

An apartment building has nine floors and each floor has four apartments. The building owner wants to install new carpeting in eight apartments to see how well it wears before she decides whether to replace the carpet in the entire building.

The figure below shows the floors of apartments in the building with their apartment numbers. Only the nine apartments indicated with an asterisk (*) have children in the apartment.

11*	12	21	22*	31	32	
1st Floor		2nd Floor		3rd Floor		
14	13	24	23*	34	33	
41	42	51*	52	61	62	* = Children in the apartment
4th Floor		5th Floor		6th Floor		
44	43	54	53	64	63	
71	72	81	82	91	92*	
7th Floor		8th Floor		9th Floor		
74*	73*	84*	83	94	93*	

- a) For convenience, the apartment building owner wants to use a cluster sampling method, in which the floors are clusters, to select the eight apartments. Describe a process for randomly selecting eight different apartments using this method.
- b) An alternative sampling method would be to select a stratified random sample of eight apartments, where the strata are apartments with children and apartments with no children. A stratified random sample of size eight might include two randomly selected apartments with children and six randomly selected apartments with no children. **In the context of this situation, give one statistical advantage of selecting such a stratified sample as opposed to a cluster sample of eight apartments using the floors as clusters.**