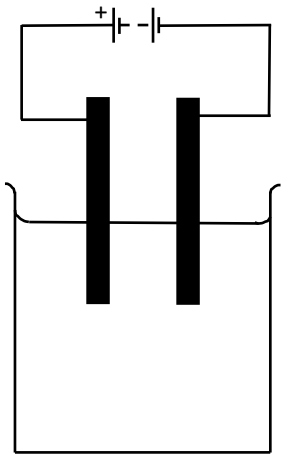
Complete these questions before the practical:

1. Label the electrolysis apparatus below using the key words in the box.

cathode	**anode**	**electrolyte**	**cation**
anion	**cell**	**beaker**	**an inert material**

Stretch: Use arrows to show the direction of the flow of current in this circuit.



2. Complete this table to describe any hazards associated with this practical, and the precautions that you will take to keep yourself safe.

Hazard	**Precaution**	**If an accident happens, what should I do?**

3. **Describe a hypothesis** for the electrolysis of copper (II) chloride solution.

*This hypothesis might be about **what you will observe**, or **what will be formed** during the electrolysis investigation.*

My hypothesis:

_____

_____

4. **Explain your hypothesis** using scientific ideas about electrolysis.

Think about why you have made this particular hypothesis. Don't forget to include any equations that will help you to explain your hypothesis.

5. Record the mass of the anode and cathode before the practical.

Mass of anode:

Mass of cathode:

Complete these questions throughout the practical:

1. State the name and formula of the electrolyte that you are using.

2. List all of the ions that are present in the electrolyte.

3. Describe what you expect to observe if your hypothesis is correct.

At the anode:

At the cathode:

4. **After you have switched on the current for 2 minutes**, describe what you observe.

At the anode:

At the cathode:

5. Use your answer to question 4 to **suggest** and **explain** which ion has been discharged at each electrode.

At the anode, I think that the ion discharged is:

This is because

At the cathode, I think that the ion discharged is:

This is because

6. *(HT only)* Write a half equation to describe the discharge of ions at each electrode.

At the anode:

At the cathode:

7. **After the current has been switched off and unplugged**, carefully dry the electrodes and measure their mass.

Mass of anode after electrolysis:

Mass of cathode after electrolysis:

8. Describe the change in mass of electrodes. Refer to the measurements you made before electrolysis started.

9. Explain the change in mass of electrodes (if there was a change in mass)

10. Circle the correct answer.

    My hypothesis was **correct/incorrect.** I know this because…

Complete these questions after the practical:

1. A student made a hypothesis, shown below.

"The product at the negative electrode is always a metal when salt solutions are electrolysed using inert electrodes."

(a) Explain why the hypothesis is not completely correct

_____

_____

(b) Describe how this hypothesis would be tested.

Include the independent and dependent variables.

_____

_____

_____

_____

(c) State what would be produced at the positive electrode when the following solutions were electrolysed:

Copper sulfate solution _____

Potassium fluoride solution _____

2. Silver nitrate solution can be electrolysed using inert electrodes to extract silver.

The silver produced during electrolysis fell from the electrode and settled at the bottom of the beaker.

(a) State what was produced at the negative electrode.

_____

(b) (HT Only) Write a half equation for what was discharged at the negative electrode.

_____

(c) Describe a separating technique that should be used to separate the silver from the mixture.

_____

_____

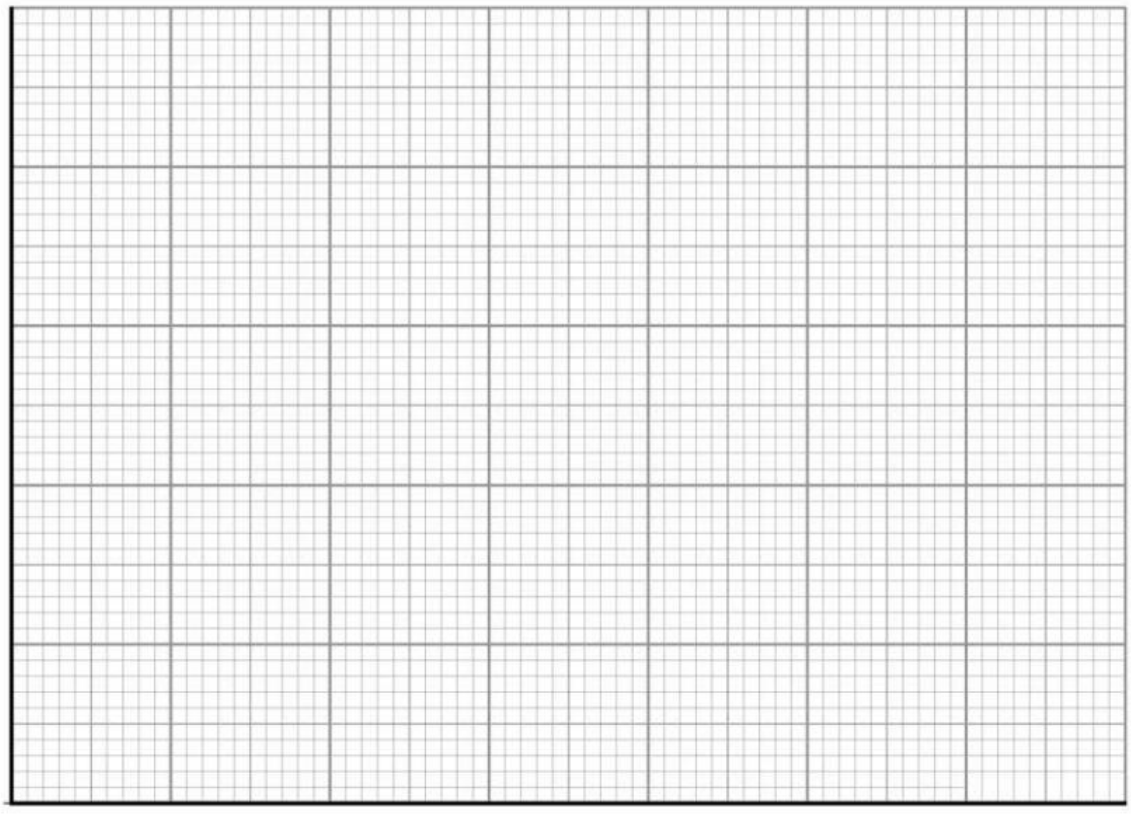
This electrolysis experiment was repeated for different durations to investigate how the length of time the solution was electrolysed, affected the mass of silver produced.

The results are shown below.

Time (min)	Mass of silver (g)
0	0.0
5	0.6
10	1.1
15	1.7

(d) Plot these results on the graph paper below.

You should:
- Include axes labels
- Use appropriate scales
- Draw a line of best fit



(e) Using the graph, describe the results from this investigation.

_____

_____

_____