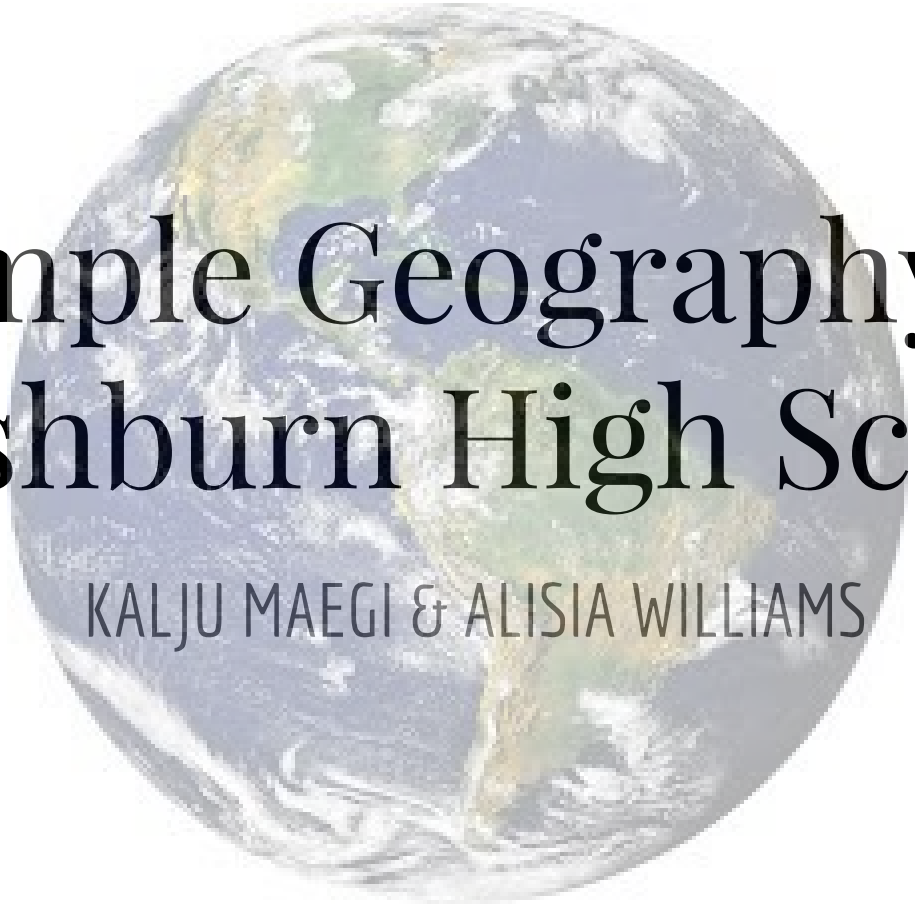


