

If you push the axles in too far, the wheels will bind against the sides of the car. Leave a little room for the wheels to move sideways, along the length of the axle.

### **Paint Early, Paint Often**

This sounds like an appearance suggestion, but it is also a speed suggestion. Paints and finishes that haven't cured completely tend to be slightly tacky, and then stick to the wheels and slow the car down. Leave yourself time to apply your final finish coat well in advance of the actual race, so that it will finish curing before you put your wheels on. Also, a single heavy coat will take longer to dry and cure, so be sure to apply several light coats instead.

### **Low-friction contact**

Here are two other ways to create a low-friction contact surface where the wheels touch the car body.

Keep the contact points of the car body completely clean. Before painting the car body, mask these locations. Use a circle of paper held in place by masking tape; the circle of paper protects the wood from picking up adhesive from the masking tape.

Before mounting the wheels, rub graphite into the paint at the contact points. With reasonably well-cured paint, this technique replaces any residual tackiness with a dry lubricant. Be careful not to spoil the paint on the rest of the car though; graphite creates ugly black fingerprints.

### **Reduce Air Resistance**

Fancy aerodynamic styling doesn't improve a car's speed significantly, but air resistance is still an important factor. To reduce air resistance, design your car low to the ground. A smaller cross section will create less air resistance.

### **Weight Your Car Well**

Heavier cars are faster than lighter cars, so try to get your car as close to the maximum weight as possible. It's a good idea to plan for a way to adjust the weight on race day. That way you can add as much weight as possible, or you can remove excess weight without risking significant damage to your car. If you plan ahead, you can create a way to add small metal objects (e.g., screws, BBs, coins, fishing weights) to your car on race day.

Weight distribution matters, too. I believe that the front end of your car needs to move easily so it can correct its course easily when it hits the guide rail. Your car's weight distribution determines how easily its front end can move.

Make the unweighted car body as light as possible, and keep the lead weight as compact as possible. This reduces the rotational inertia of your car.

Put the lead weight just in front of the rear axles. If the weight is behind the rear axle, your car's front wheels will tend to bounce. This bouncing will slow your car down, and it might even cause your car to derail and leave the track.

The exception to this weight-to-the-rear design is if your race uses a track that gets steeper right after the starting gate. On such tracks, the weight should be forward (just behind the front axles) so your car will accelerate more quickly in the beginning.

### **Four Wheels Good, Three Wheels Better**

It takes less energy to make three wheels roll, than it does to make all four wheels roll. Keep the center of gravity towards the rear, so you can leave one of the front wheels slightly higher than the other. Then your car will roll on three wheels (one front and two rear wheels) instead of rolling on all four wheels.

I've also heard of cars built so that they balance on two diagonally opposite wheels (e.g., left front and right rear). The two remaining wheels will occasionally touch the track, but the car's weight is carried primarily by two wheels. This may be a case of "Three Wheels Better, Two Wheels Best".

### **Lengthen the Wheel Base**

If your derby rules allow it, lengthen the wheelbase as much as possible. In the races I've seen, long-wheelbase cars have done very well.

You should also reduce the amount of the wheel surface that contacts the track. Shape the running surface of the wheel so that it is angled, leaving a narrow edge that will contact the track.

### **Paint It the Right Color**

It won't fool an electronic finish line, but I've heard that human judges tend to err in favor of red cars when the race is close. It can't hurt. . .

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Level 2

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Level 3

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Level 4