



Home Brewing 101

Overview of how easy it is to make your first beer.
From buying your first extract kit, to pouring your first glass of home brew.

Skills you need:

1. Can boil water/work with hot liquids
2. Can lift 5 gallons of liquid
3. Can follow a recipe
4. Able to clean equipment
5. Have the time to do it.
6. Of legal drinking age.

Steps:(5-6 weeks)

1. Brew Day: Prepare wort (barley + hops+ water) (~4 hours for extract brewing)
2. Fermentation: Pitch yeast - let it make beer(~3 weeks)
3. Packaging Day: Bottle the beer (2-4 hours)
4. Wait, and then serve. (2-3 weeks)

What is in your first kit:

- ✓ **Extract:** pre-made wort (mashed grains, boiled, concentrated)
- ✓ **Hops:** for bittering, flavor, and/or aroma
- ✓ **Specialty grains/grain bag:** adds flavor, and color
- ✓ **Yeast:** converts sugars into alcohol and CO2 - makes the beer
- ✓ **Priming sugar:** carbonates the beer
- ✓ **Bottle caps** – for bottling

Brewing terms:

- **Wort:** sweet liquid that yeast will make into beer. Brewers make wort, yeast makes beer.
- **Gravity:** Measurement of sugars in the wort.

(1) Brew Day: Clean all equipment; steep grains, start boil, add hops/extract per instructions, add remaining water, chill to 65F. Sanitize fermentation equipment, and transfer to fermenter.

What you need: 4+ gal brew pot cleaner, and sanitizer good water thermometer
 a beer kit! 6 gallon fermenter means to boil/chill wort long spoon notebook

(2) Fermentation: Measure gravity, prepare/pitch yeast and stir. Store in temperature (60-68F) stable area; let yeast make beer (about 3 weeks). Check gravity to see if done. Calculate alcohol by volume (ABV).

What you need: patience hydrometer/test jar air lock

(3) Packaging Day: Clean/sanitize bottles/caps/equipment. Prepare priming sugar; rack beer into bottling bucket (no splashing, leave sediment behind). Stir gently. Fill bottles to about 1 inch from top and cap. Place bottles in temperature stable (65-72F) area to allow natural carbonation.

What you need: cleaner, and sanitizer bottling caps bottle brush capper
 bottling bucket long spoon bottles racking setup

(4) Wait & Serve: After 2 weeks, sample a beer, if carbonated enough, get friends/family to enjoy!

Note: This is an overview – follow the instructions with your beer kit.

Recommended reading. “How to Brew”, by John Palmer; AHA’s Zymurgy magazine.

Presenter: Dan Schreffler, Wyoming Valley Home Brewers (beer@solarrat.com)

Brew & Drink Responsibly!



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Brew Day

Equipment, steps, and tips for making, boiling, and chilling your wort. All grain, partial mash, and extract.

Skills you need:

1. Can boil water
2. Can lift 5 gallons of liquid
3. Can follow a recipe
4. Able to clean equipment
5. Have the time to do it.
6. Of legal drinking age.

Steps:

1. Clean all equipment, gather ingredients
2. Prepare wort (all grain, partial mash, or extract)
3. Boil wort
4. Add hops, other ingredients per recipe
5. Chill wort
6. Transfer to fermenter

What you are doing? Creating the wort that yeast are going to consume to make beer.

What you need: cleaner, and sanitizer good water thermometer long spoon
 6 gallon fermenter boiling/chilling equipment dependant on wort choice

(1) Assemble and clean equipment, gather your ingredients

- a. Make sure you have all your gear prior to starting the brew day, and that you have it cleaned. Items that will be working with hot wort prior to chilling only need to be cleaned. Items that will be used after chilling need to be sanitized.
- b. Check your ingredients list – if a kit, double check the recipe with items in the box.
- c. It is always good to know the location, hours, and phone number of the local homebrew store in case missing an item. Easier to do before you fire up the burner.