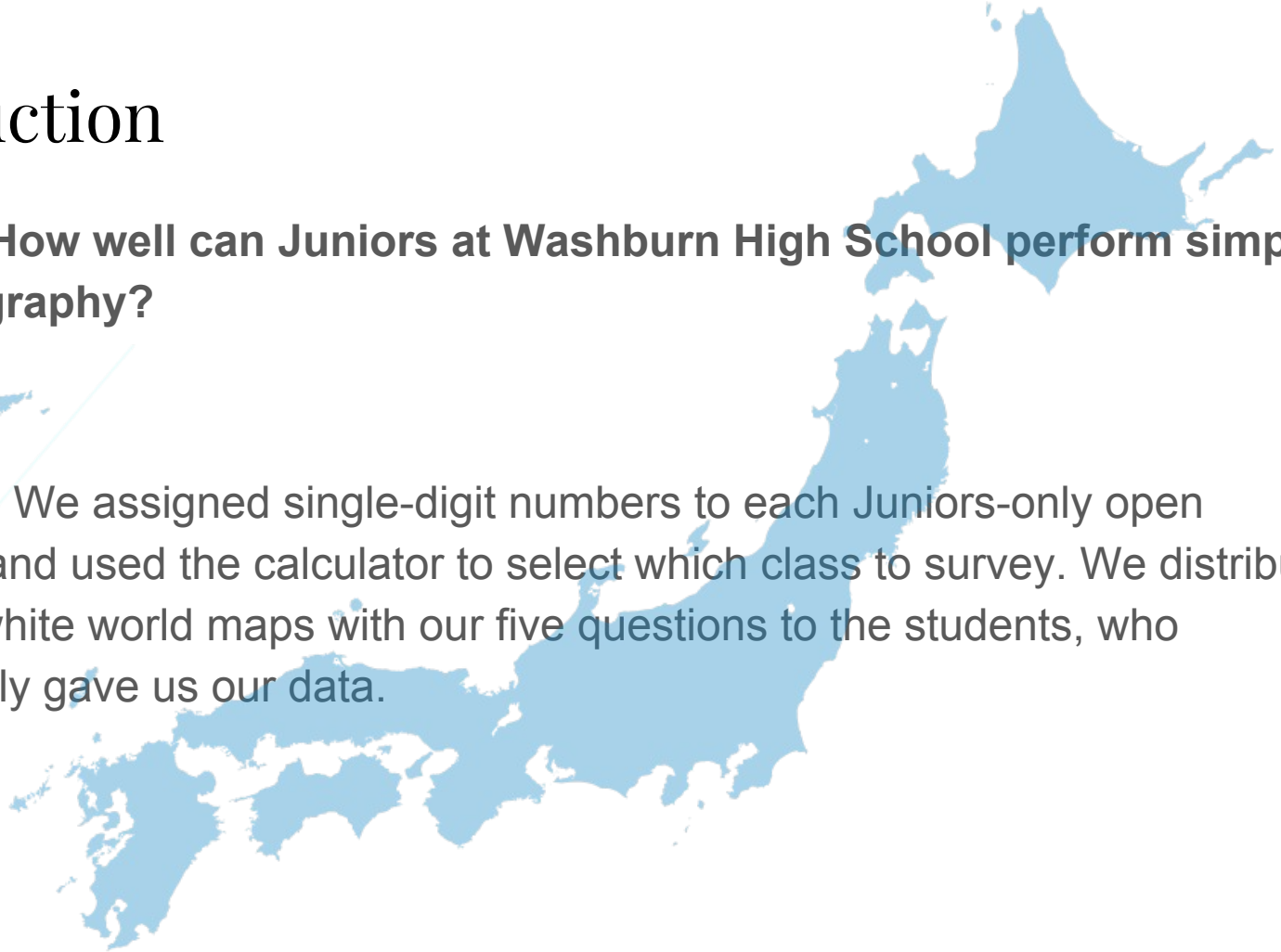
Simple Geography at Washburn High School

