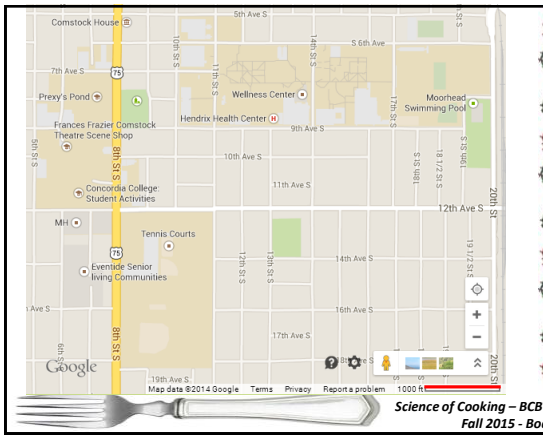
From Last Time:

Measurements

How far is it from MSUM to NDSU?
Units – miles, minutes, steps, etc
Start/End points
Uncertainty {“error”}
Significant Figures



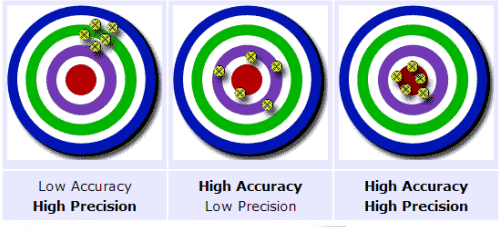
Uncertainty {“error”}

Indicates reliability of a number or variability in repeated measurements

Communicates precision and accuracy

Precision & Accuracy

Accuracy = bullseye
Precision = tight grouping



Significant Figures

Communicates error

Rounding numbers introduces error – be careful!

Significant Figures

Round error to a single digit

{unless it's "1", then keep two digits}

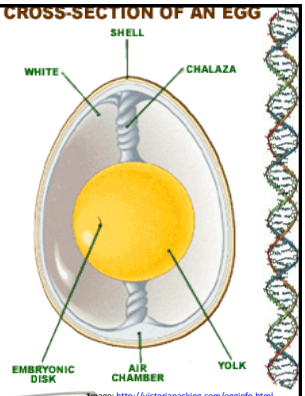
Round the reported value to the same digit as the error is rounded.

Eggs

Shell
- Calcium carbonate

White
- Albumin (protein)
- Thick and thin

Yolk
- Fat
- Lecithin (emulsifier)



http://www.youtube.com/watch?v=DkL-Npm3_cI

Image: http://victoriapacking.com/egginfo.html

Eggs

Fresher Eggs
- Thick albumen
- Prominent chalazae
- Sink in water

Aging…
- Albumen & chalazae break down
- Air bubble grows…

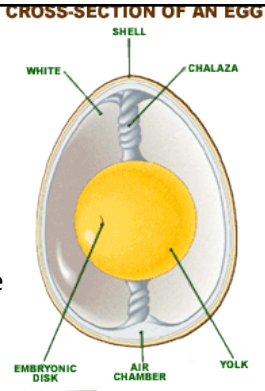


Image: http://victoriapacking.com/egginfo.html

White or brown?

Shell color is largely meaningless
- Indicates breed
- Pinks, greens, etc

Image: http://www.whitmorefarm.com/eggs

Image: http://www.theinnovationdiaries.com/613/how-to-raise-chickens-to-lay-eggs/

Eggs and Chickens

"Indeterminate layers"
- ~25 hour cycle (industrial)
- 200-300 eggs per year
- 2-3 year laying "lifetime"

Image: http://www.motherearthnews.com/Sustainable-Farming/Best-Chicken-Breeds-For-Backyard-Flocks.aspx

Image: http://organicconnectmag.com/wp/are-these-drugs-in-your-chicken-dinner/#.UG2MCU3yrPA

