The pictures below show some changes that might happen in a jeweller's workshop.
Look at the drawings and click on the correct change, **physical** or **chemical**, for each one.



Molten silver turning into a solid.

physical or **chemical**



Propane gas burning to melt gold.

physical or **chemical**



Testing stones with acid to see if they are marble.

physical or **chemical**



Metal coin being heated and turning black. This is used as a test for the metal.

physical or **chemical**



A solid is dissolved to make a solution used to clean jewellery.

physical or **chemical**



The solid must be turned into a powder to be used in polishing gemstones.

physical or **chemical**

The box below contains descriptions of possible properties of a substance.

Click on the words and phrases that describe chemical properties.

strength	flammability	colour	flexibility	reaction with water
		conduction of heat	pH	

Complete these sentences about some groups of elements in the periodic table.

a Elements can be represented by international symbols like _____ for carbon, _____ for calcium, _____ for cobalt and _____ for copper.

Which of these properties of iron is a chemical property? Tick **one** box.

- ☐ **A** iron melts at a temperature of 1538 °C
- ☐ **B** iron has a density of 7.874 g/cm^3 at room temperature
- ☐ **C** iron rusts to form iron oxide when oxygen and water are present
- ☐ **D** iron conducts heat well

LIVEWORKSHEETS

Writing chemical formulae to express compounds depends on their valency.

Group in periodic table	1	2	3	4	5	6	7
Valency	1	2	3	4	3	2	1
Examples	H Li Na	Be Mg Ca	B Al	C Si	N P	O S	F Cl

The easiest way of working out a formula is to use the *cross-over method*.

This involves the following steps:

1. Write the symbols of the elements.
2. Write the valencies of the elements below the symbols.
3. Cancel down or simplify the valencies if possible.
4. *Cross-over* the numbers and tidy up to give the formula.

Some examples are shown opposite.

Try the following examples:

Example 1 aluminium oxide

1. *symbols* Al O
2. *valency* 3 2
4. *cross-over*

Formula Al_2O_3

Example 2 silicon dioxide

1. *symbols* Si O
2. *valency* ~~4~~ 2 ~~2~~ 1
3. *cancel*
4. *cross-over*

Formula SiO_2

1 calcium sulfide	CaS	Ca_2S	CaS_2	
2 lithium nitride	LiN	Li_3N	LiN_3	
3 magnesium fluoride	MgF	Mg_2F	MgF_2	
4 carbon chloride	CCl	C_4Cl	CCl_4	
5 phosphorus hydride	PH	P_3H	PH_3	
6 lithium phosphide	LiP	Li_3P	LiP_3	
7 sodium sulfide	NaS	Na_2S	NaS_2	
8 calcium oxide	CaO	Ca_2O	CaO_2	
9 carbon oxide	CO	C_2O	CO_2	
10 boron phosphide	BP	B_3P	BP_3	
11 aluminium nitride	AlN	Al_3N	AlN_3	
12 silicon carbide	SiC	Si_4C	SiC_4	

LIVEWORKSHEETS