# Escape the classroom

***Education in Chemistry***November 2018
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For this version of an Escape room, challenge students as a group to solve chemistry-based puzzles to open a locked box containing a reward, allowing them to develop problem-solving, knowledge and practical skills in a novel way.

On the following pages are teacher instructions, an example jigsaw and student worksheets.

## Jigsaw



## Periodic table guess who

#### Preparation

Label the guess who doors with: sulfur, sodium, germanium, oxygen, uranium, argon, francium, gold, carbon, copper, krypton, neon, silver, indium, chlorine, iodine, magnesium, hydrogen, nickel, europium, mercury, xenon, neptunium and aluminium

#### Clues

Close the door of …

… all elements named after planets.

… all elements named after countries.

… all elements that have full energy levels.

… all elements that are worn as jewellery.

… all elements that are used in coins.

… an element named after a continent.

… the element with an electron arrangement 2,8,3.

… the element required for combustion.

… the element which is a yellow solid at room temperature, found in matches.

… the element that burns with a bright white flame.

… the element used to kill germs in swimming pools.

## Microscale chemical changes

#### Materials

* Dropper bottles with various chemicals
* Universal indicator
* Hydrochloric acid (0.1 M)
* Sodium hydroxide (0.1 M)
* Lead nitrate (0.01 M)
* Potassium iodide (0.0 1M)
* Phenolphthalein solution
* Copper sulphate (0.5 M)
* Ammonia (1 M)
* Laminated instruction sheet

#### Activity

Pupils should add a drop of each the chemicals to each other using the instructions and note the colour. The colour will correspond to a number. This will give the code required to unlock the box. This can be used to introduce pH, precipitation and complexes.

#### Microscale chemical changes worksheet

1. Add 1 drop of lead nitrate to 1 drop of potassium iodide in the circle.
2. Add 1 drop of universal indicator to 1 drop of hydrochloric acid in the circle.
3. Add 1 drop of copper sulfate to 1 drop or ammonia in the circle.
4. Add 1 drop of phenolphthalein to 1 drop of sodium hydroxide in the circle.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |

## Conductivity code

#### Materials

* Carbon fibre
* Copper
* Electrolycra
* Perspex (cover slip)
* Rock
* Rubber band
* Sandpaper
* Wooden splint
* Zinc
* Microscale conductivity meter (see SSERC or CLEAPSS website for construction) or any set-up that can test for electrical conductivity.

#### Conductivity code worksheet

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Rubber** | **Wood** | **Electrolycra** | **Rock** | **Perspex** | **Copper** | **Zinc** | **Sand** | **Carbon fibre** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Which conducts electricity? Test to see. The conductors will reveal the key.