Wednesday, August 29, 2018

	Brown	Blonde	Black	Red	TOTAL
Male	26	24	10	3	
Female	20	35	12	6	
TOTAL					

- Warm-up
  - Use the contingency table comparing hair color to gender to answer the following questions
    - What percent of the survey was male?
    - What percent of people have red hair?
    - What percent of males have red hair?
    - What percent of redheads are males?
    - Do you believe that being a redhead is independent of gender? Explain.
- Check Homework
- Review
  - FR practice
  - MC practice

Warm-up

- What percent of the survey was male? $\frac{63}{136} \approx 46.3\%$

- What percent of people have red hair? $\frac{9}{136} \approx 6.6\%$

- What percent of males have red hair? $\frac{3}{63} \approx 4.8\%$

  % of males – 46.3%
  % of males who are redheads 4.8%

- What percent of redheads are males? $\frac{3}{9} \approx 33.3\%$

  % of redheads 6.6%
  % of redheads that are male 33.3%

  "are they associated?"

- Do you believe that being a redhead is independent of gender? Explain.

	Brown	Blonde	Black	Red	TOTAL
Male	26	24	10	3	63
Female	20	35	12	6	
TOTAL				9	136
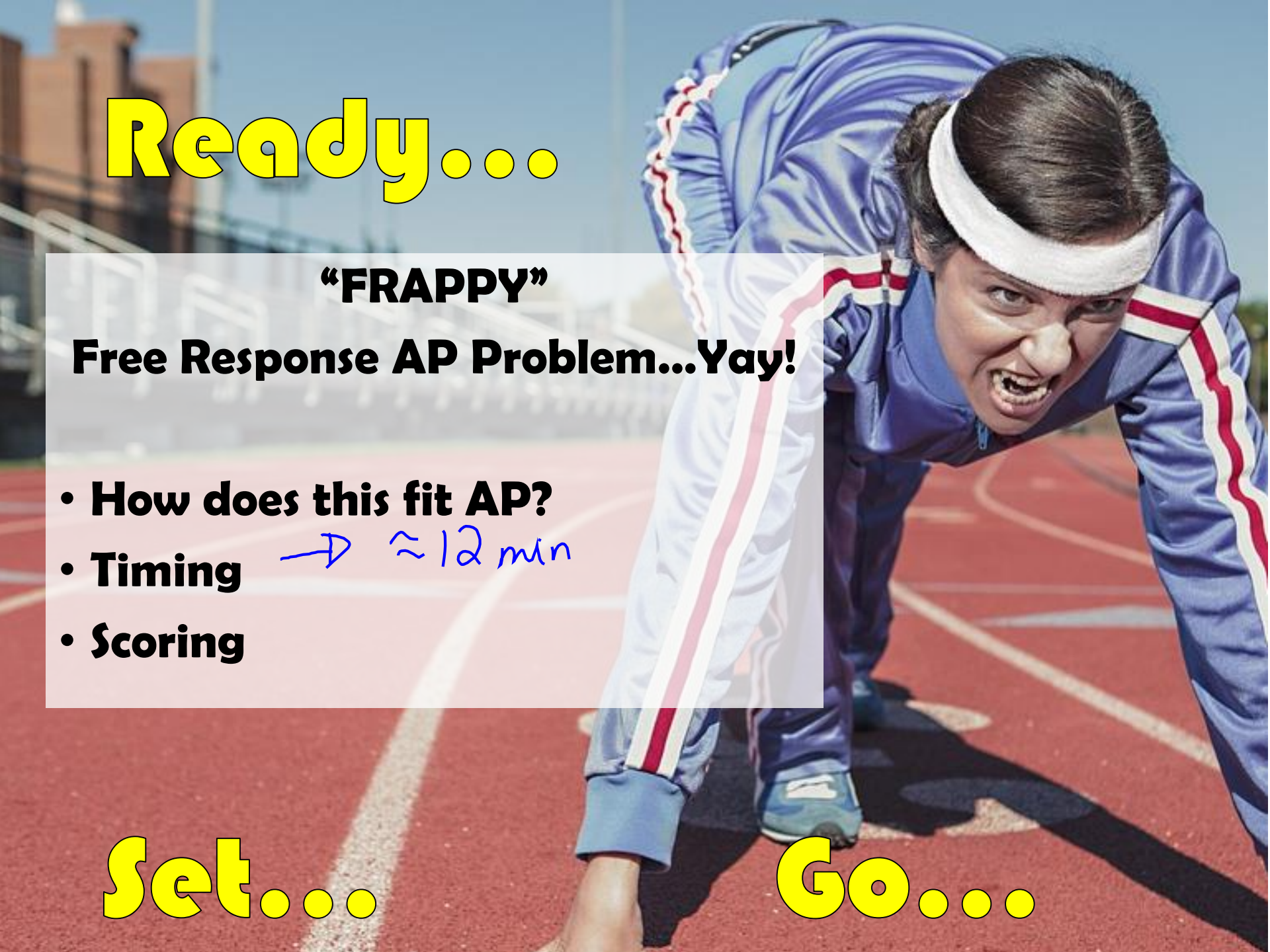
Two parents have each built a toy catapult for use in a game at an elementary school fair. To play the game, students will attempt to launch Ping-Pong balls from the catapults so that the balls land within a 5-centimeter band. A target line will be drawn through the middle of the band, as shown in the figure below. All points on the target line are equidistant from the launching location.
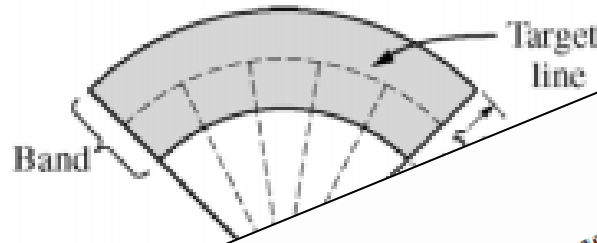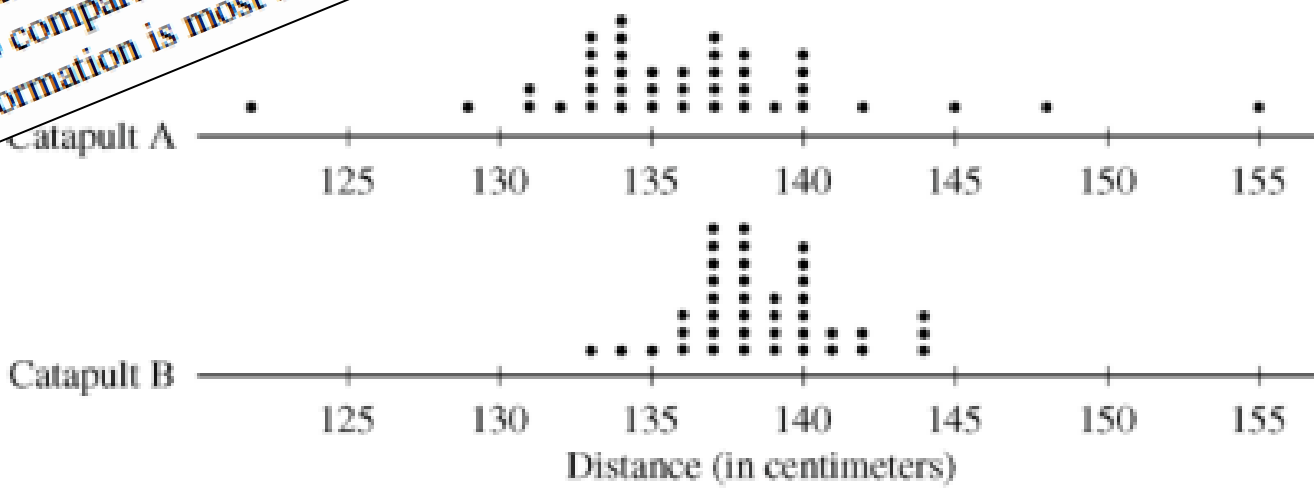

