

Starter Activity: Chemistry out of the window

Introduction: This activity is intended as a warm-up 'ice-breaker' exercise, to stimulate thinking about how pupils might relate the chemistry they are taught to the world outside the window.

Key Stage: Chemistry KS3

National Curriculum Ref: Sc3 1a, 1e, 2h, 3g

Time: 10 minutes

Pupil learning outcomes: The chemical make-up of materials determines the basic building blocks of the environment we live in.

Context: To introduce the idea that 'chemistry is all around you'.

Common misconceptions: It is often not appreciated how the properties of materials affect both their natural and commercial uses.

Resource list: Participant card per group.

Activity: Participants simply look through a nearby window and attempt to answer the questions. This is best done in pairs or groups to encourage discussion.

Follow-up: Pupils can continue to look for examples of reaction in the local environment on their way home from school.



The view from the window (Starter Activity)

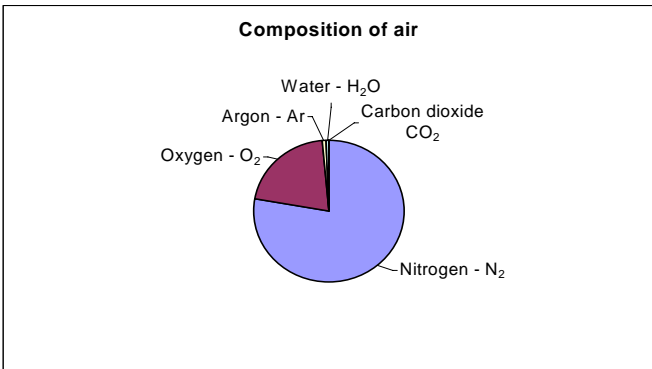
Some possible answers to this activity are given below.

Getting materials into the right state	Materials:		
	below melting point	between melting and boiling points	above boiling point
Write 'solids' 'liquids' or 'gases' into the correct boxes opposite	solids	liquids	gases

The state of materials outside the window		Materials outside the window:		
		below melting point	between melting and boiling points	above boiling point
Name one or more materials in this state outside window (the pie diagram below may help) and one has already been done for you		rubber (tyre) stone (chippings) brick (wall) plastic (gutter) wood (tree) glass (window)	water (oil?)	air
Tick the box opposite to indicate the best answer	Which group generally has the biggest particles (molecules)?	✓		
	Which group generally has the smallest particles (molecules)?			✓
	Which group generally has the simplest particles (molecules)?			✓
	Which group generally has the most complicated particles (molecules)?	✓		
	Which group is most mobile (flows fastest)?			✓
	Which group is least mobile (doesn't flow or hardly flows at all)?	✓		
	Which group generally contains the least reactive substances?	✓		

What general patterns have you seen in the materials through the window?

The solids generally have the biggest and most complex molecules and are least mobile. The gases are opposite and the liquids generally come in the middle. The solids seen through the window are least reactive.



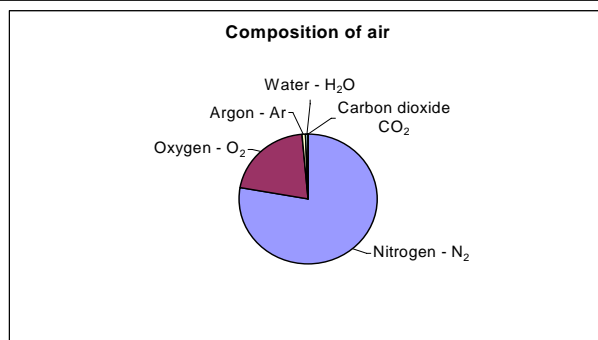
Reaction through the window	Example 1	Example 2	Example 3	Example 4	Example 5
What examples show that a chemical reaction has occurred to a solid material you can see? (some boxes have been filled in to help you)	<i>Dark staining on wall (iron minerals in the wall reacting with pollution)</i>	<i>Rusting iron/steel</i>	White staining on wall under cap stone or sill (deposition of calcium salts from mortar)	Green coating on copper	Crumbling mortar
How is the product of the reaction different from the original solid?	<i>Different colour</i>	Different colour	Different colour	Different colour	Smaller particles
Is the product more or less reactive than the original?	<i>Less</i>	Less	Less	Less	Less

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The state of materials outside the window		Materials outside the window:		
		below melting point	between melting and boiling points	above boiling point
Name one or more materials in this state outside window (the pie diagram below may help) and one has already been done for you		<i>rubber (tyre)</i> - add more		
Tick the box opposite to indicate the best answer	Which group generally has the biggest particles (molecules)?			
	Which group generally has the smallest particles (molecules)?			
	Which group generally has the simplest particles (molecules)?			
	Which group generally has the most complicated particles (molecules)?			
	Which group is most mobile (flows fastest)?			
	Which group is least mobile (doesn't flow or hardly flows at all)?			
	Which group generally contains the least reactive substances?			

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