




BEER 101

- HISTORY OF BEER
 - VOCABULARY OF BEER
 - STATISTICS OF BEER
 - CHEMISTRY OF BEER
 - INGREDIENTS
 - BREWING PROCESS
 - GENERAL BEER CLASSIFICATIONS
- 

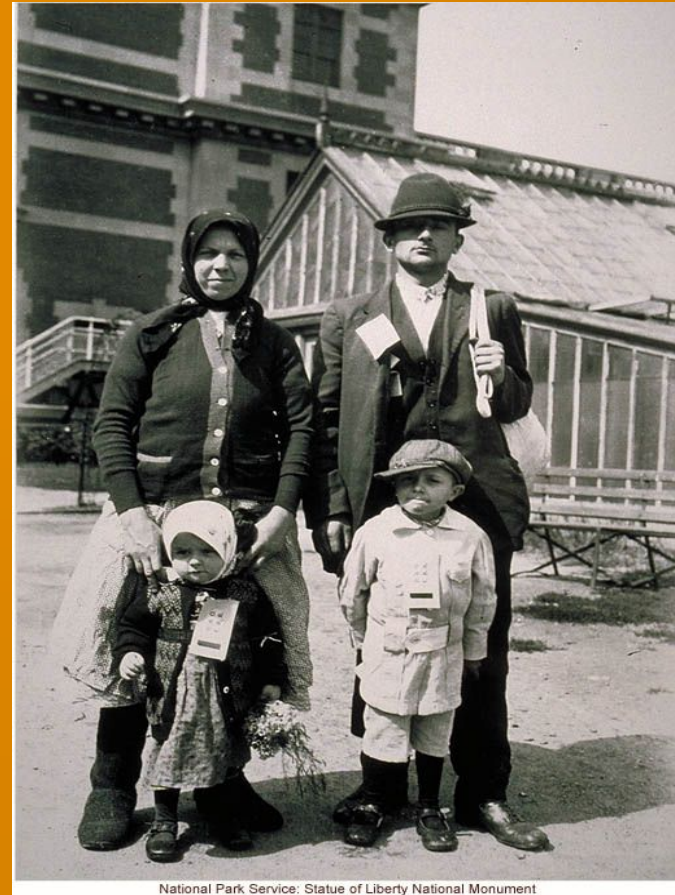
THE HISTORY OF BEER

- Primitive Man
- Mesopotamians
- local grains
- Romans & Gauls -
cerevesia
- *Ceres* - Roman
goddess of agriculture
- Spanish - *cervesa*



THE HISTORY OF BEER

- European Immigrants
- America
- Prohibition
- National Breweries
- Microbreweries



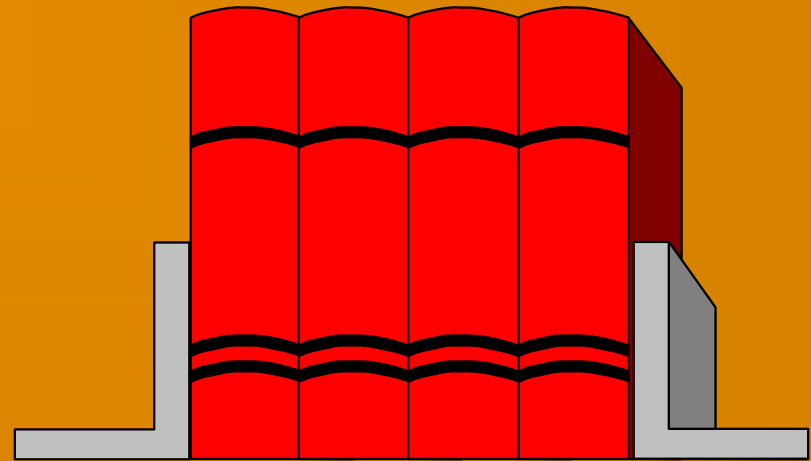
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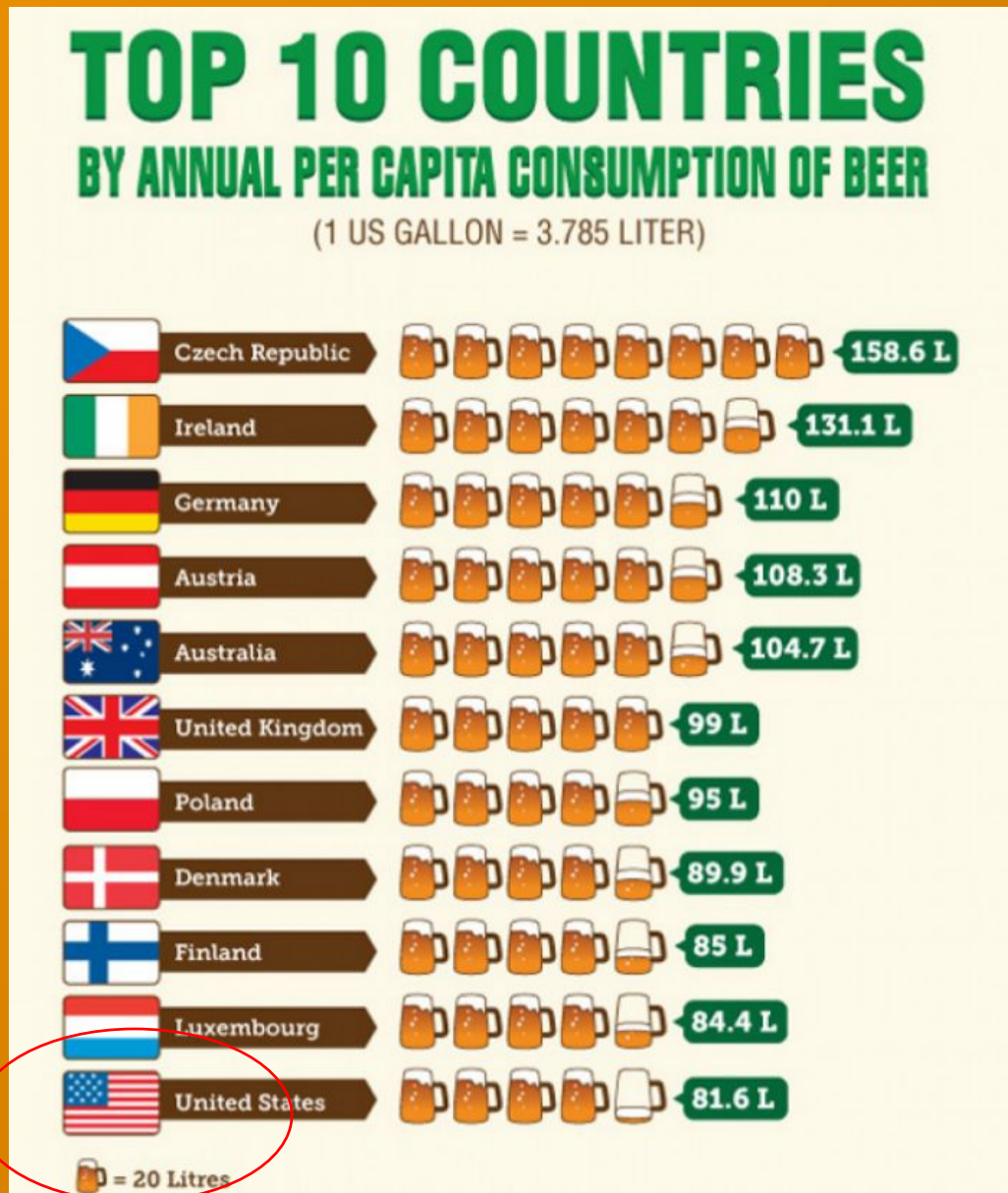


