



N5 Chemistry: Whole-Course Revision

Lesson 3 - Practical Techniques and Problem Solving

Learning Outcomes

By the end of this lesson, you should:

1. Be able to describe and identify a range of practical techniques.
2. Have developed your problem solving skills.

Success Criteria

You will have been successful in this lesson if you:

1. Complete revision questions provided
2. Watch the links provided
3. Complete and submit homework assigned (16 and 17)

There is also a further reading section to help you gain more depth of understanding for this section.

If you have any questions about the content of this lesson, you should ask your class teacher either through your class MS team or via email. MS Teams will be monitored throughout the week by a chemistry teacher. If you need help or clarification with either the task or the content of the lesson, just ask.

Links to Prior Knowledge

You may wish to revise the following to help you understand this lesson:

Practical Techniques from Units 1, 2 and 3.

You do not need to copy any of the following notes into your jotter. You should complete questions as guided and watch videos with worked answers.

Watch this video first:

<https://youtu.be/hcf-hyQD4Qs>



Practical Techniques

You should be familiar with a number of different pieces of chemical apparatus and practical techniques from throughout your N5 Chemistry course.

When drawing diagrams make sure you use a ruler where necessary, label all pieces of equipment and check your diagram is 'workable' (this means it can successfully carry out the experiment being described).

Try drawing the experimental set-up for the following techniques (this is not a list of all the techniques – just some examples to try).

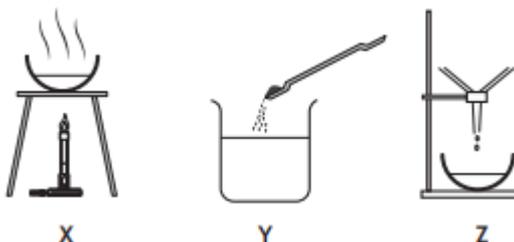
Do this from memory first, then check over with your practical techniques booklet (a copy can be found on the S4 Chemistry team).

- 1. Collecting and Measuring Gases**
- 2. Filtration**
- 3. Testing Electrical Conductivity**
- 4. Electrolysis**
- 5. Determination of E_h**

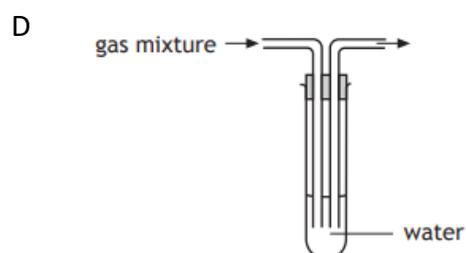
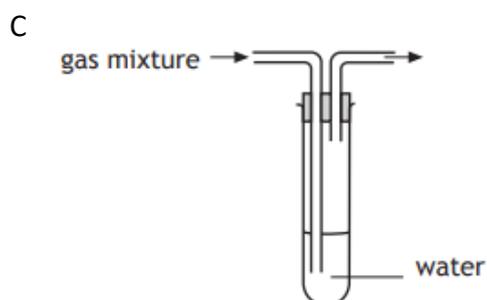
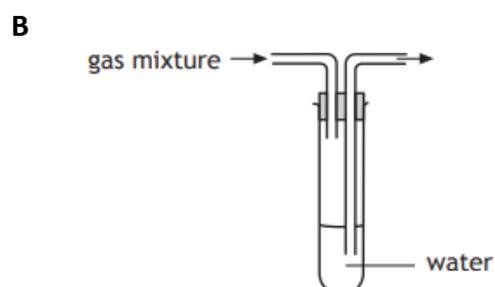
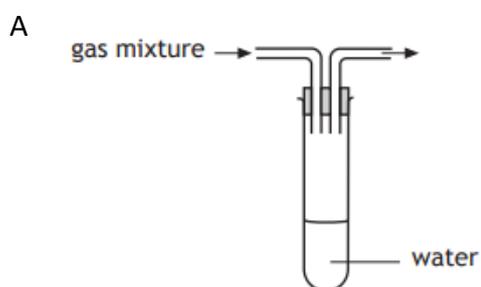


Question Examples

1. A student prepared a sample of copper sulfate crystals by reacting excess copper carbonate with acid. What is the correct order



2. 45cm³ of a solution could be most accurately measured out by using a
- A 50cm³ beaker
 - B 50cm³ burette
 - C 50cm³ pipette
 - D 50cm³ measuring cylinder
3. Which of the following diagrams shows the apparatus which would allow a soluble gas to be removed from a mixture of gases?



