**Name: Date:**

**DATE: Monday, September 29 (Maroon 3) or Tuesday, September 30 (Gold 2/Gold 4)**

**Key aims**

This practical is designed to assess the skills of decision-making, observation, interpretation and evaluation in relation to testing for biological moelcules.

**Intended learning outcomes**

By the end of this practical the student should be able to:

1. Decide what tests to carry out and what observations to make
2. Use an appropriate means to record your observations, constructing tables before you make the observations
3. Describe and summarize the key points of your observations
4. Draw conclusions in terms of the presence or absence of different chemicals  in the solutions
5. Suggest alternative strategies for identifying some of the materials

**Task: You will be given a test tube of unknown solution and will have thirty minutes to determine which macromolecules it contains.**

***\*\*\*DUE MONDAY/TUESDAY: Preparations and making observations***

1. ***You need to decide what tests to do and in what order so that it is possible to minimize amount of supplies used and maximize efficiency. Write-out your procedures***
2. ***Decide how you are going to record your observations so that it will be absolutely clear what you did to which solutions, what you observed and your interpretation of the observations. Prepare a results table***
3. ***Make a risk assessment of your proposed methods and decide what precautions to take to reduce the likelihood of an accident and to reduce the damage any accidents might cause – ask your teacher to confirm that you may go ahead with the tests.***

**On Day of Lab Practical:**

1. Carry out the tests with full regard to safety, recording your observations and interpretations.
2. Record the identity of the unknown solution.

Write-up

1. hand in your original laboratory records, including your methods, observations and interpretations.
2. suggest improvements to the method including some of the following:
	* any experimental errors,
	* starch would also be hydrolyzed by acid. Suggest a better order to do your tests if this caused you difficulties,
	* ways to increase the efficiency of testing for macromolecules

**OVERVIEW:** You will be assessed on the following:

1. Experimental design: Effective pre-planning- **10 points**
	1. Description of procedures for the experiment including any applicable diagrams
2. Experimental Techniques: Safety and Conservation of materials- **4 points**
3. Data/observations collection- **6 points**
4. Analysis and conclusion- **10 points**
	1. Correct identification of unknown
	2. Supports claim with data
	3. Error analysis

**Specific Points received by category:**

|  |  |
| --- | --- |
| **Experimental Pre-Planning** | **Points** |
| 1. Procedures written BEFORE class
 | 5 |
| 1. Procedures written with concern for safety
 | 1 |
| 1. Procedures include specific quantitative amounts
 | 1 |
| 1. Procedures include specific scientific apparatus names
 | 1 |
| 1. Procedures are easy to follow and easily replicable
 | 1 |
| 1. Procedures designed to correctly identify the unknown without assistance from teacher
 | 1 |
|  | Category total: | **/10** |
| **Experimental techniques** |  |
| 1. Safety
 | 3 |
| 1. Conservation of chemicals
 | 1 |
|  | Category total: | **/4** |
| **Data/observations collection** |  |
| 1. All observations recorded (before/after), beyond those of color
 | 2 |
| 1. Appropriate observations table made to record all results in single table; made with ruler; all edges/boundaries enclosed with lines
 | 4 |
|  | Category total: | **/6** |
| **Analysis and conclusion** |  |
| 1. Correct identification of unknown
 | 2 |
| 1. Supports claim with data
 | 4 |
| 1. Discusses any anomalous results
 | 1 |
| 1. Error analysis: extends beyond that of human error
 | 3 |
|  | Category total: | **/10** |