How to estimate when measuring

EHS CΛ3мIs+ry

Mr. Genest

Announcements:
- Our first big test is Thursday, September 24, 2015
- Memorize twenty elements total by Friday September 18, 2015

1. Calculate the volume of a block that is 0.00371cm x 0.044cm x 0.68cm

MULTIPLYING RULE | Round to two sig figs $0.0001110032 \approx 0.00011$ cm^3

2. What is the perimeter of a rectangle that is 2.008cm x 5.4cm?**

ADDING RULE | Round to the tenths $14.816 \approx 14.8$ cm

For each of the following, write the scale reading, then the number of significant figures in the reading.

Scale	Reading	SF's
6 7 8 9 10	8.9	two
6 7 8 9 10	8.95	three
120 130 140 150 160	133	three
2200 2210 2220 2230 2240	2225.5	five (!)
110 120 130	114.2	four
1000 1100 1200	1120	three
0 0.1 0.2 0.3 0.4	0.64	two
0.01 0.02 0.03 0.04 0.05	0.0260	

3. add a zero, just like you would add a 5 if between the black lines. That tells us it is exactly on the line.

6. For each of the volume devices below record the scale reading and indicate the uncertainty in the measuremer
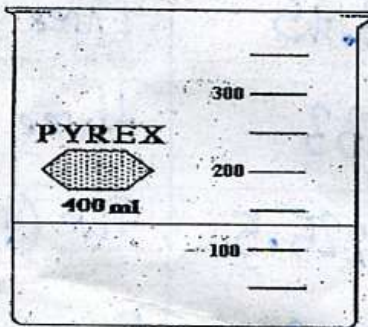(± _____).

scale reading **177**

uncertainty _____

200

150

100

50

9

38.2

100 ml
90
80
70
60
50
40
30
20
10

scale reading **382**

uncertainty _____

10

10 ml
9
8
7
6
5
4
3
2
1

scale reading **2·30**

uncertainty _____

because it's exactly on line.

11

Note the upside-down scale.

14.40

PYREX

◇ 400 ml

300

200

100

12

scale reading **130**

uncertainty _____

12
13
14
15
16
17
18
19
20

scale reading _____

uncertainty _____

13

How to think about two related measurements

1. Write a hypothesis of the form

"I believer the amount of ~~meat eaten~~ cancer depends on the amount of ~~cancer~~ meat eaten

2. Table

Make a table with only the data points that you trust. You're allowed to throw out data points if you have a good reason to distrust them. Important: the left column must be the independent variable. The minimum number of points for this assignment is

Cancer (y)	Meat (x)
7	1000
2	600
7	700
12	1200
14	1300
6	600
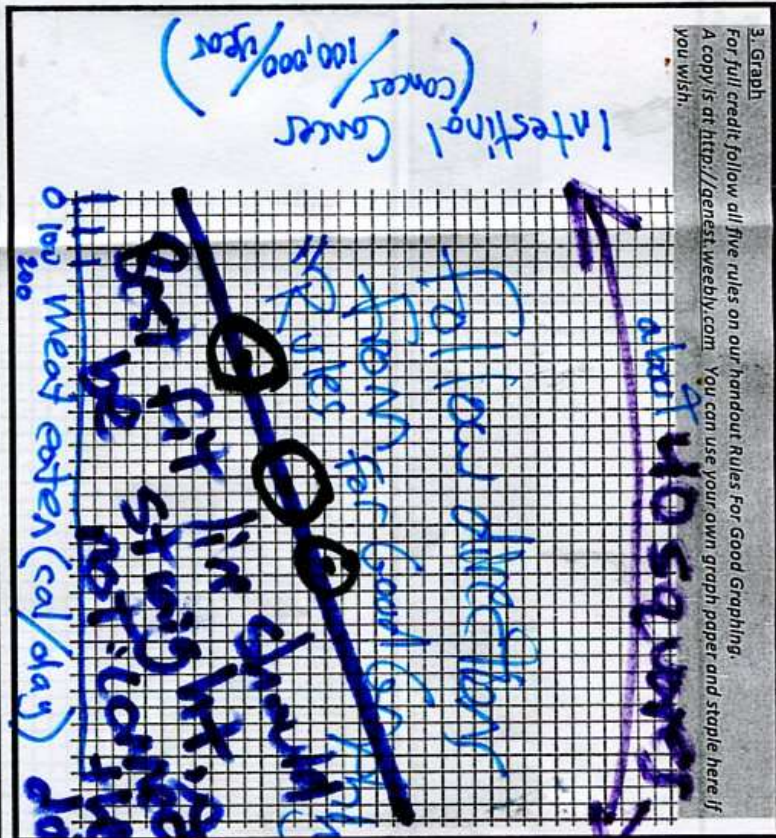
4. Equation

Write a y = mX + B equation. Replace the letters Y and X with your variables from your hypothesis in Step 1. To calculate m (the slope) use any two points from the best fit line you drew with a ruler on your graph.

calculate Δy but don't use your dots ΔX

use your best fit line.

3. Graph

For full credit follow all five rules on our handout Rules For Good Graphing. A copy is at <u>http://genest.weebly.com</u>   You can use your own graph paper and staple here if you wish.

(cancer /100,000/year)

Intestinal Cancer

about 40 squares

follow directions from "Rules for Good Graphing"

best fit line straight not connected dots

0 100 Meat eaten (cal/day)
200

5. Sentence

Based on the "m" (slope) you calculated in Step 4, write a sentence similar to "for every 2 bags there are 34 potatoes". Your X variable always goes first in such a sentence.

"I HEARD THAT EATING MEAT GIVES YOU CANCER!"