KALJU MAEGI & ALISIA WILLIAMS

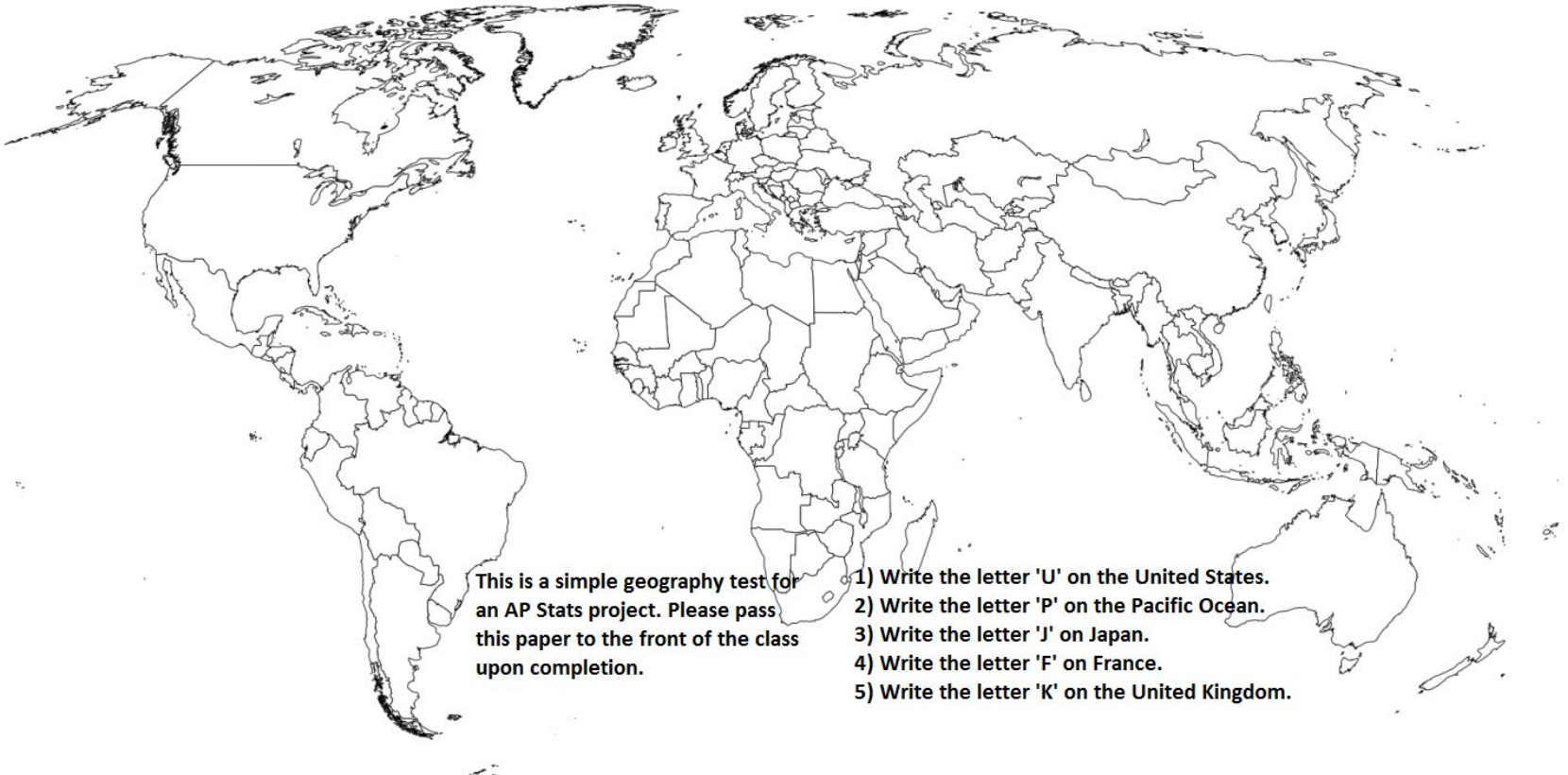
Introduction

Question - **How well can Juniors at Washburn High School perform simple world geography?**

Procedure - We assigned single-digit numbers to each Juniors-only open classroom and used the calculator to select which class to survey. We distributed black and white world maps with our five questions to the students, who subsequently gave us our data.



