



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2019

LIFE SCIENCES: PRACTICAL ASSESSMENT TASK

INSTRUCTIONS TO TEACHERS AND LABORATORY TECHNICIANS

IT IS IMPORTANT THAT TEACHERS READ THROUGH **THIS ENTIRE SET** OF INSTRUCTIONS CAREFULLY AND WELL AHEAD OF THE PAT.

This PAT is written at 10:00 on Wednesday 18 September 2019. It is essential that all workstations and equipment are tested and ready ahead of candidates entering the venue.

This is an open-ended practical, and as such, results can be HIGHLY variable from one school to another and also from one candidate to another. There is no CORRECT result for this investigation. It is imperative that candidates write up and discuss EXACTLY the results they get. They MUST NOT try to guess the result and make their data "fit" the expected result.

- Do **NOT** share any of this information with your candidates. It will be considered an irregularity if you should do so.
- Do **NOT** open the PAT packs before the day of the PAT.
- Do **NOT** try the experiments out first or adjust any of the instructions or volumes/ amounts of chemicals.

You may **NOT** run successive sessions in order to accommodate all the candidates on an individual basis. This PAT must run at the same time for **all** candidates. It is designed so that it can be carried out in any venue and may be invigilated by Life Sciences teachers. Invigilators are to be carefully briefed before the PAT on how to complete the grid for procedural and manipulative skills.

SPECIAL ATTENTION IS DRAWN TO THE INSTRUCTIONS (AT THE END OF THIS DOCUMENT) TO BE GIVEN TO INVIGILATORS SO THAT THEY CAN PERFORM THEIR DUTY ON THE DAY.

The security bag containing the scripts will be opened by the chief invigilator 45 minutes before the commencement of the PAT. This will give the Life Sciences teacher enough time to prepare the invigilator(s).

The venue(s) with the workstations must be prepared in good time so that the candidates can start their PAT promptly at 10:00 on 18 September 2019.

A workstation with the following equipment and solutions must be prepared for every individual candidate:

- five identical beakers or containers
- a beaker or container labelled "PVSA"
- pipette or dropper
- 10 ml syringe
- 20 ml syringe
- saline solution in a cup or beaker labelled "Saline"
- polystyrene cup or beaker containing 100 ml tap water for rinsing labelled "Rinsing Water"
- ballpoint pen (with removable ink) or straw or glass tube
- dissecting needle/forceps
- paper towel
- permanent marker
- one A4 sheet of plain white paper
- access to a wall clock or watch
- stirring rod or kebab stick
- one Petri dish with a blue gel

NOTES ABOUT THE APPARATUS AND MATERIALS

The items listed below are to be set out for **each** candidate at a dedicated workstation.

Beakers/Containers – make sure that five beakers are each able to hold 100 ml of liquid.

PVSA – beaker or container with 70 ml 50% glacial acetic acid (available from your chemical supplier) labelled "PVSA". 50% glacial acetic acid is prepared by diluting glacial acetic acid in a ratio of 1:1 with distilled water (e.g. 50 ml GAA + 50 ml dH₂O)

Pipette or dropper – each candidate must have a plastic pipette (as shown below) or dropper.



[Adapted: <<https://pasteur-pipette.com/range/graduated-pasteur-pipettes>>]

10 ml and 20 ml syringes – these can be obtained cheaply from your local pharmacy or chemical supplier. Have some spares available in case some are problematic. Each candidate must have a 10 ml and a 20 ml syringe.

Saline solution – made by dissolving 10 g sodium chloride in 1 000 ml distilled water. Each candidate will require 250 ml saline solution in a beaker or container labelled "Saline".

Tap water – polystyrene cup or beaker containing 100 ml tap water for rinsing labelled "Rinsing Water".

Plastic pen tube or straw (any type) or glass tube – available at supermarkets or local stationery shop or chemical supplier. If using a pen tube, see image below. The ink cartridge will not be necessary for the PAT. Brands such as Scripto® or Artline® produce cheap disposable ballpoint pens. Each candidate needs access to a pen/straw/glass tube (may be shared among candidates).



Dissecting needle/forceps – each candidate needs access to either a dissecting needle or forceps (may be shared among candidates).

Paper towel – have spare towels available in the venue.

Permanent marker – any brand of marker. The candidates may be asked to bring their own.