THE VOCABULARY OF BEER

- Alewife
- Blackjack
- Bridal
- Loggerheads
- P's and Q's
- Porterhouse Steak
- Skull
- Wassail



Let's look at some overall beer statistics:



U.S. BEER STATISTICS (2015)

- Market share for top 5 brewers and importers has changed significantly 2009-2015:

<u>Brewer/Importer</u>	<u>2009 Share</u>	<u>2015 Share</u>
Anheuser-Busch InBev	48.9%	43.5%
Miller Coors, LLC	29.5%	25.1%
Constellation/Crown	5.1%	7.4%
Heineken USA	4.0%	3.9%
Pabst Brewing	2.7%	2.5%
All Others	9.8%	17.5%


Top sellers in U.S.
in 2011. (*Where
does your favorite
fit in?.....*)



Beer Name		Dollar Sale Per Year (in Billions)
	Bud Light	\$5.327
	Budweiser	\$2.072
	Coors Light	\$1.946
	Miller Lite	\$1.672
	Natural Light	\$1.089
	Corona Extra	\$0.964
	Busch Light	\$0.735
	Busch	\$0.684
	Heineken	\$0.577



U.S. BEER STATISTICS (2015)

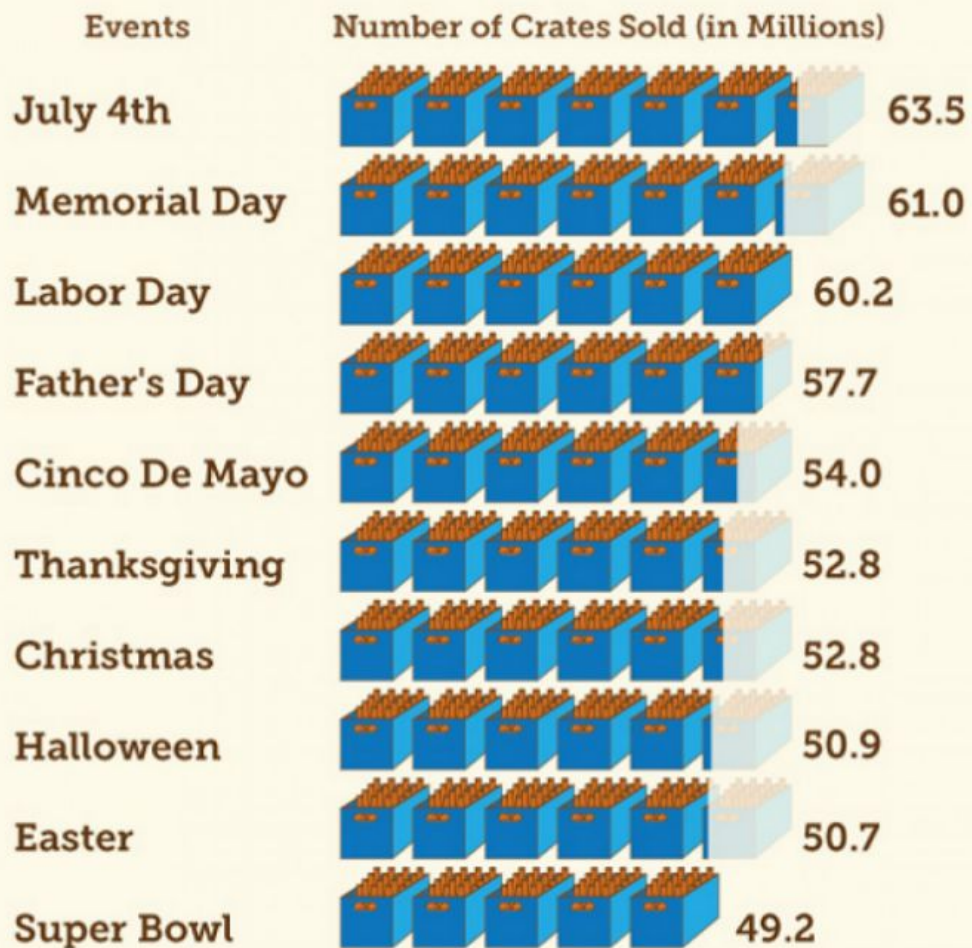
- 206.7 million barrels sold (*this is equivalent to more than 2.8 billion cases*)
 - 85% of all beer domestically produced, 14% imported from over 100 countries around the world
 - U.S. per capita consumption was 27.8 gallons of beer and cider per person
 - U.S. beer industry sells more than \$100 billion in beer and malt-based beverages to U.S. consumers each year
- 

Source: U.S. Alcohol and Tobacco Tax and Trade Bureau (TTB), and U.S. Commerce Department

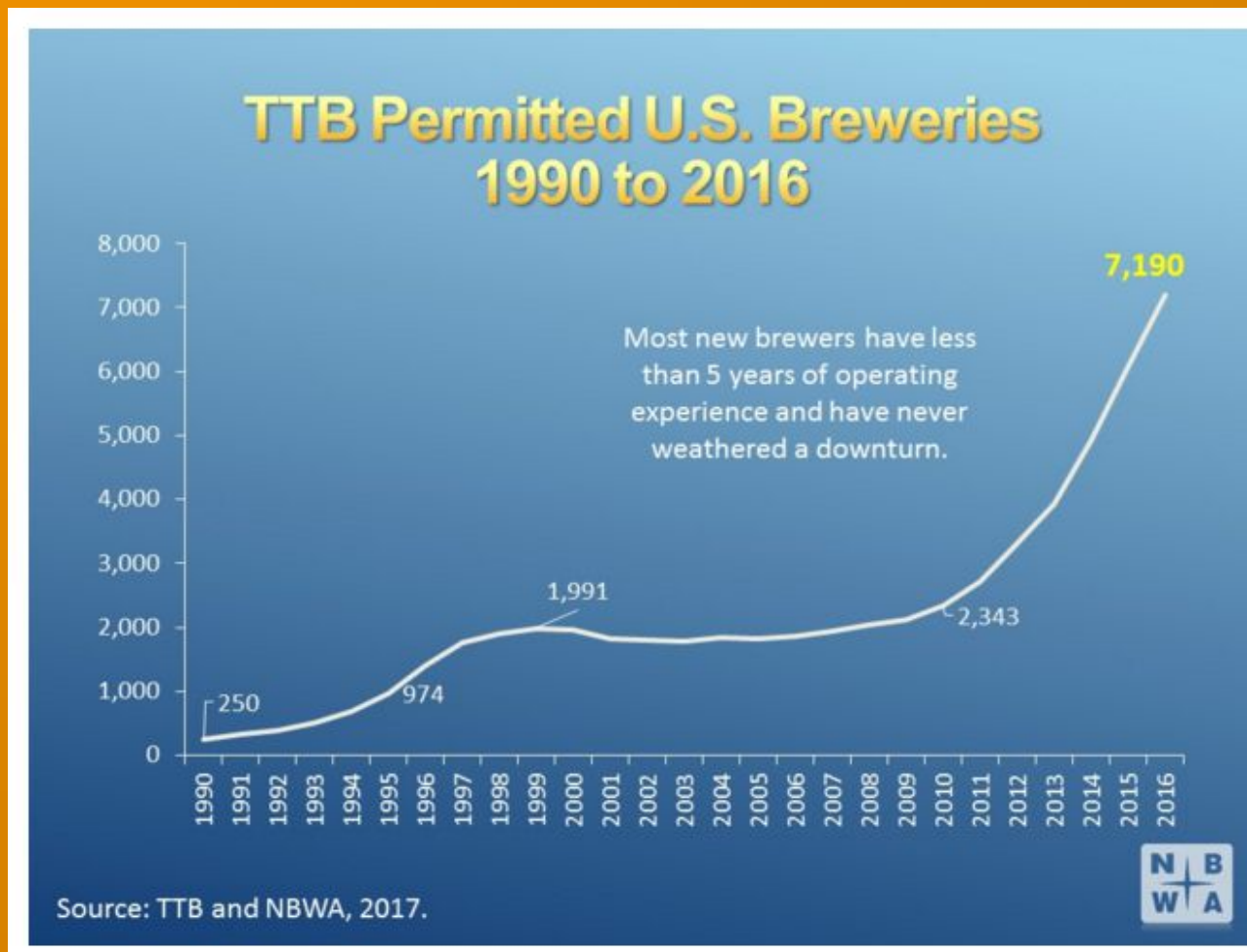
What is your favorite “beer holiday”?.....