Eggs

Yolk
- Fat, food

White
- Shock absorber

Shell
- Protection

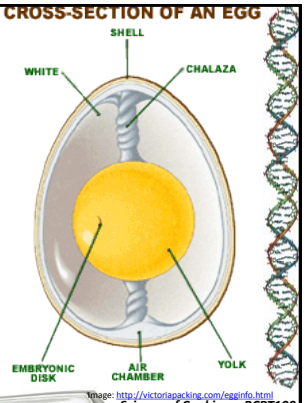


Image: http://victoriapacking.com/egginfo.html

Cooking with Eggs

Consider composition

- White = protein + water
  - "Cooking" denatures protein
- Yolk = protein + fat
  - and all the other nutrients…

Image: http://whatscookingamerica.net/Eggs/BoiledEggs.htm

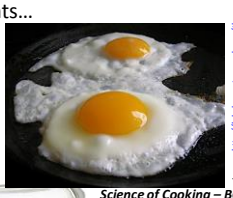


Image: http://kitchenmyblogspot.com/the_greasy_spoon/2008/07/perfect-fried-e.html

Temperature Conversions

Fahrenheit (historically)

- 0°F = Salt water freezing (colligative)
- 32°F = Water freezing
- 96°F = "blood heat"

Celsius (historically)

- 0°C = Water freezing
- 100°C = Water boiling

Adjustments over time…

Do the math

What is "body temperature"?

Absolute Scales

Kelvins

- 1K = 1°C
- "Zero" really means "zero"
- 0°C = 273.15K

Rankine (rarely used)

- 1°R = 1°F
- "Zero" is absolute zero
- 0°F = ??°R

Temp!

Scales

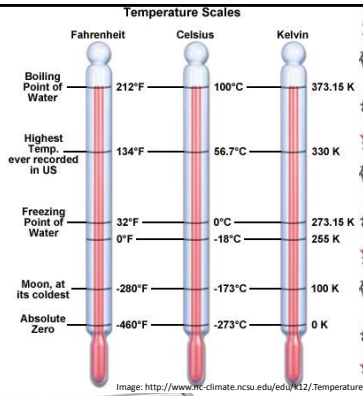


Image: http://www.nc-climate.ncsu.edu/edu/k12/.Temperature

Heat Management

Specific Heat Capacity –

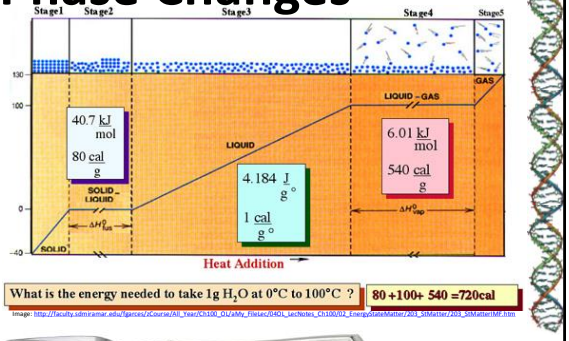
the amount of heat energy required to raise the temperature of 1 gram of a substance 1°C.

For water, 1 calorie per gram °C

- "Dietary Calorie" vs. calorie

http://www.engineeringtoolbox.com/specific-heat-capacity-food-d_295.html

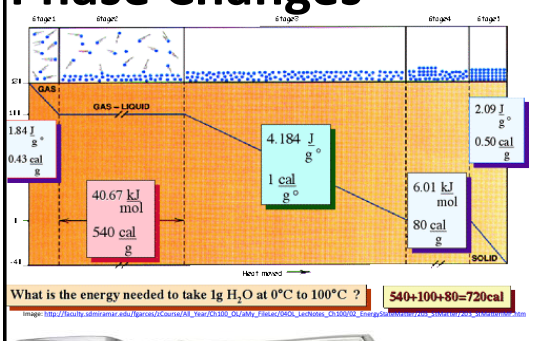
Phase Changes



What is the energy needed to take 1g H_2O at 0°C to 100°C ? 80 +100+ 540 =720cal

Image: http://faculty.sdmiramar.edu/fgarces/zCourse/All_Year/Ch100_01/aMy_FileLec/040L_LecNotes_Ch100/02_EnergyStateMatter/203_StMatter/203_StMatterIMF.htm

Phase Changes



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