One A4 sheet of plain white paper.

Access to wall clock or watch – each candidate must be able to see a wall clock or a watch (or other timing device – cell phones and other electronic devices are not permitted.)

Kebab stick or stirring rod – each candidate must have their own kebab stick (available from local supermarket) or stirring rod (available from chemical supplier).

Petri dish with a blue gel – each candidate requires one Petri dish with prepared blue gel made up as follows, the day before the practical:

Materials:

- gelatine powder – any brand available from the local supermarket
- bicarbonate of soda – any brand available from the local supermarket or lab supplier
- boiling water from a kettle
- bromothymol blue indicator solution – available from lab supplier
- plastic Petri dish with lid – available from lab supplier (standard size with diameter of 90 mm and depth of 15 mm)

Recipe for Blue gel (100 ml) – enough to pour into 5 Petri dishes

- Weigh 7 g of gelatine powder and place in a large cup or beaker.
- Weigh 0,5 g bicarbonate of soda and mix into gelatine powder.
- Slowly add 100 ml of boiling water. Stir.
- Add 5 ml of bromothymol blue indicator solution. Stir until all gelatine has dissolved.
- The liquid should be a deep blue colour.
- Pour about 15–20 ml into each Petri dish. Cover dishes with lids.
- Set in fridge overnight.

GENERAL INSTRUCTIONS

Candidates must supply their own pen, sharp HB pencil, metric ruler, eraser and calculator.

Several skills are to be assessed during this PAT. The observations to be marked by invigilator(s) must be discussed between the invigilator(s) and the Life Sciences teacher in the 45 minutes **before** the PAT commences. The venue(s) must be fully prepared by this time.

Attached are examples of suitable grids which can be photocopied and used on clipboards by the invigilator(s) during the PAT. Make sure that sufficient copies of the grid are made for each venue before the PAT commences.

The information contained in these grids **MUST** be transposed by the invigilator (**using red pen**) to the front cover of EACH candidate's completed PAT. This needs to be checked by the Chief Invigilator at the school, not only by the invigilator(s).

If a completed PAT does not have the marks written on the front cover of the PAT, the candidate will lose these assessment marks.

Invigilators are asked to please transfer this after the PAT onto the front of the script in red pen.

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| EXAMINATION NUMBER: | | |
| CRITERIA | | |
| Following instructions | 0 | 1 |
| Procedural skills | 0 | 1 |
| Manipulative skills | 0 | 1 |
| TOTAL | | (3) |

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|----------------------------|---|------------|
| EXAMINATION NUMBER: | | |
| CRITERIA | | |
| Following instructions | 0 | 1 |
| Procedural skills | 0 | 1 |
| Manipulative skills | 0 | 1 |
| TOTAL | | (3) |

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|----------------------------|---|------------|
| EXAMINATION NUMBER: | | |
| CRITERIA | | |
| Following instructions | 0 | 1 |
| Procedural skills | 0 | 1 |
| Manipulative skills | 0 | 1 |
| TOTAL | | (3) |

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|----------------------------|---|------------|
| EXAMINATION NUMBER: | | |
| CRITERIA | | |
| Following instructions | 0 | 1 |
| Procedural skills | 0 | 1 |
| Manipulative skills | 0 | 1 |
| TOTAL | | (3) |

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|----------------------------|---|------------|
| EXAMINATION NUMBER: | | |
| CRITERIA | | |
| Following instructions | 0 | 1 |
| Procedural skills | 0 | 1 |
| Manipulative skills | 0 | 1 |
| TOTAL | | (3) |

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|----------------------------|---|------------|
| EXAMINATION NUMBER: | | |
| CRITERIA | | |
| Following instructions | 0 | 1 |
| Procedural skills | 0 | 1 |
| Manipulative skills | 0 | 1 |
| TOTAL | | (3) |

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| EXAMINATION NUMBER: | | |
| CRITERIA | | |
| Following instructions | 0 | 1 |
| Procedural skills | 0 | 1 |
| Manipulative skills | 0 | 1 |
| TOTAL | | (3) |

An alternate method

Invigilators are asked to please transfer this after the PAT onto the front of the script in red pen.

| EXAMINATION NUMBER | Following instructions (1) | Procedural skills (1) | Manipulative skills (1) | Total (max 3) |
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