



Mr. Roberts: Random integer . We want to do the random integer. Okay so when you guys hit rand int it says lower/upper what does that mean? Okay so lower is the lowest that you want to select from the upper is the where? The highest okay and what does N mean?

Student: The number of, uh, integers you want to select.

Mr. Roberts: The number that you want to select okay. So what happens if you repeat? Okay if you guys cleared your calculators let's, um let's seed your calculator real quick one more time so that you're not getting the same sample as someone else. Alright, in your calculator, okay. The very first thing that you kind of want to do is that you just want to type in some random number. Don't tell your friends! It's your own number don't look at mine! Just literally just make up numbers.

Student: (Mumbled question)

Mr. Roberts: Sure it could be one digit, two digit, three digit, mine's a lot of digits. Don't look! Okay so then you're going to hit the store button which is right here above the on button okay. Okay, it's an arrow and then hit math, and slide over to probability okay? And you'll see the number right - the first ones called Rand and you hit enter. Okay so now hopefully you guys won't get the same numbers from your algorithms as everybody else. Okay because really we can debate this whole word random right? With your calculators, but if they're seeded we all should be getting different numbers.

Hollylynn: Students use large whiteboards to plot the data from their samples.

Mr. Roberts: Yeah, hey for those that are waiting to plot, um, I sent you guys through a remind text, um, I sent you guys a form for you to fill out, um, it's asking you for the mean, the range, the standard deviation and the median of your samples okay. And next to each question it says the mean N equals 10, the mean n equals 20. If you're a 10-person put it in the N equals 10, if you're a 20 sample put it in the N equals 20 okay? Cool. This, when we graph it, I mean this is literally why we like looking at graphs right? Why we like looking at histograms and dot plots because now I can see what the data is doing correct? So, when I look at the heights you guys can tell me about what the range is right? I did max minus min. It's about 12. Okay. You guys know what the mean is. It's 67.96. Okay so when we have software, specifically when we have a graph you guys can tell me a lot about it now alright. And then when we have software that can crunch big data 'so to speak' like big for us alright. We can easily pull out some numbers to describe the height of whatever they're talking about. I'm going to collect - how many kids are in here? 30. Okay let's say that all 30 of you guys did a sample of ten okay? So look what I just got here okay. So this thing just did this okay let me see if I can pull this guide to the right okay. So I took out IQR I don't want to do it. Delete attribute okay. So what this did, okay, is this literally represents every single one of you okay? You pulled ten numbers from your population you randomly selected right in an SRS okay with

your calculator, some number generator and then what you guys did is that from every sample you collected a number correct. So this was a distribution of what?

Students: (mumbling)

Mr. Roberts: All the population of all the heights okay it's literally that sheet of paper right? It's this thing. Distribution - this is your population of heights correct? What is this guy? Distribution of your sample okay now from all the distribution of your samples to every all 30 of you collected four statistics that I asked you guys to collect right? Now the new thing that you guys are going to learn is this thing called a sampling distribution okay. It is literally a distribution of statistics. Do you guys hear the difference? Did I say heights? No. I said of a statistic right? So I'm going to take all thirty means alright? I only have like three up there but I'm going to take every single mean that you guys got and I'm gonna plot it okay. This is now a sampling distribution, a very limited one, but a sampling distribution so what does this dot right here represent? Let's just say at 69 what does that dot represent? What is 69?

Students: (mumbling)

Mr. Roberts: The mean of what? Of the sample right. This is like the cool part about this. Well I think it's cool. I'm going to do this 500 times okay. (To do do do) Awesome. So I took 500 samples out of this population okay. Of size what? Do you remember the size that we did? 10 okay everybody did a sample size of 10. 500 people sampled and all 500 of them filled out a Google Form and gave it to me. There it is. So if I only grabbed 10 of you guys I don't know as much if I grab 30 of you. I'm going to take 500 samples of size 30. We cool with that? So let's just say that like there's 500 of ya'll in here, aww man, you know. Every single one of you took a sample of 30 all right and found these four statistics. Look at it go. So every single one of these is a sample right? Every single one of those is a mean of a sample okay. Right okay. Are we okay with that? So, okay so let's kind of go through these questions because this is what I wanted to hit I don't know if I hit them all or not. So let's just make sure. Do we know what a sampling distribution is that word sampling distribution? Okay, distribution of samples, okay or distribution of statistics. Okay so it's our distribution of means, our ranges, our medians, our mins our maxes, our standard deviations okay. Alright you guys rock. Thank you.

Hollylynne: Let's hear from the teacher on how he decided to use technology to support students' learning.

Mr. Roberts: I think that they did, with the use of Fathom, I think it did come home pretty good.

Hollylynne: Uh-huh.

Mr. Roberts: And ultimately like this was nice I wanted to get them up and moving, but I really wanted to sample themselves.

Hollylynne: -Right, and I think they had, they had that experience.

Mr. Roberts: Exactly and they got to use a number generator to pull numbers and they got to fight in their heads this idea of what a sample is versus statistics cause they ask me like hey doing this and then people go up and do in the sample themselves helped out a ton when it came to doing the sampling distribution in Fathom.

Hollylynne: Em-hmm.

Mr. Roberts: Um, especially when I said this is all 30 of you and these are all the four numbers that each of you got, so let's plot those and then doing - okay well let's say there's 500 of y'all and plotting those and seeing that.

Hollylynne: Right, right.

Mr. Roberts: Um, and when they go over that PowerPoint tonight hopefully they'll connect things that we do in class with the PowerPoint.

Hollylynne: So you use a lot of different technology tools today.

Mr. Roberts: Yeah when I think about it I did, didn't I?

Hollylynne: You did! So how did you kind of decide and choose- I mean they were using the graphing calculators, they, um, you were using Fathom, you use the Remind app,

Mr. Roberts: Yep

Hollylynne: You know in the Google Form - How did you kind of think about how to pull that all together?

Mr. Roberts: Yeah, so I guess it just kind of went through my head of like what can I use to model the data. Um, what can I use to gather information and when you teach statistics the calculator is your go to. I know to use the random integer function, um, and then through just

like using Google Forms. I know that I can gather information quickly and that's what I wanted to do today is gather information quickly from them.

Hollylynne: Yeah

Mr. Roberts: So just blast it out, fill out a form, get all the information. Everything is nice and like I know who did ten, who did twenty, so I know I can compare those.

Hollylynne: Fathom.

Mr. Roberts: And then the Fathom like that's just that's just for me. I've actually, liked, taken time out to learn that and so that's just nice just to have a really quick way to model data which is awesome because I've used it for some of the past chapters, especially in descriptive statistics that's amazing for. Because you just throw data up on a, on a-

Hollylynne: Em-hmm, em-hmm

Mr. Roberts: Histogram, boxplot, dotplot, you can, you can go like this (snapping fingers) and you can really challenge them and say okay which one is better? And they have to justify their response. Or which, what does this give you like, what information. So we've done it before using Fathom.

Hollylynne: Em-hmm.

Mr. Roberts: So entering in the sampling distribution and that's talking about describing sampling distributions it just kind of flows so.

Hollylynne: Cool.

Mr. Roberts: Yeah.