IDEA 34

TURNING INSIDE-OUT

This problem is one I would describe as a 'closed' problem yet is another active task that has potential for fun and laughter, particularly if the performers do not solve the problem too speedily. This might sound to run contrary to what students are mainly intended to do in classrooms – correctly solve problems. However, if engaging with a spot of stuckness can occur simultaneously with enjoyment and all in the name of learning mathematics, this will do for me.

Ask five or six students to stand holding hands in a ring facing inwards. The challenge is for students to turn themselves inside-out, without letting go of any hands, so they remain in a ring and face outwards (without having their hands crossed-over).

My funniest moment with this idea was working with a Year 8 group when they got themselves into a real tangle.

As students solve this problem, which is not actually that difficult to work out, they can try to solve it for different numbers of people in the ring.

Once a solution is realized the following questions can be posed:

- Can students find a way of describing the process using symbols and diagrams?
- Can students generalize the situation for n people in a ring?

IDEA 35

X + Y = 10

Ask volunteers to come to the board/screen and write pairs of positive whole numbers that add up together to make 10.

Once a collection of answers has been generated students can a) write the results in an ordered way, or b) turn the pairs of values into coordinate pairs and plot them on a graph.

Once this graph has been drawn further questions might be:

- What if one of the values is $4\frac{1}{2}$? Does 'this' point, i.e. $(4\frac{1}{2}, 5\frac{1}{2})$, also live on the graph?
- What if one of the values is 3.8? Where does this point lie on the graph?
- How many different answers are possible now?
- What happens if one of the two numbers is 13? Now what happens to the graph?
- What if the problem is to find two numbers that add up to 11? What happens with this graph? How do the two graphs compare?
- How can the graphs be described algebraically?
- Suppose the problem was: One number subtract another number is equal to 5. What does the graph of this situation look like?
- What about: One number subtract another number is equal to negative 5? What does this graph look like?