Introduction, continued

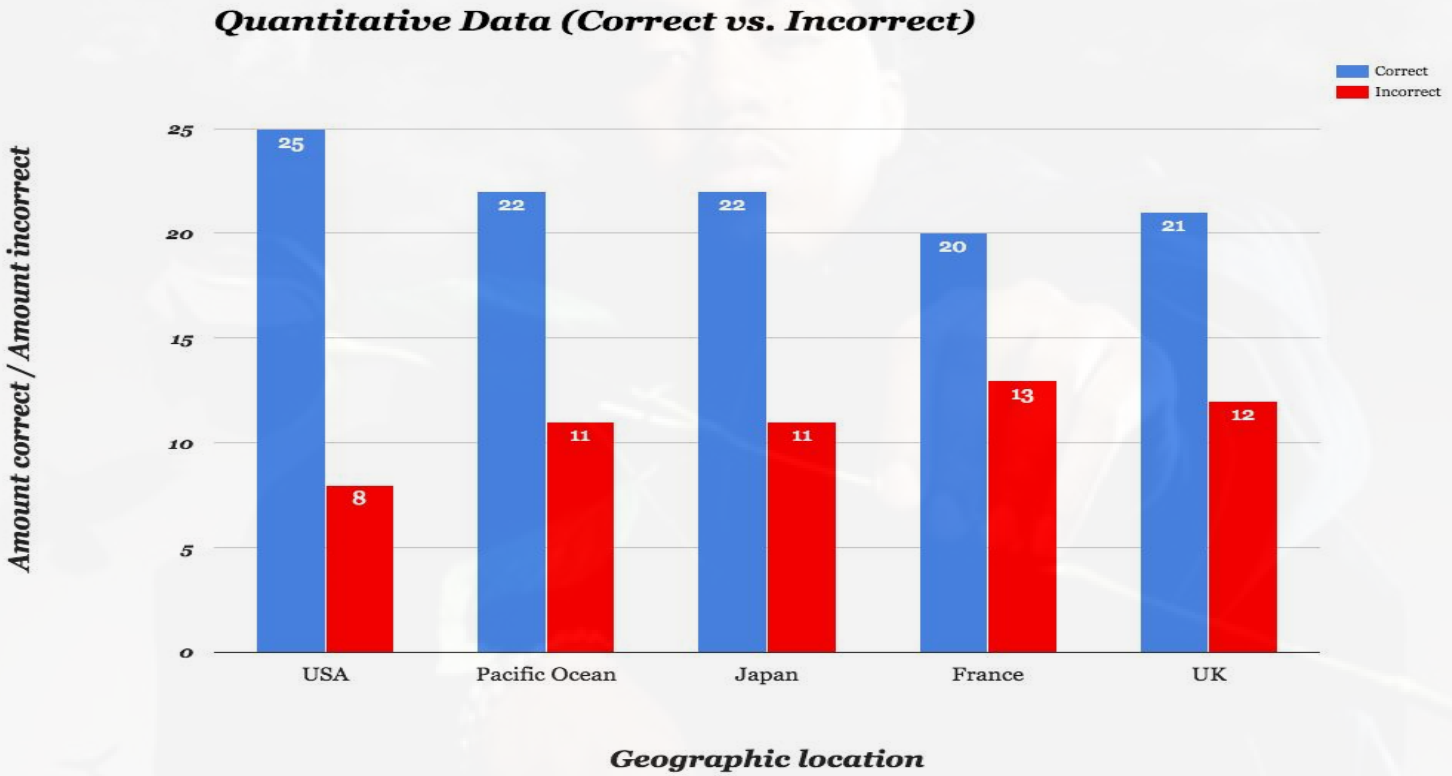


Raw Data

	Correctly pinpointed on map	Incorrectly pinpointed on map
USA	25	8
Pacific	22	11
Japan	22	11
France	20	13
UK	21	12

Raw Data, continued

	Percentage proportion Incorrect
USA	24% (.24)
Pacific Ocean	33% (.33)
Japan	33% (.33)
France	39% (.39)
UK	36% (.36)


Quantitative Data (Correct vs. Incorrect)
Correct
Incorrect
Amount correct / Amount incorrect
25
20
15
10
5
0
25
8
22
11
22
11
20
13
21
12
USA
Pacific Ocean
Japan
France
UK
Geographic location

Inference Procedure

A National Geographic study in 2002 revealed that 11% of High School Juniors in the United States could not point out the US on a blank map. A simple random sample of 33 Washburn Juniors were given a black and white map and asked to point out the USA. 24% of students were incorrect in their judgment. Is this sufficient evidence at the a = 0.05 level that Washburn Juniors are below par from national averages?

Inference Procedure, continued

P The proportion of all Washburn Juniors who cannot pinpoint the United States on a map

H Ho : P = .11

Ha : P > .11

Inference Procedure, continued

A Random – SRS via calculator (Math -> Prob -> Rand)

