Reflective Practice

1. **Title of the lesson**: Equacirc: The Equation of the circle

2. **Brief description of the lesson**: The lesson will begin with checking student's previous knowledge on co-ordinate geometry of the line, so they should tell us different formulas used in this chapter. We will then look at students knowledge on a right angled triangle, by giving students a right angled triangle with two sides marked and they have to find the third. We then plan to get the students to draw a circle using graph paper, given a point (3,4) and the centre (0,0). Once students have completed this task we will get them to find the radius of the circle using as many methods as they can. Students will then be asked to come to the board to demonstrate their methods. Student will then be given the task to pick out points on the circle which they have drawn, with this students should then be able to check the radius is the same all the way around the circle. We will now compare the point (3,4) to (x,y) and bring all that they have learnt together and hopefully they will come up with the formula for the circle. Finally we will ask students what they have learnt today and give them their homework.

3. **Aims of the lesson:**
   For students to connect synthetic geometry and algebra
   To improve students psychomotor skills

4. **Learning outcomes:** As a result of studying this topic students will be able to understand that the deviation of the formula for the equation of the circle is based on Pythagoras theorem.

5. **Background and rationale:** i) To recognise that $(x-h)^2 + (y-k)^2 = r^2$ represents the relationship between the x and the y co-ordinates of the points on the circle with centre (h,k) and radius r. ii) Students sometimes struggle with inputting the centre into the equation. iii) Structured problem to derive the equation.

6. **Research**: Project maths website, text book

7. **About the Unit and the Lesson**
   - To start students will be asked to draw a circle using centre (0,0) and the point (3,4).
   - The students will then be asked to find the radius. (previous knowledge will lead them to use the distance formula or Pythagoras' theorem)
   - Then students will be asked to check if the radius is the same all the way around. (using a few different points)

- This will lead to a pattern which should give students the equation of the circle.

8. Flow of the Unit:

Lesson		#of lesson periods
1	Equation of the circle (with centre (0,0))	1
2	Investigating if points are inside outside or on the circle	1
3	Translating the centre of the circle to centre (h,k)	1 to 2
4	The intersection of a line and a circle	1
5	Getting the tangent to the circle	1 to 2

9. Flow of the lesson

Teaching Activity	Points of consideration
1. Introduction Check student's previous knowledge. Ask them what a radius is. How to find the length of a line and what information they know about different shapes.	We are looking for the formulas from the students such as the distance formula and Pythagoras theorem. We will have to go through other formulas in order to get the ones that are required for this lesson.
2. Posing a task: Task 1: We will give the students a point (3,4) and the centre point (0,0) and ask students to construct a circle. Task2: Students will have to find other points on the circle and check if the radius is the same all the way around the circle.	We will be checking to see if the students can recognise that using different points, the radius will be the same all the way around the circle. If students recognise this they should be able to proceed to find the equation of the circle.
3. Anticipated student response: We expect that students will try measuring the radius by using a ruler. They may also use the distance formula or some may decide to use Pythagoras' theorem.	
4. Comparing and discussing: Students will then compare the different methods of finding the radius, measuring with a ruler, using the distance formula and Pythagoras' theorem. This will show which method is more accurate.	

10. Evaluation:

There will be three observers along with the teacher; the observers will record instances of:

- Students developing different methods to find the radius.
- Students coming up with a pattern or relationship between points on the circle and the radius length and also between the x and y co-ordinate.
- Evidence: There will be photos of the students work and board.
- Language that they used when questioned on their method.

Board Plan