



Some Thoughts and Principles for Inclusive Mathematics Question Writing

1. Avoid male as default.

- a. There can be an easy tendency, when writing a maths question where the gender doesn't matter, to choose a male name or male pronouns for the protagonist of the question. It can be powerful to us consistently female (she/her) or gender neutral (e.g. they/them) pronouns for the protagonists of questions that you write – or that you source from elsewhere.
 - i. For instance, this writer recently changed the gender of a skydiver team leader in a mechanics question from male to female when writing up the question to give as homework. It is interesting when you do this sort of thing, because very often there will be a student who in their answers identifies the protagonist as male anyway. This is, as they say, a “teachable moment”. It's a good opportunity to get a student to consider why they expected, e.g., the team leader to be male. Subverting the unconscious expectation of students creates small moments in which positive change can be effected.

2. Consider implicit assumptions in problems.

- a. Here is a maths problem:

There are five men and five women at a dinner party. The group contains 5 married couples. How many possible configurations of marriage could there be?

What is the problem here? The assumption may well be (perhaps it was for you) that of course every man is married to a woman and every woman is married to a man. This may not be the case! These sorts of questions (often involving seating couples round a table) are very common in contexts like combinatorics. But they reinforce a heterosexuality-as-norm outlook that it might be good to avoid. You could pose this question and raise this discussion with the students! Equally, these questions are easily re-phrased. For instance:

I own five sheep and five pigs. None of the pigs are friends with each other, none of the sheep are friends with each other, and each pig is friends with exactly one sheep and vice versa. How many possible configurations of friendships?

3. Consider inclusive contexts for statistical investigation.

- a. For example: a common topic of study in statistics is how to perform reliable statistical sampling and infer things about a wider population from those samples. A perfect example of a real world place in which this comes up is estimating the numbers of LGBT+ people in the population. Various studies seem to come up with a variety of percentages for this: why might this be? What issues might be associated with trying to estimate such a proportion? How do you define "LGBT+": is it based on self-identification alone? This could be just one of several examples you consider but it is one that should provide natural places for discussion.
- b. Another example is hate crime reporting. There's a report here: (<http://www.galop.org.uk/wp-content/uploads/2013/08/The-Hate-Crime-Report-2013.pdf>) on hate crimes (specifically homophobia, biphobia, transphobia) in London, which has some interesting statistical discussions, associated with it. If the rate of reported hate crimes goes down, does this mean that actual incidence of hate crimes have gone down? How does this relate to confidence in the police? This could extend beyond LGBT+ hate crimes into looking at wider hate crime reporting, e.g. racially motivated crime. It is a good opportunity for discussion about the importance of rule of law, etc. – i.e. part of the requirement to promote British values.

4. Think about the inclusive use of names.

- a. This dovetails with avoiding male as default, but goes more broadly. Maths questions often are full of protagonists transporting chickens across rivers, playing with broken chessboards, etc. All good mathematical fun. Consider: do the protagonists of the maths questions you set represent the students who will solve them and society more widely?
- b. One key codifier of representation is name use. Make sure that male-coded and female-coded names are used in equal proportion. More widely, do the names you use reflect the backgrounds of your students? A good way to fix this sort of thing is to feature your students in your questions if you must name a name – and it often goes down well! Try to keep names varied: don't just have a small stock of names you rely on: this applies to representation of all groups.