If a ball lands within the sha[...]

The parents [...]
catap[...]

[...] to slightly different plans. They want to test these [...] tical conditions, the parents launch 40 Ping-Pong balls from [...] the ball travels before landing. Distances to the nearest centimeter

Distance (in centimeters)

Part (a):

~spread

Both distributions of distances are roughly symmetric and somewhat mound-shaped. The center of the distances for catapult A (median A = 136 cm) is slightly lower than the center of the distances for catapult B (median B = 138 cm). There is more variability in the distances traveled by the Ping-Pong balls launched with catapult A. There are distances that are extreme enough to be called (potential) outliers in the catapult A distribution, but there are no outliers among the catapult B distances.

Part (a) is essentially correct (E) if the student correctly identifies similarities and differences in center, spread, and shape for the two distributions.

Part (a) is partially correct (P) if the student correctly identifies similarities and differences in two of the three characteristics (center, shape, and spread) for the two distributions.

Part (a) is incorrect (I) if the student correctly identifies no more than one similarity or difference of the three characteristics (center, shape, and spread) for the two distributions.

(b) If the parents want to maximize the probability of having the Ping-Pong balls land within the band, which of the two catapults, A or B, would be better to use than the other? Justify your choice.

Part (b):

Catapult B would be best because the distances vary less about the center of the distribution for catapult B. If catapult B is properly placed, the balls launched will have a higher probability of landing in the narrow (only 5 cm wide) target band.

spread

Part (b) is essentially correct (E) if catapult B is chosen using a rationale based on the variability in the distances.

Part (b) is partially correct (P) if catapult B is chosen, but the explanation does not refer to the variability in the distances.

Part (b) is incorrect (I) if catapult B is chosen and no explanation is provided OR catapult A is chosen.

(c) Using the catapult that you chose in part (b), how many centimeters from the target line should this catapult be placed? Explain why you chose this distance.

mean
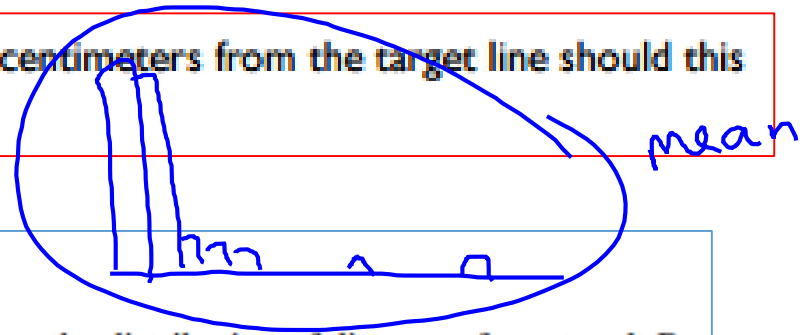
Part (c):

The catapult should be placed 138 cm from the target line. Since the distribution of distances for catapult B seems to be fairly symmetric and somewhat mound-shaped, the median (138 cm) is a good representation of the center of the distribution. Placing catapult B at this location would have resulted in a high proportion (30/40 = 0.75) of Ping-Pong balls from this sample of launches landing in the target band.

Part (c) is essentially correct (E) if:
the catapult is placed at the median (or mean) of the distances traveled by the Ping-Pong balls, and the explanation addresses why the median (or mean) was selected based on a property of the chosen statistic that relates to the context of the problem;
   OR
the catapult is placed at a distance of 137.5-139.5 cm from the target line, and the explanation indicates that the chosen distance resulted in a high proportion of the balls in the sample landing in the target band.

Part (c) is partially correct (P) if the catapult is placed at an acceptable distance from the target line, but the explanation is incomplete or incorrect.

Part (c) is incorrect (I) if the catapult is placed less than 137.5 centimeters or more than 139.5 centimeters from the target line.
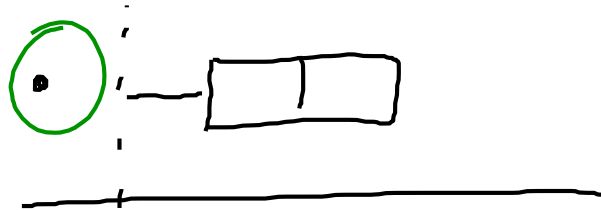
What do you need to see?
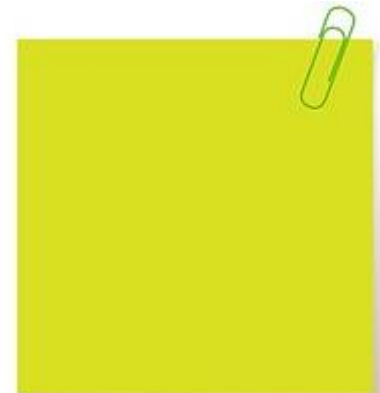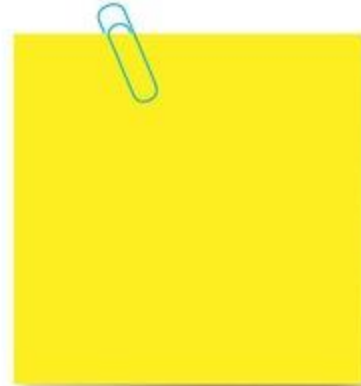
Min
Q1
Med
Q3
Max

Mean - histogram "balancing point"

box plot => scale "ruler"

fences -> $Q1 - 1.5\,IQR$ < is an outlier

$Q3 + 1.5\,IQR$ > is an outlier

blank

Multiple Choice Practice

Homework:

Gather the homework from the chapter to turn in ~~tomorrow~~: *Friday*

- Chap 3 reading notes (wkst)
- P 38 (11 – 13)
- P 41 (28, 29)
- P 75 (32 – 34)
- P 76 (36, 40 + box plot)
- P 72 (5 – 8)
- P 97 (13-16)