Answers to Practical Techniques Questions:

https://youtu.be/ura_qzYfMtk



Problem Solving

There are a number of different types of problem solving question that could be assessed in National 5 Chemistry.

Answer the following questions.

1.

Concentration of sodium chloride solution (mol l^{-1})	0	0.09	0.18	0.27	0.37	0.46
Freezing point ($^{\circ}\text{C}$)	0	-0.2	-0.5	-0.8	-1.1	-1.5

- Describe the relationship between the concentration and freezing point.
- Predict the freezing point of a 0.55 mol l^{-1} sodium chloride solution

(Questions continued on the next page)



2. Some indicators can have different colours when in solutions of different pH values. The tables give information about two indicators, bromothymol blue and methyl orange.

Bromothymol blue	
Colour	pH
Yellow	Below 6.0
Blue	Above 7.6

Methyl orange	
Colour	pH
Red	Below 3.1
Yellow	Above 4.4

The pH of three solutions was investigated using both indicators. The results are shown below.

Substance	Colour with bromothymol blue	Colour with methyl orange
A	Yellow	Red
B	Yellow	Yellow
C	Blue	Yellow

- a) Which solution is alkaline?
- b) Suggest a pH value for solution B

(Questions continued on the next page)



3. Petrol is a mixture of hydrocarbons. The tendency of a hydrocarbon to ignite spontaneously is measured by its octane number.

	Hydrocarbon	Octane number
1	3-methylpentane	74.5
2	Butane	93.6
3	Pentane	61.7
4	2-methylpentane	73.4
5	Hexane	24.8
6	Methylcyclopentane	91.3

A student made the hypothesis that as the chain length of a hydrocarbons increases, the octane number decreases.

Which set of three hydrocarbons should have their octane numbers compared in order to test this hypothesis?

- A 1, 4, 6
 - B 1, 2, 4
 - C 2, 3, 5
 - D 3, 4, 5
4. Chlorine gas produced can be used to make phosgene, COCl_2 . Phosgene is used in the manufacture of drugs and plastics.

Draw a possible structure for phosgene.

(Questions continued on the next page)



5. The table below gives some information about the melting and boiling points of some compounds.

Compound	Melting point (°C)	Boiling point (°C)
A	7	81
B	80	218
C	-160	-14
D	-79	138
E	41	182
F	-124	21

Identify the **two** compounds which are liquids at room temperature (25°C).

Answers to Problem Solving Questions here:

<https://youtu.be/5D40b9a9yil>

Further Reading and Extension Work

For Practical Techniques:

- Read over your N5 Chemistry Practical Techniques booklet.
- Use the Prelim Revision Toolkit to identify resources and questions on specific practical techniques

(continued on next page)



For Problem Solving:

- Attempt the following Past Paper questions:

Past Paper	Section 1 Questions	Section 2 Questions
2016	14	4a, 5, 8, 9b, 11a, 11b, 11dii
2017	4	2, 9c, 11b, 13c
2018	16	3a, 5a, 5d, 13b, 13c, 14a, 15, 16

Practical Techniques and Problem Solving are found throughout the National 5 Chemistry course.

You can access whole course revision on:

BBC Bitesize: <https://www.bbc.co.uk/bitesize/subjects/zmnp34j>

Scholar: Log in through GLOW

National 5 Chemistry

Evans2 chem web: <https://www.evans2chemweb.co.uk/>

Username: snhs password: giffnock

Select any teacher → revision