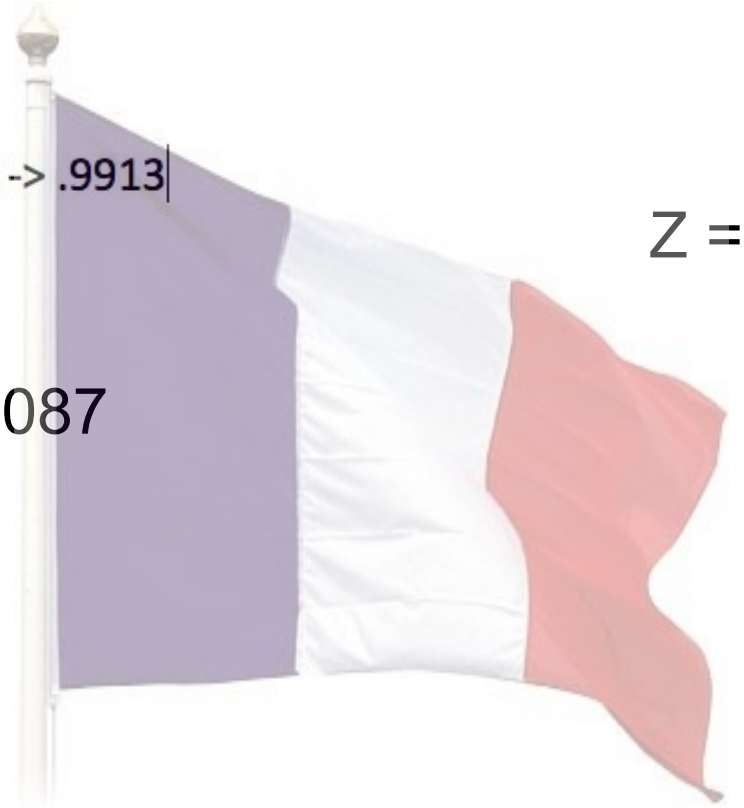
Normal – 33(.11) = 3.63

Independent – There are more than 330 Washburn Juniors

N – We will use a one-proportion Z test

Inference Procedure, continued

T – $Z = \frac{.24 - .11}{\sqrt{\frac{.11(1-.11)}{33}}} = 2.38 \text{ -> } .9913$

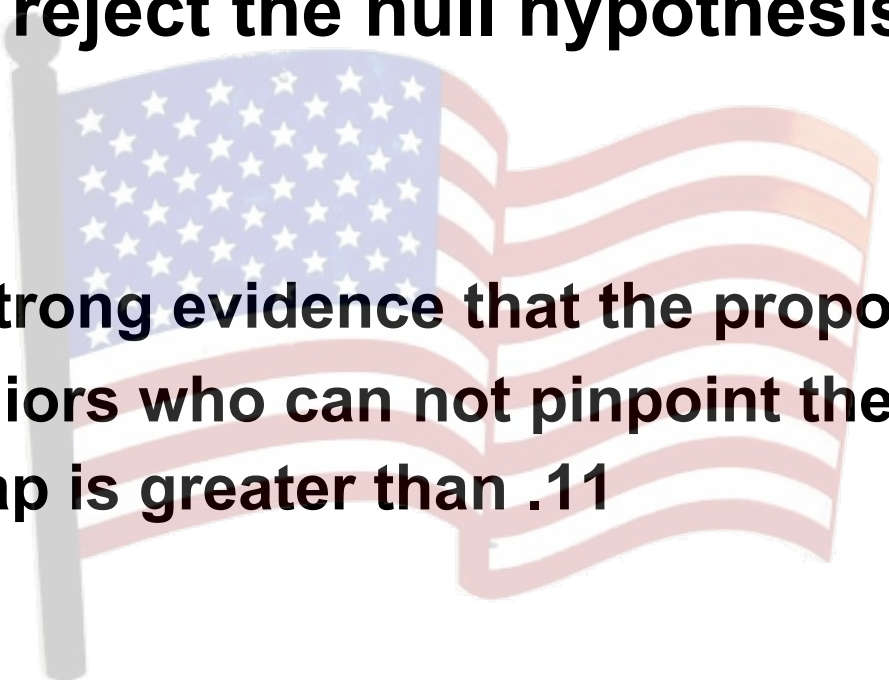


Z = 2.38 -> .9913

O – 1 - .9913 = .0087

Inference Procedure, continued

M – **Because the p-value is significant at the a = .05 level, we reject the null hypothesis.**



S – **There is strong evidence that the proportion of Washburn Juniors who can not pinpoint the United States on a map is greater than .11**

Complete Results (p-value in parenthesis) & Conclusions

USA - **Significant,** Washburn Juniors are *below* the national average. (.0087)

Pacific Ocean - **Not Significant,** Washburn Juniors are *up to par* with the national average. (.6950)

Japan - **Significant,** Washburn Juniors are *above* the national average. (.0018)

France - **Significant,** Washburn Juniors are *above* the national average. (.0009)

United Kingdom - **Significant,** Washburn Juniors are *above* the national average. (>.0002)

Final Data Comparisons

Area in Question	National Average of high school Juniors who **cannot** pinpoint area in question on a black and white map	Washburn High School Juniors who **cannot** pinpoint area in question on a black and white map
United States	11%	24%
Pacific Ocean	29%	33%
Japan	58%	33%
France	65%	39%
United Kingdom	69%	36%

Limitations and Error of Study

- We only surveyed one class (33 students)
- Students may not have taken the procedure seriously
- Some subjects failed to respond
- We only used five areas of interest, a more comprehensive study may yield better results
- Our data set was not normal
- Surveying an advanced class would most definitely yield increased results