GCSE - Numeracy and Mathematics	Tier: Higher	Grade: A/A*	
Topic: Sampling			GwE

Starter:

Which method is most likely to produce a random sample of the members of your class?

a. listing the first six students that come to mind

b. choosing the five oldest students in the class

c. writing the name of each student on a separate piece of paper and then drawing these slips from a hat

d. selecting the first six students to arrive at class

Top Tips!

There are three types of sampling you need to learn.

Stratified sampling: A stratified sample takes account of the proportion of people in a survey and allows the same proportions to be represented in the sample (ie different age groups in a population)

Random sampling: A random sample means every possible participant has an equal chance of being selected.

Systematic sampling: This involves starting at a particular point, usually the first entry, and selecting every nth person from then on. For example, if there was a list of 30 people questioned, a systematic sample may look at every 5th person.

To find a **stratified sample**, you just need to divide the amount in the 'tier' by the whole population, then multiply by the amount you need in the total sample. Ie if you want a sample of 320 students from a school of 1200 students and there are 150 students in year 8, then 150 ÷ 1200 x 320 = 40, therefore you would need 40 students from year 8.

Examination Question:
2016 November Numeracy U2 Higher Q6

Porth Ifan Hospital has made some changes to improve patient care.

A survey is to be used to find out the views of the hospital staff.

a) The table shows the total number of staff in each job type.

Job type	Doctor	Nurse	Management	Clerical
Number of staff	120	320	56	144

The survey is to be given to a sample of 75 staff.

Use a stratified sampling method to calculate the number of staff from each job type that should be asked to complete the survey.

You must show your working. (4)

Job type	Doctor	Nurse	Management	Clerical
Number in sample				

b) The hospital decided to take a random sample of its 120 doctors to select those needed for the survey.

Use the following list of random numbers to select the first **5 doctors**.

You must start with the first number in the list, explaining clearly how you are using the numbers to select the sample. (3)

032	520	021	924	152	627	351	295	081	495
542	708	339	557	396	949	417	235	962	261
837	783	983	493	876	924	032	421	205	740
055	491	806	415	158	392	441	521	105	342
782	398	923	729	968	244	119	480	451	780

Assessment for Learning

Video / QR code

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Total staff = 120 + 320 + 56 + 144 = 640

Number of staff needed:

$\frac{120}{640} \times 75 = 14.06 = 14 \ Doctors$

$\frac{320}{640} \times 75 = 37.5 = 38 \ Nurses$ (change to 37 to ensure total is 75)

$\frac{56}{640} \times 75 = 6.56 = 7 \ Management$ staff

$\frac{144}{640} \times 75 = 16.875 = 17 \ clercial$ staff

Check: 14 + 38 + 7 + 17 = 76

Job type	Doctor	Nurse	Management	Clerical
Number in sample	14	37	7	17

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Number all the doctors from 1 to 120 (giving them a three digit number)

Use the random numbers by counting every three digits and picking the doctor with that number.

032 – choose the 32nd Doctor

021 is the next three digit number less than 120, so choose the 21st Doctor

081 – choose the 81st Doctor

032- IGNORE as already used the 32nd Doctor

055 – choose the 55th Doctor

105- choose the 105th Doctor

Assessment for Learning

Video / QR code