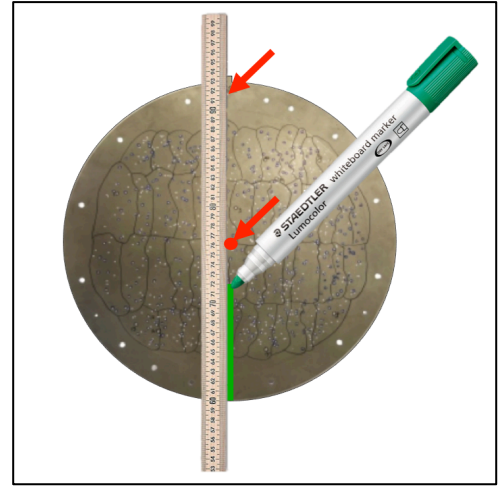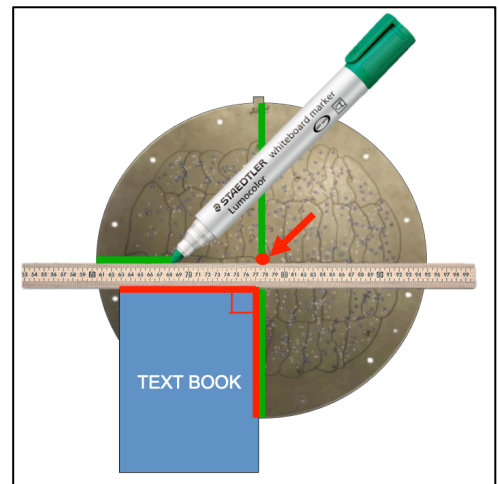# Creating Axis on your Plate

*Note: for clarity, all diagrams are not to scale*

1. Place the plate face up on a desk with the tab at the top.
2. Locate the hole directly below the tab
3. Locate the hole in the centre of the plate. It should be slightly larger than the other drill holes on the plate. If you have trouble locating this hole, try the alternative method for creating the axis, this can be found on the next page.
4. Using a meter stick and a whiteboard marker, draw a line that passes through these two holes and continues the diameter of the plate.

5. Using a large setsquare or a textbook with a right angle corner, draw a second line perpendicular to the first. Ensure this line also passes through the central hole on the plate.

6. These are the axis on your plate. The horizontal line is the x-axis, and the vertical axis is the y direction.
Note: The values on the x-axis increase from left to right. The values on the y-axis increase from top to bottom.
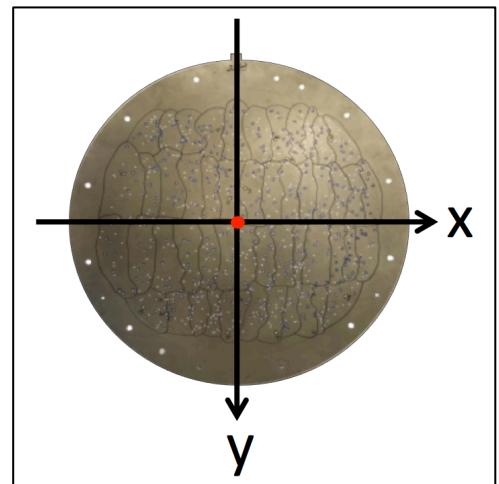
This is a simplified method of creating axis on your plate. For a more detailed method try the alternative method that can be found on the next page.

Challenge
Try to think of another method you could use to find the centre of the plate and draw the axis
… without using the central hole!

Creating Axis on your Plate – An Alternative Method

Note: this is just one way out of many to do this!

7. Loop some string through the small hole at the top of the plate (below the tab). Using this, hang the plate from a chair, or a door handle, or anything that is high up, and strong enough to hold the plate up.
8. Tie a small weight to the end of another string or thread, and tie this to the same hole. Make sure the string is longer than the diameter of the plate.
9. Use a whiteboard marker to mark where the string hits the bottom of the plate
10. Once you have marked the bottom of the plate, take the plate down and remove the strings. Plate the plate on a table, front side up.

