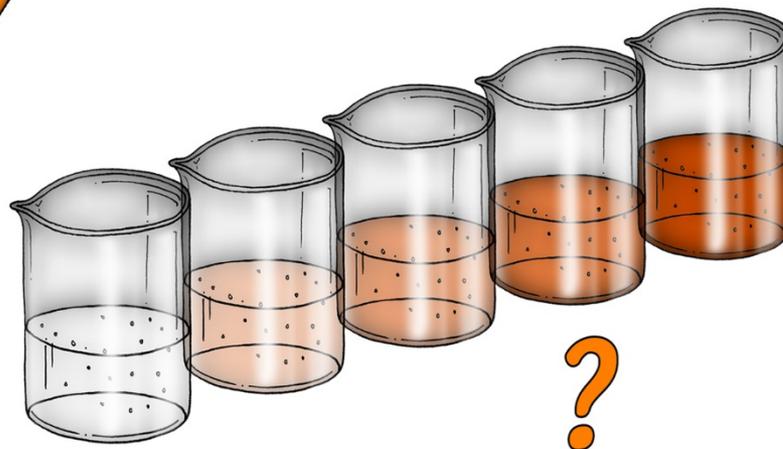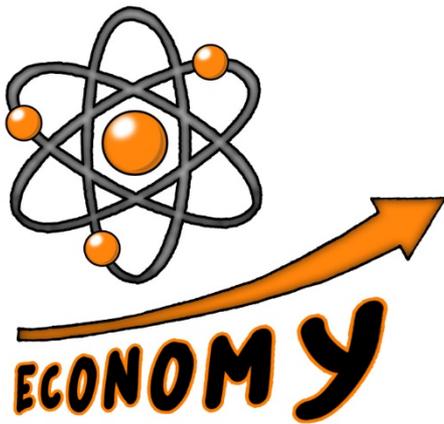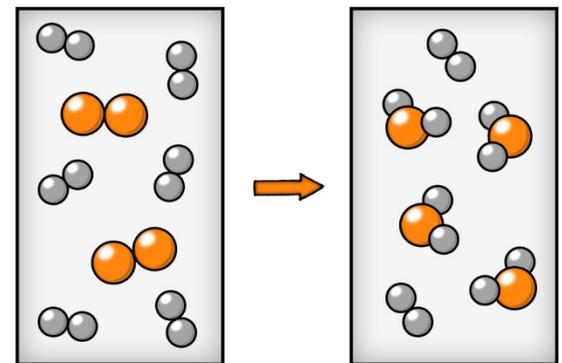MAGNESIUM + OXYGEN

MAGNESIUM OXIDE

AQA GCSE
QUANTITATIVE
CHEMISTRY
THINK IT!

ECONOMY

6.02 X 10²³

Chemical Equations:
- When sodium and water react the mass decreases. Explain why this is not a contradiction of the law of conservation and give another example where this is obeyed.
- Chlorine has a RAM of 35.5 because it is an isotope. Boron has isotopes of 10 and 11. Use this to explain why the RAM of Boron is given as 10.8.
- Explain how to calculate the relative formula mass of $Al_2(SO_4)_3$.

Chemical Change:
- Explain why there is a degree of uncertainty when calculating the mass of reactants or products.
- **(HT only)** Explain how to calculate the maximum mass of calcium oxide that 1500 tonnes of calcium carbonate can produce and explain why this is never achieved.

Mole:
(HT only)
- Describe what is meant by the term "mole".
- Explain how to calculate how many moles there are in 9.6g of sulfur.
- Describe how to calculate what mass of hydrogen peroxide (H_2O_2) is needed to produce 1.6g of oxygen.

Moles of Solutions and Gases:
(Chemistry and HT only)
- Explain how the concentration of a solution in mol/dm^3 is related to the mass of the solute and the volume of the solution.
- The formula of butane is C_4H_{10}. Calculate the volume of 11.6 g of butane gas at RTP.
- Explain why it can sometimes be difficult to calculate the volume of a gas.

AQA GCSE
Quantitative Chemistry

Think**IT**!

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Mole:
(HT only)
- 3.2g of iron oxide reacts with 16.2g of aluminium to produce aluminium oxide. Describe how to calculate the maximum mass of iron that could be collected at the end of the experiment, and why this mass is not collected.
- 16.2g of aluminium reacts with 32.0g of iron(III) oxide to produce iron metal and aluminium oxide. Explain why iron oxide is the limiting factor.

Atom Economy:
(Chemistry only)
- Calculate the atom economy in the production of iron in the blast furnace.
- **(HT only)** Ethanol can be produced by fermentation or by hydration of ethene. Compare their atom economy and evaluate which method is best for making ethanol.

Percentage Yield:
(Chemistry only)
- A company processes 200 tonnes of limestone a day. It collects 98 tonnes of calcium oxide for manufacturing. Calculate the percentage yield and explain why this reaction does not have a 100% yield production.
- **(HT only)** What mass of carbon dioxide is formed when 12 g of carbon is burned in air?

Concentration of Solutions:
- 0.5 mol of solute is dissolved in 250 cm^3 of solution. Calculate its concentration.
- Calculate the concentration for 2.925×10^{-4}g of sodium chloride in 5cm^3 of water.
- **(HT only)** Fire crews will often attend accidents involving chemical containers to hose down chemical spills. Explain why.