(2) Prepare wort (all grain, partial mash, or extract)

	<u>Extract</u>	<u>All Grain</u>	<u>Partial Mash</u>
Steps	Add can of extract to boil water	<ol style="list-style-type: none"> a) Mill the grains b) Mash the grains with hot water in mash tun. c) Rest the mash (152F for 1 hour) d) Lauter – drain the wort into the boil kettle e) Sparge – rinse the grains with hot water from the HLT to extract more sugars 	<ol style="list-style-type: none"> a) Similar to all-grain, but we will use only 2 pots b) Place milled grains in grain bag, and add to heated mash water. c) Rest 60 minutes at 152F d) Lift grain bag, drain, and place in boil pot with heated water (165F) e) Rest for 10 minutes f) Remove grains, drain and add water from the mash pot. g) Add can of extract
Equipment differences	<input type="checkbox"/> Boil pot (4-5 gallons) <input type="checkbox"/> Stove top to heat/boil	<input type="checkbox"/> Boil pot (8-10 gallons) <input type="checkbox"/> Mash tun – vessel to hold water/grain and retain heat. A means to separate grains from liquid and drain out. 10 gallon cooler a good option <input type="checkbox"/> Hot liquor tank (HLT) – a pot that can heat 4-5 gallons of hot water for sparging <input type="checkbox"/> Propane burner to boil large volumes <input type="checkbox"/> Gravity or pumps to move liquids.	<input type="checkbox"/> Boil pot (5 gallons) <input type="checkbox"/> Mash pot (4-5 gallons) <input type="checkbox"/> Nylon grain bag <input type="checkbox"/> Stove top to heat/boil
Advantage	Less equipment, complexity, time	Full control over the recipe, and wort freshness.	Use grains not possible with extract only. Less equipment / time than all-grain.

(3) Boil wort

Extract brewer:

- Per recipe, steep grains before the boil. Bring 1 gal/lb water to 160f, add grain bag and steep for 30 minutes (or per kit recipe) no hotter than 165F. Remove grains and bring to boil.
- Turn off heat, add extract per recipe. Be sure to keep stirring extract until fully dissolved to avoid scorching. Return to boil

All brewers:

Watch for boil over's. Wait for foam to stop forming (hot break), and then you can partially cover the pot. Do not fully cover, as you want to allow compounds that can create off flavors to boil off. Did I mention to watch for boil over's

(4) Add hops, other ingredients per recipe

Timing of hop additions matter. Bittering, flavor and aroma aspects increase/decrease due to boil time so follow the recipe.

(5) Chill wort.

- Sanitation is vital at this point. Watch nothing gets into your brew pot that has not been sanitized; watch for drips from your hands, etc at this stage.
- Temperature is a very importance part of brewing as it affects yeast, and yeast makes beer! You want to get your wort temperature to a couple degrees under pitching temperature as quickly as possible.

Extract/partial mash:

Can use an ice bath and when wort is about 70F, transfer to fermenter, and add cool (60-64F) water to reach target volume of ~5 gallons, or target OG. Can also use ice from water you boiled and stored in a sealed sanitized container. No commercial, bag ice.

All grain:

You will need some type of wort chiller to reduce temperature of the full 5+ gallons. Immersion, plate, and counter flow are the options. It is extremely important to clean/sanitize these.

(6) Transfer to fermenter.

Extract/partial mash: pick up pot and pour into bucket.

All grain: given volume, use drain value on boil pot; gravity or pumps.

Leave the trub, (hop, break and other material) which has settled in the brew pot. Splashing is good as it helps to aerate the wort.

Note: With all things brewing, there are many opinions on the "right way". This is a general approach I follow. Your mileage will vary, so temper this with instructions with your beer kit, and what you learn along the way.

Brew & Drink Responsibly!

Recommended reading. "How to Brew", by John Palmer; "Brewing Classic Styles", by Jamil Zainasheff/John Palmer; AHA's *Zymurgy* magazine.

Presenter: Dan Schreffler, Wyoming Valley Home Brewers (beer@solarrat.com)



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Yeast Makes Beer

Fermentation equipment, steps, and tips from yeast pitched to beer made.