11. Wrap a piece of string around the plate (make sure this string is not stretchy! Thin wire would also work) and mark, with a pen or small piece of blue tack, where the two ends of the string meet, this marks the circumference of the plate. Mark the bottom of the plate on the string too.
12. Remove the string from the plate and fold it in half at the bottom mark on the string. Then fold this in half again, so the circumference of the plate is quartered. Mark the quartered points onto the string.
13. Wrap the string back around the plate, lining up the marks at the top and bottom, then mark onto the plate, each quarter of the circumference using a white board marker. Remove the string.
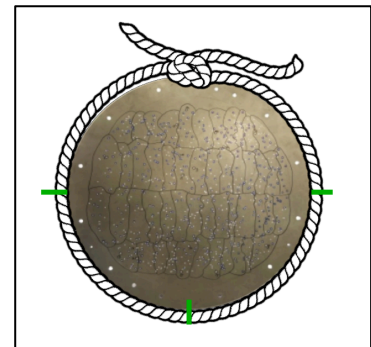
14. Using a meter stick and a whiteboard marker, draw a line from the top of the plate to the bottom. The line should begin at the hole just below the tab, and end at the mark that is drawn at the bottom of the plate. It should pass through a slightly larger hole in the centre of the plate. If it does not, then adjust the meter stick so that the line will pass directly over this central, larger hole and the hole at the top.
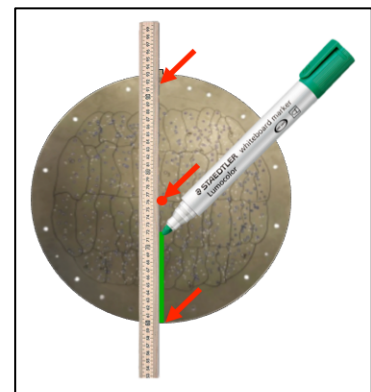
15. Draw line perpendicular to the first that passes through both of the marks at the side of the plate and the central hole. Use a textbook or setsquare to ensure the lines are perpendicular.
16. These are the axis on your plate. The horizontal line is the x-axis, and the vertical axis is the y direction.
Note: The values on the x-axis increase from left to right. The values on the y-axis increase from top to bottom.
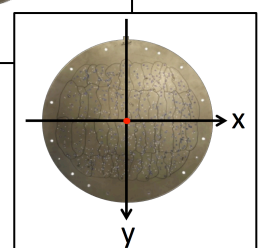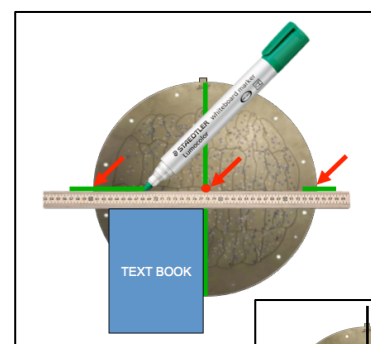
Locating Objects on the Plate

1. From the central hole on the plate (e.g the origin on your axis) measure the x and y coordinates of your object with a different coloured whiteboard marker. Remember, the y coordinate is measured down from the origin, so negative y coordinates will be at the to top of the plate. Positive y, at the bottom of the plate.
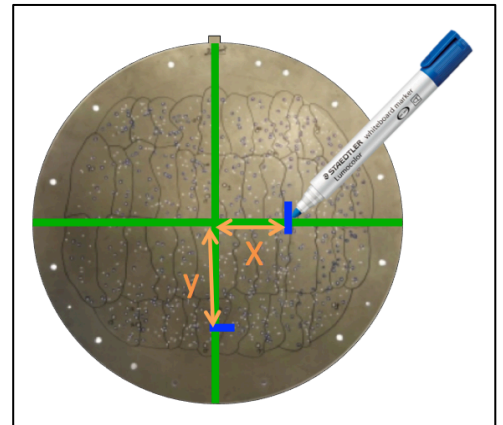
2. Using a setsquare or large textbook with a right-angled corner, draw lines from both coordinate marks that are perpendicular to the axis they are marked on. Make sure these lines intersect. The point where the lines intersect should be on, or close to, a hole on the plate. This hole is the hole corresponding to your object.
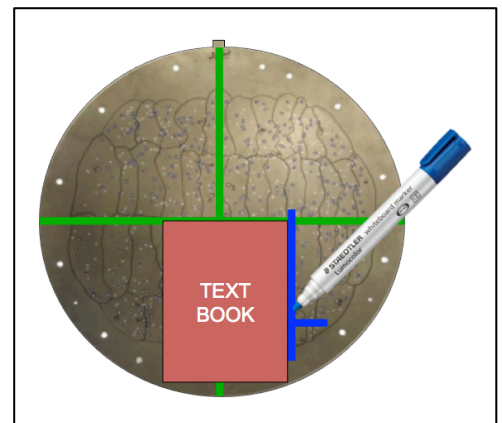
3. Mark this hole with masking tape, ensuring it is clear which hole it is. You may want to put tape all the way over the hole and then punch a hole through the tape with a pen where the hole is.
4. Label this hole by writing a letter, or your initials, on the piece of masking tape.
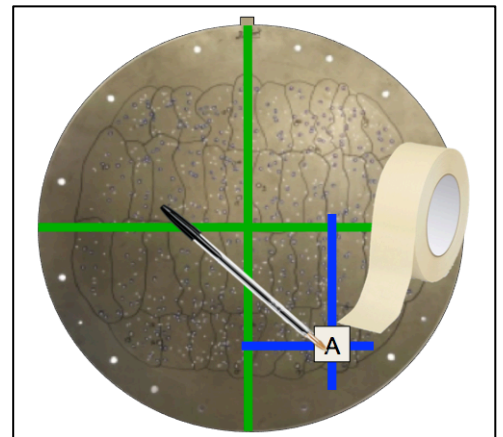
5. Once you have marked your objects hole with tape, wipe away the whiteboard marker lines that you used to find it. This will make it clearer for others to find holes on the same plate.
Make sure you do not wipe off the axis lines you drew on earlier.