HIGHEST BEER CONSUMPTION DAYS



CHANGING LANDSCAPE IN U.S.



CHANGING LANDSCAPE IN U.S.

TTB Permitted Brewery Count 7,180 as of 12/31/2016

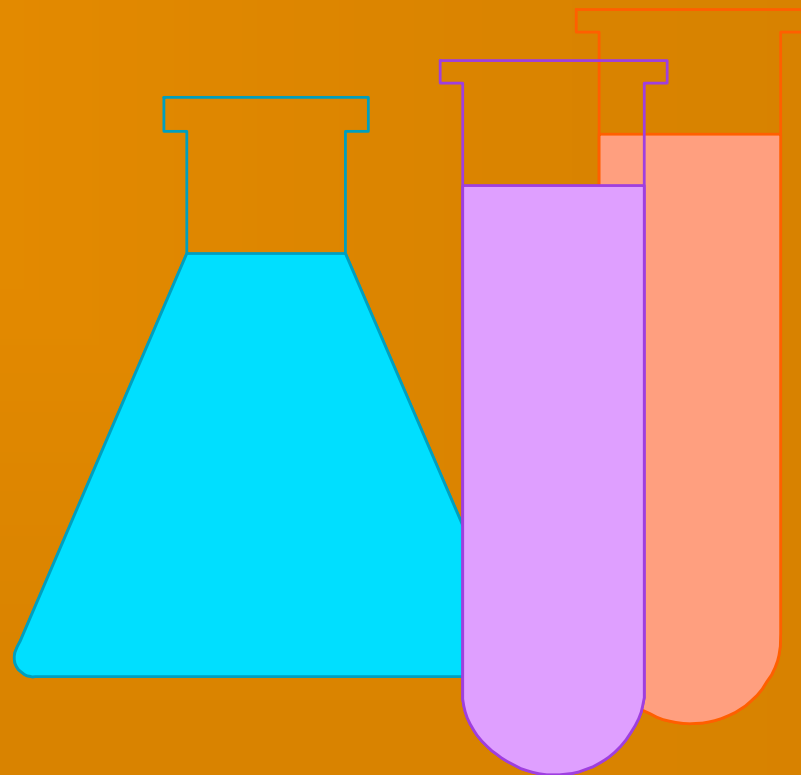
State	Count	State	Count	State	Count
Alabama	37	Kentucky	60	North Dakota	15
Alaska	36	Louisiana	34	Ohio	236
Arizona	110	Maine	102	Oklahoma	26
Arkansas	34	Maryland	88	Oregon	304
California	927	Massachusetts	146	Pennsylvania	333
Colorado	386	Michigan	379	Rhode Island	17
Connecticut	76	Minnesota	165	South Carolina	59
Delaware	25	Mississippi	14	South Dakota	21
DC	13	Missouri	116	Tennessee	101
Florida	264	Montana	79	Texas	266
Georgia	69	Nebraska	47	Utah	34
Hawaii	23	Nevada	44	Vermont	73
Idaho	67	New Hampshire	73	Virginia	209
Illinois	244	New Jersey	96	Washington	424
Indiana	163	New Mexico	86	West Virginia	24
Iowa	94	New York	394	Wisconsin	217
Kansas	47	North Carolina	260	Wyoming	33

Source: NBWA and TTB, 2017.



CHEMISTRY OF BEER

- Ingredients
- Malting
- Brewing
- Fermentation
- Aging
- Packaging



INGREDIENTS

- WATER
- BARLEY
 - malting
 - roasting
 - blending
- YEAST
- HOPS
 - bitterness/flavors