Intestinal Cancer (per 100,00/per year)	meat eaten (cal per day)	Ignore this column when graphing
7	1000	Italy
2	600	Venezuela
7	700	Israel
12	1200	France
14	1300	USA
6	600	Japan

Purpose: How do we use a graph to answer an important question.

Warmup: Copy this table to the Table on your sheet

Announcements:
1) Chemistry test Thursday, September 24
2) Chemistry Homework tonight: Finish the front and back of the graph sheet

Pick your Poison
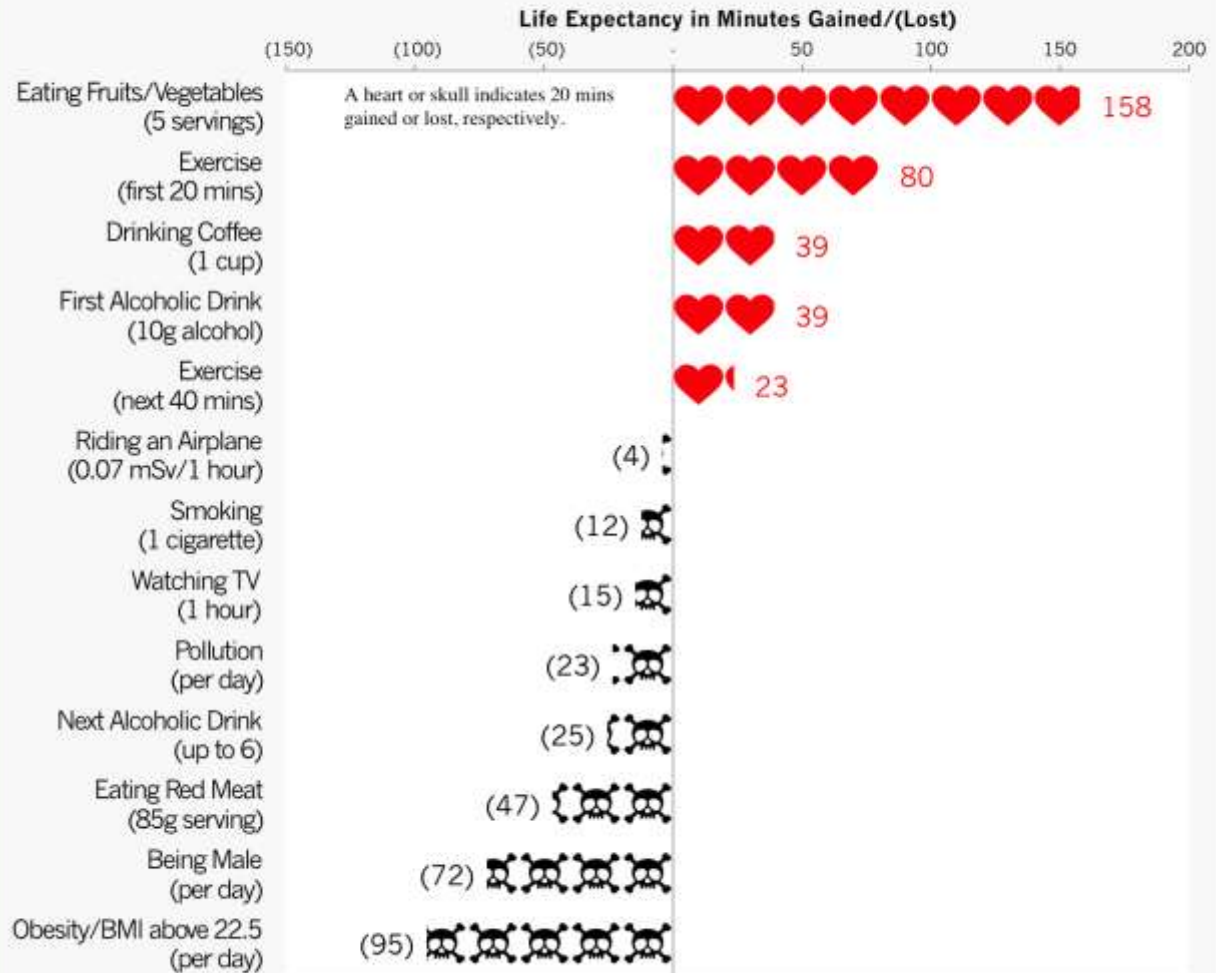**Chronic Behavior and their Effect on Life Expectancy**
Data Source: "The Norm Chronicles" · M. Blastland & D. Spiegelhalter

Jumbo Dumbo Thoughts
http://www.jumbodumbothoughts.com

Life Expectancy in Minutes Gained/(Lost)

	(150)	(100)	(50)		50	100	150	200

Eating Fruits/Vegetables (5 servings) — A heart or skull indicates 20 mins gained or lost, respectively. ❤️❤️❤️❤️❤️❤️❤️❤️ 158

Exercise (first 20 mins) ❤️❤️❤️❤️ 80

Drinking Coffee (1 cup) ❤️❤️ 39

First Alcoholic Drink (10g alcohol) ❤️❤️ 39

Exercise (next 40 mins) ❤️ 23

Riding an Airplane (0.07 mSv/1 hour) (4)

Smoking (1 cigarette) (12) ☠️

Watching TV (1 hour) (15) ☠️

Pollution (per day) (23) ☠️

Next Alcoholic Drink (up to 6) (25) ☠️

Eating Red Meat (85g serving) (47) ☠️☠️

Being Male (per day) (72) ☠️☠️☠️☠️

Obesity/BMI above 22.5 (per day) (95) ☠️☠️☠️☠️☠️

Homework assignment:

On the front, graph Cancer vs Meat.

On the back, graph Water mL vs ruler cm3 data, from our class, on today's class web page

Follow
"Rules for good graphing" sheet
(in class or online)