Skills you need:

1. Can clean and sanitize
2. Can control temperature of wort
3. Patience.

Steps: (~3 weeks)

1. On Brew Day
 - a. Prepare yeast
 - b. Chill wort to pitching temperature
 - c. Measure wort gravity (OG)
 - d. Pitch yeast and aerate wort.
2. Fermentation: wait - let it make beer (~3 weeks)
3. Check gravity to see when fermentation completed (FG)

What you are doing? Letting the yeast do their job of making beer by keeping them healthy.

What is yeast, and the types?

Yeast is a living microorganism that converts malt sugars to alcohol and CO₂. Your first kit will include dry, ale yeast, match to the style you are brewing.

Yeast forms:

- Dry - convenient and stores well; but drying process tough on cell viability.
Liquid - offers more varieties, but is more sensitive to temperature and storage time.

Yeast types:

- Ale - top fermenting, complex tastes/aromas, fermentation/aging time in weeks; ~68f;
Lager - bottom fermenting, clean or malt flavor/aroma, fermentation/aging time months; ~53F

Yeast strains: Many! Clean, fruity, phenolic, funky. Little flavor impact as in an American wheat to the banana/clove in a German wheat;

(1) Brew Day:

What you need: cleaner, and sanitizer thermometer 6 gallon fermenter
 hydrometer/test jar air lock and/or blow off

- a) Prepare yeast - bring yeast to room temperature. While dry yeast can be sprinkled on top of the wort, the yeast manufacturer usually recommends hydrating in small amount of warm (90-100F) water, and waiting 10 minutes before pitching.
- b) Chill wort to pitching temperature - important as high temperature can lead to off flavors. Ice bath, wort chillers are options.
- c) Measure wort gravity (OG) - need to know what the original gravity is to determine alcohol content of beer. Measured using a hydrometer.
- d) Pitch yeast and aerate wort. Yeast needs O₂. Add oxygen by splashing wort while transferring from brew pot into bucket. Add yeast. Place lid on bucket and shake for a few minutes. Fill and attach air lock. You can use water or sanitizer. Do not over fill the air lock as you risk the liquid being sucked into wort. If you did not leave enough "head space" between lid and wort, you may need to use a blow off tube as yeast will produce foam, and you want to prevent foam from clogging air lock.

2) Fermentation: Temperature control is key to making good beer.

Place fermenter in a temperature stable area, 60-68F. 70-75F is ok, but lower is ideal. Temperature can be controlled by placing fermenter in closet/spare room/basement, or in a water bath with wet towel to chill. More expensive options include using a refrigerator or wine chiller. If using glass, then be sure you keep the carboy covered or place in a dark room. Light makes off-flavored beer!

Patience is the key. Fermentation should start in about 24 hours. Don't remove the lid to see how it is progressing, as you can introduce infection. Yeast are living, so they need time to do their job. Temperature, oxygen, age of yeast, how yeast was handled, pitch rate, and the gravity of the beer will impact how the yeast performs and time to finish. Your patience will be rewarded.

Dan differs with kit instructions

1. Don't rack to another vessel to perform "secondary fermentation". Just leave it in the same vessel for the yeast to complete their job.
2. Air lock activity is not a good way to judge when fermentation is done. Gravity measurement is.

3) Check gravity to see when fermentation completed

After a couple weeks, you will see activity in the air lock slow. If it appears to have stopped, give it a day or two to be sure; measure the gravity and record it. Wait 2-3 days and measure again. If no change, then can assume beer is finished fermenting. Also compare to the final gravity stated in the recipe.

Final gravity in kit is a reference range. Once you hit your final gravity, you are ready to package.

How to use a hydrometer. Remove enough wort to fill the test jar using a sanitized wine thief, or turkey baster. Insert hydrometer and read gravity – correct for temperature.

How much alcohol is in my beer? $(OG-FG) * 131.25 = \text{ ____ } \% \text{ ABV}$

Note: This is an overview – you can spend hours on yeast discussions.

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Recommended reading. "How to Brew", by John Palmer; "Yeast", by White & Zainasheff; AHA's Zymurgy magazine.

Presenter: Dan Schreffler, Wyoming Valley Home Brewers (beer@solarrat.com)





Wooo whooo! Bottling Day!

Packaging that home brew in bottles, or kegs.