YEAST

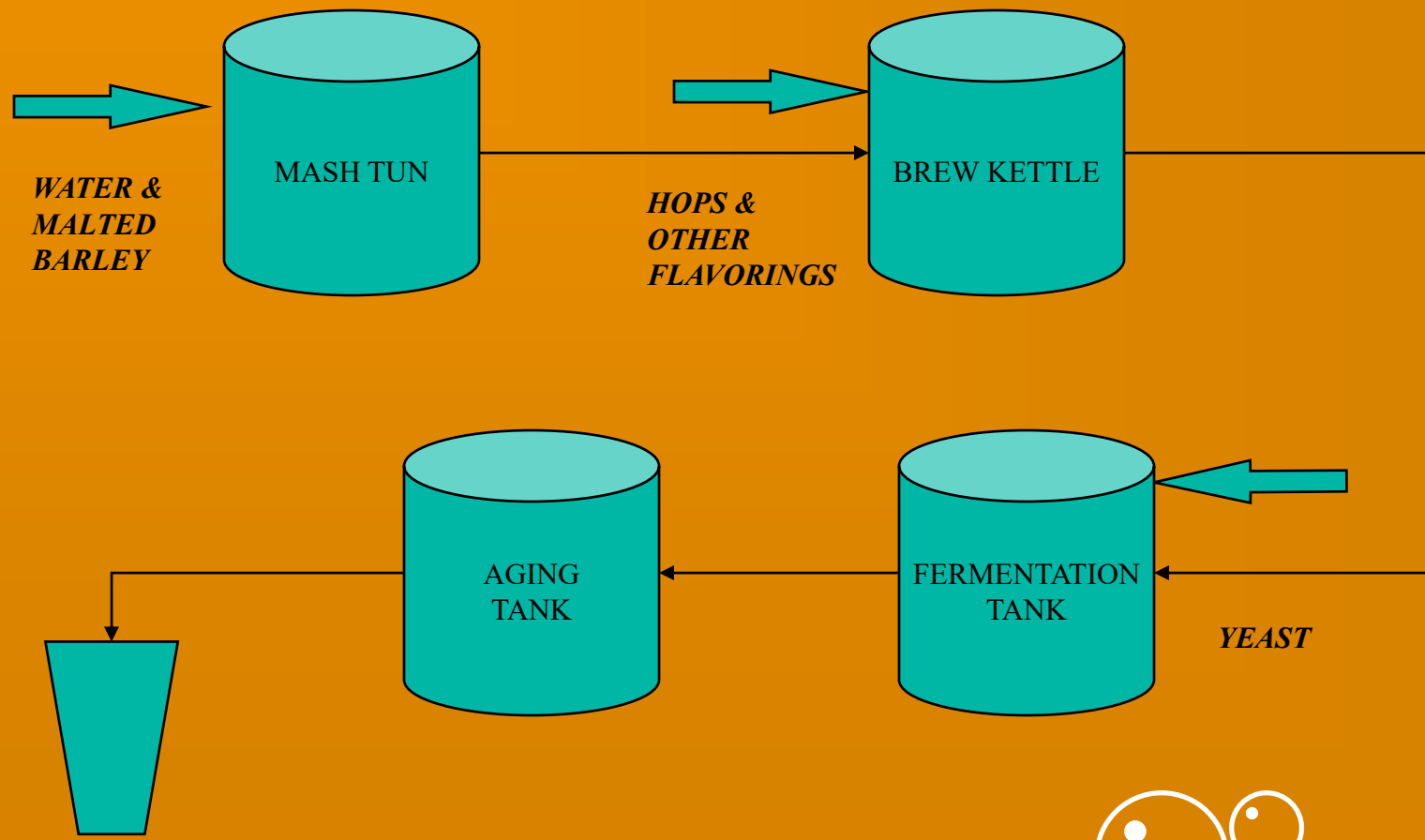
- MEMBER OF THE FUNGUS FAMILY
- CAUSES FERMENTATION
 - conversion of sugar (maltose) to alcohol
 - produces equal amounts of Ethanol and CO₂
- 2 CATEGORIES OF YEAST
 - ALE yeast (*saccharomyces cerevisiae*)
 - top fermenting, works best in 60°F - 70°F range
 - LAGER yeast (*saccharomyces uvarum*)
 - bottom fermenting, ferments beer in cooler temperatures



BREWING PROCESS


- MALTING
 - water to malt ratio $>$ alcohol content
 - GRINDING
 - WORT
 - BREWING
 - hops are added
 - FERMENTATION
 - PACKAGING
- 

BREWING BLOCK DIAGRAM





BEER CLASSIFICATION


- ALES
 - akin to Red wines
 - darker
 - complex flavors
 - top fermenting
 - warmer temps
- LAGERS
 - akin to White wines
 - lighter color
 - lighter body
 - bottom fermenting
 - colder temps
- 

ALES

- WHEATS (Hefeweizen, Weizenbock)
- STOUTS (sweet, oatmeal, dry)
- PORTERS
- PALE, BROWN, RED ALES
- INDIA PALE ALE
- CREAM, SCOTCH, GERMAN
- BITTER, BARLEYWINE



WHEAT BEER

- Weizenbier (wheat beer) or Weissbier (white beer)
 - 50% malted wheat
 - Hefeweizen (yeast wheat)
 - Kristallklar (crystal clear)
 - Weizenbock (wheat bock)
 - Berliner Weisse
- 



