Grade 7 Unit 7
Lesson 3 Anchor Problem 1

Random Numbers

Task A

Write down 5 **random** numbers between 0 and 9.

Review the results from Task A

As a class, collect a list of responses from Task A, and determine the frequency of each digit.

Discuss:

- What do you notice? What do you wonder?
- Which numbers appear most and least often?
- Did any (or many) sets include repeats such as 88 or 000?
- Did any (or many) sets include clusters like 789 or 321?

Digit	Class Frequency (##/total)	Expected Frequency out of 100
0	/	
1	/	
2	/	
3	/	
4	/	
5	/	
6	/	
7	/	
8	/	
9	/	

Task B

Use a random number generator to create a sequence of 5 random numbers between 0 and 9.

- Random.org provides many different random number generators.

Repeat this a few times, recording the results as a class.

What do you notice?

Task B (Sample results)

The list below shows results for 100 samples using a random number generator (RNG):

74809	14559	45226	46846	43571	42317	57660	57512
48554	00868	77708	39438	78657	72640	73676	89074
02032	56023	96817	51576	07095	20849	54672	18450
91861	83226	46108	55320	27123	69000	67529	73890
31249	64051	88869	99227	88373	17504	44042	74981
00569	46831	71933	12690	65654	01010	82993	41237
82589	44070	00070	70855	11045	98791	60406	82239
21284	91423	81504	93040	50821	62091	76520	78528
38054	26020	38486	05717	90764	32720	97576	11807
50569	80470	91489	55315	76291	91637	70203	04788
22824	87362	34401	79070	56368	38338	99693	86136
15125	34316	23632	66918	08297	30491	23089	94781
87947	62309	11289	62852				

Review the results from Task B

There are 500 total digits. You might expect each digit to show up about 50 times since there are 10 digits.

Additional analysis from this sample, out of 100:

- Side-by-side pairs of the same digit appeared 16 times
- Side-by-side sets of 3 of the same digit appeared 4 times
- Sequences up or down of at least 3 (such as '789' or '432', etc.) appeared 5 times

Digit	RNG Frequency
0	65
1	46
2	52
3	43
4	47
5	44
6	49
7	52
8	55
9	47

Comparison

Consider both sets of data (Task A and Task B) and compare the results.

Discuss:

a. What surprised you the most about the truly random samples?
b. How are the lists different?
c. If we used human-made samples instead of real random samples, how might that affect a survey or experiment?

Anchor Problem 1

What do these results show us about why random sampling matters in statistics?