Skills you need:

1. Can clean and sanitize
2. Lift 5 gallons of beer
3. Have the time

Steps: (2-4 hours)

1. Clean/sanitize bottles/caps/equipment.
2. Prepare priming sugar
3. Rack beer into bottling bucket
4. Fill bottles and cap.
5. Condition - wait, and then serve. (2-3 weeks)

What you are doing? Bottle “conditioning” and storing the beer. Conditioning is taking your flat beer and getting CO2 into it

Bottling

What you need:

- | | | | |
|---|--|---------------------------------------|---|
| <input type="checkbox"/> cleaner, and sanitizer | <input type="checkbox"/> bottling caps | <input type="checkbox"/> bottle brush | <input type="checkbox"/> capper |
| <input type="checkbox"/> racking (siphon) setup | <input type="checkbox"/> bottling bucket | <input type="checkbox"/> long spoon | <input type="checkbox"/> about 50 bottles |

Bottles: Clean, brown, bottles. Crown cap, or flip top. Green ok if protected from light. No clear, twist off or vortex bottle. Buying beer from local microbrew is excellent way to gather bottles!

(1) Clean/sanitize bottles/caps/equipment.

You spent weeks making beer, so don't ruin it now! Thoroughly clean your bottles. Soak them in a cleaner, and then use a brush. Rinse and then sanitize. This is a multi-step process, not one! Sanitize racking setup and bottling bucket

(2) Prepare priming sugar:

Bottle Bomb Warning! If beer has not completed fermentation, and/or use way too much priming sugar, you are at risk of having your bottles explode. Easy to prevent! Just make sure done, and you follow kit instructions.

Priming sugar will give yeast the resources to produce more CO2 while sealed in the bottle. Mix priming sugar (5oz for 5 gallons) in 2 cups of boiling water for 5 minutes. Pour into bottling bucket.

(3) Rack beer into bottling bucket

Using racking cane, gently siphon beer into bucket. Ideally place tubing at bottom of bucket - no splashing, and leave sediment behind. Stir gently.

(4) Fill bottles and cap

Using bottling wand, fill bottles to about 1 inch from top. Hint: use open dishwasher door. Cap and label.

(5) Wait & Serve

Place bottles in dark, temperature stable (65-72F) area to allow natural carbonation. After 2 weeks, sample a beer, if carbonated enough, get friends/family to enjoy!

Kegging

What you need:

- | | | |
|---|--|--|
| <input type="checkbox"/> cleaner, and sanitizer | <input type="checkbox"/> 5 gallon keg (“corney”) | <input type="checkbox"/> pressure regulator |
| <input type="checkbox"/> racking (siphon) setup | <input type="checkbox"/> CO2 tank | <input type="checkbox"/> hoses/quick connect |
| <input type="checkbox"/> tap | | |

(1) Clean/sanitize kegs and equipment.

You spent weeks making beer, so don't ruin it now! Thoroughly clean your kegs. Disassemble and soak in a cleaner, rinse and then sanitize. This is a multi-step process, not one!

Sanitize racking setup.

(2) Rack beer into keg

Using racking cane, gently siphon beer into keg. Ideally purge the air in keg with CO2 first, then place tubing at bottom of keg - no splashing, and leave sediment in fermenter behind.

(3) Carbonate

Hook up the CO2 line (hint: green = gas). Carbonation rate and pressure needed depends upon temperature. Colder is better.

Determine how much carbonation you want in the beer and the temperature the beer will be at during carbonation. Set pressure regulator accordingly. For example, a pale ale is 2.5 volumes – at 45F, need 15psi. At 70F need 35 psi.

(4) Wait & Serve

Hook up serving line (blue/black = beer). Sample every few days to see if it has reach desired carbonation level.

Serving from a keg requires more equipment than simply popping open a bottle. Use refrigerator, “jockey box”, or trashcan with ice to cool the beer. Reduce regulator pressure based on line length, serving pressure, taps, etc.

Excellent kegging resources:

- https://homebrewersassociation.org/attachments/0000/1312/Summerzym95-Kegging_How-To.pdf
- <http://morebeer.com/themes/morewinepro//kegging.pdf>

Have it all figured out? Then get those friends over!

Note: This is an overview – there is much more to learn than what covered today.

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