LAGERS

- PILSNERS
 - OCTOBERFEST
 - BOCK BEERS
 - RAUCHBIER
 - MALT LIQUORS
 - STEAM BEER (hybrid lager)
- 



LAGERS

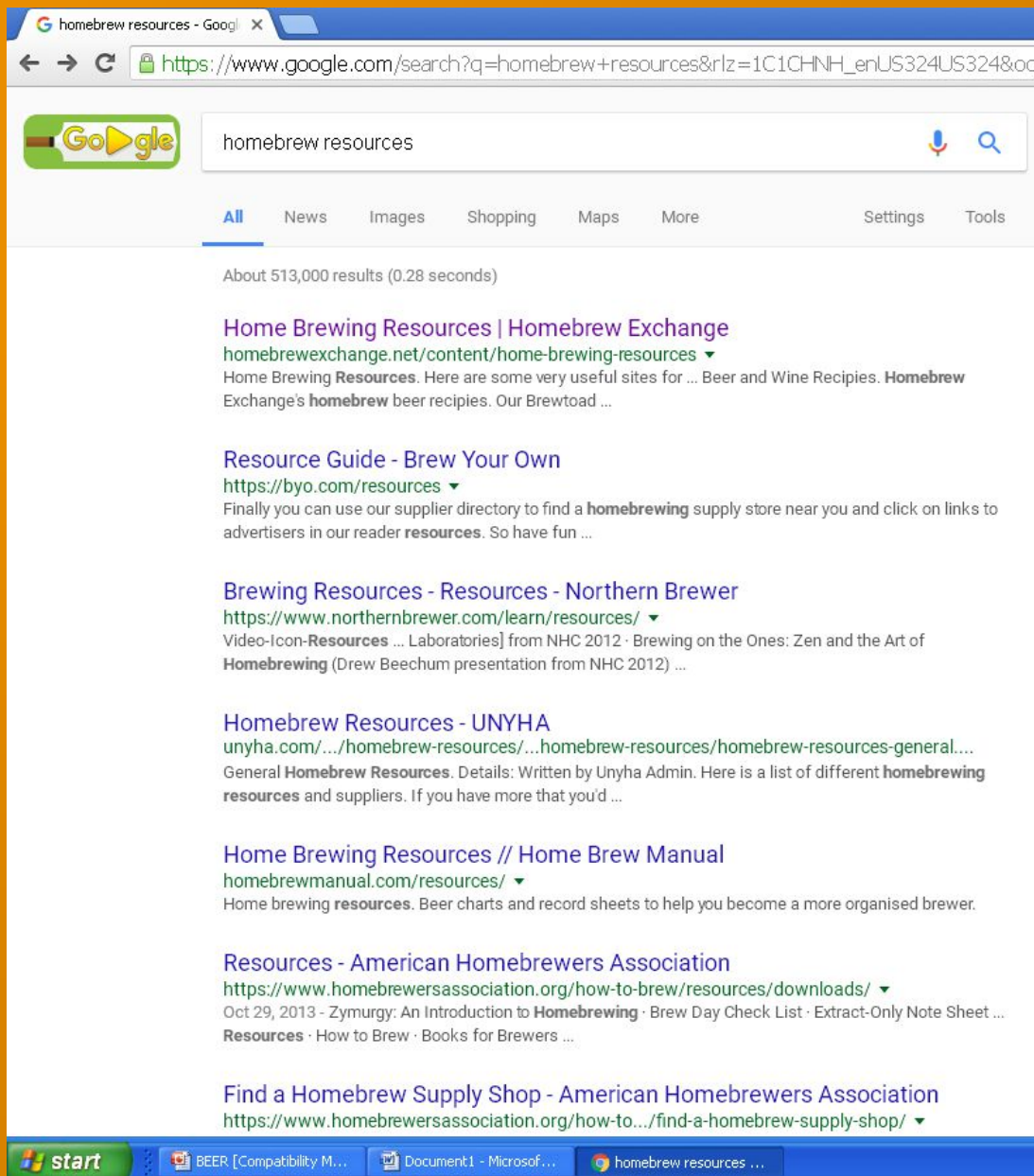
- PILSNERS
 - OCTOBERFEST
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 - MALT LIQUORS
 - STEAM BEER (hybrid lager)
- 



MISCELLANEOUS

- BACARDI BEER – HATUEY
 - CIDERS
 - MALT LIQUORS
- 

HOMEBREW RESOURCES



homebrew resources - Google

https://www.google.com/search?q=homebrew+resources&rlz=1C1CHNH_enUS324US324&ocq

homebrew resources

All News Images Shopping Maps More Settings Tools

About 513,000 results (0.28 seconds)

Home Brewing Resources | Homebrew Exchange
homebrewexchange.net/content/home-brewing-resources
Home Brewing **Resources**. Here are some very useful sites for ... Beer and Wine Recipes. **Homebrew** Exchange's **homebrew** beer recipes. Our Brewtoad ...

Resource Guide - Brew Your Own
<https://byo.com/resources>
Finally you can use our supplier directory to find a **homebrewing** supply store near you and click on links to advertisers in our reader **resources**. So have fun ...

Brewing Resources - Resources - Northern Brewer
<https://www.northernbrewer.com/learn/resources/>
Video-Icon-Resources ... Laboratories] from NHC 2012 - Brewing on the Ones: Zen and the Art of **Homebrewing** (Drew Beechum presentation from NHC 2012) ...

Homebrew Resources - UNYHA
unyha.com/.../homebrew-resources/...homebrew-resources/homebrew-resources-general...
General **Homebrew Resources**. Details: Written by Unyha Admin. Here is a list of different **homebrewing resources** and suppliers. If you have more that you'd ...

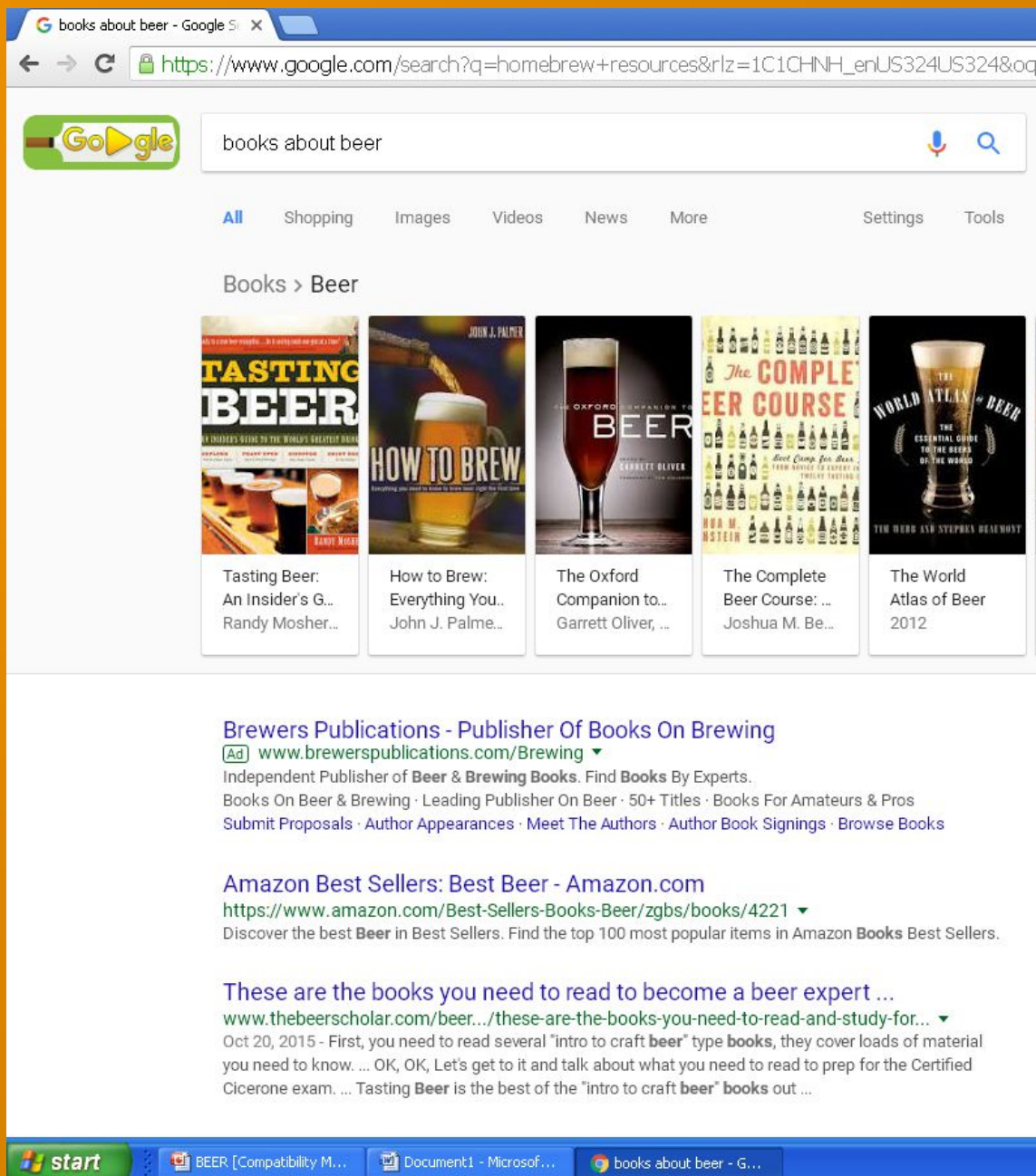
Home Brewing Resources // Home Brew Manual
homebrewmanual.com/resources/
Home brewing **resources**. Beer charts and record sheets to help you become a more organised brewer.

Resources - American Homebrewers Association
<https://www.homebrewersassociation.org/how-to-brew/resources/downloads/>
Oct 29, 2013 - Zymurgy: An Introduction to **Homebrewing** · Brew Day Check List · Extract-Only Note Sheet ... **Resources** · How to Brew · Books for Brewers ...

Find a Homebrew Supply Shop - American Homebrewers Association
<https://www.homebrewersassociation.org/how-to.../find-a-homebrew-supply-shop/>




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BOOKS ABOUT BEER



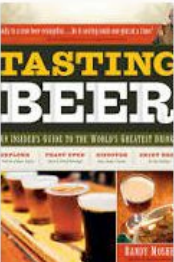
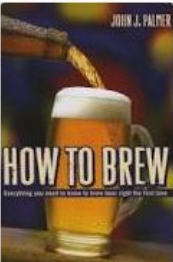

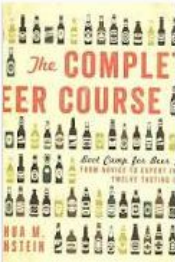
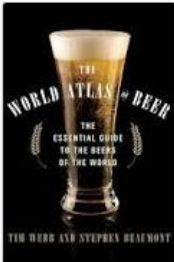
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Tasting Beer: An Insider's Guide to the World's Greatest Drink Randy Mosher...	How to Brew: Everything You Need to Know to Brew Beer Right John J. Palmer...	The Oxford Companion to Beer Garrett Oliver, ...	The Complete Beer Course: A Step-By-Step Guide to Beer Joshua M. Beech...	The World Atlas of Beer 2012

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<https://www.amazon.com/Best-Sellers-Books-Beer/zgbs/books/4221> 
Discover the best **Beer** in Best Sellers. Find the top 100 most popular items in Amazon **Books** Best Sellers.

These are the books you need to read to become a beer expert ...
www.thebeerscholar.com/beer.../these-are-the-books-you-need-to-read-and-study-for... 
Oct 20, 2015 - First, you need to read several "intro to craft beer" type **books**, they cover loads of material you need to know. ... OK, OK, Let's get to it and talk about what you need to read to prep for the Certified Cicerone exam. ... Tasting **Beer** is the best of the "intro to craft beer" **books** out ...

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HOME BREWER ASSOCIATIONS

The screenshot shows a Google search for "homebrewer association". The search results page displays several links related to the American Homebrewers Association (AHA). The top result is "How to Brew Beer | Homebrewers Association" with the URL <https://www.homebrewersassociation.org/>. Below this, there are several categorized links: "Homebrew Recipes", "Join or Renew", "AHA Forum", "AHA Member Deals", "Zymurgy", and "Contact Us". Further down, there are results for "American Homebrewers Association® - Great American Beer Festival", "American Homebrewers Association Store", and "New American Homebrewers Association Survey Details ...". The browser's taskbar at the bottom shows the Windows Start button and several open applications, including "BEER [Compatibility M...", "Document1 - Microsof...", and "homebrewer associati...".

homebrewer association - Go X
https://www.google.com/search?q=homebrew+resources&rlz=1C1CHNH_enUS324US324&og=
Google homebrewer association
All News Maps Images Shopping More Settings Tools
About 187,000 results (0.84 seconds)
How to Brew Beer | Homebrewers Association
<https://www.homebrewersassociation.org/>
The American **Homebrewers Association (AHA)** is a not-for-profit organization based in Boulder, Co., dedicated to promoting the community of homebrewers ...
Search homebrewersassociation.org
Homebrew Recipes
Browse hundreds of tried-and-true beer, mead and cider ...
AHA Member Deals
AHA Member Deals are discounts AHA members enjoy at ...
Join or Renew
Membership Today. Already a member? Renew now ...
Zymurgy
Search through all past issues of Zymurgy magazine with the ...
AHA Forum
Join the homebrewing community today by registering for the AHA ...
Contact Us
Please contact the AHA Member Services Department for ...
American Homebrewers Association® - Great American Beer Festival
<https://www.greatamericanbeerfestival.com> › [At the Festival](#) › [Learn about Homebrew](#) ▼
Learn how to brew better beer with the American **Homebrewers Association (AHA)**. If you're just getting started in homebrewing, or have been brewing as long ...
American Homebrewers Association Store
<https://members.brewersassociation.org/store/> ▼
Books: Beer Style · Books: Brewing Science · Books: Business of Beer · Books: Cooking/Pairing · Books: Culture/History · Books: **Homebrewing** · Books: Travel
New American Homebrewers Association Survey Details ...
<https://www.brewersassociation.org/.../new-american-homebrewers-association-survey...> ▼
Nov 8, 2013 - Boulder, CO · November 12, 2013—The American **Homebrewers Association (AHA)**—the not-for-profit trade association serving as a resource







AIChE BEER BREWING COMPETITION

AIChE ANNUAL
MEETING:
MINNEAPOLIS, MN

THE CHEMISTRY OF BEER

Community Awards AIChE Beer Brewing Competition

AIChE Beer Brewing Competition

Share  Share 7  Like 62  G+ 0  Tweet  




With the support of the [AIChE Foundation](#), AIChE and the [Young Professionals Committee](#), come showcase your chemical engineering skills by participating in the first AIChE Beer Brewing Competition (ABBC). ABBC will allow AIChE Local Sections to create teams of two to five professional members, over the age of 21, to brew their own beer in a particular style category (undergraduate students not eligible to participate). Professional beer tasting judges will then score beers according to a standard beer tasting rubric. Teams will also strut their chemical engineering muscles through a poster competition describing their processes and creative design that has gone into their brew. The prizes are big, the processes are batch, and the competition is exciting.

The first competition will be held on October 29, 2017 at the [2017 AIChE Annual Meeting](#) with a sign up deadline of July 28, 2017.




AIChE COMPETITION

OVERVIEW:

- Local sections create teams of 2-5 members, 21 years old and older (undergraduates ineligible)
 - Professional beer tasting judges will score entries
 - *Beer Judge Certification Program (BJCP) certified and competition procedures followed*
 - Beer styles to be brewed will be announced
 - Poster competition describing the process is part of the competition
- 




AIChE COMPETITION

- **Tasting:** 80% of overall score – Gold / Silver / Bronze awards will be given
 - **Poster:** 20% of overall score – Gold / Silver / Bronze awards will be given
 - **Grand Prize:** Best cumulative score of tasting & poster competitions – winners receive:
 - Winner's plaque
 - Competition beer cups
 - Complimentary 1-year AIChE membership
 - Featured in AIChE webinar
- 



AIChE COMPETITION

- **Poster Competition must at least include the following:**
 - Beer recipe
 - Mass balances
 - % ABV calculations
 - Process used to brew
- 



AIChE COMPETITION

- **Important Dates:**
 - **July 28, 2017** – deadline to register to compete
 - **August 7, 2017** (*week of*) – Style (or styles) of beer announced by email
 - **October 27, 2017** – all beers shipped to competition venue (*address TBD*)
 - **October 29, 2017** – Competition Day!
- 

Complete instructions are available on the website