

# Reactivity

## Lesson 6 - Acids and Metal Oxides

Chemistry - Key Stage 3

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What state are metal oxides?

**Solid**



Metal oxides are bases. What is a base?

**Bases can dissolve in water to produce an alkali with pH 8-14.**



What element reacts with metal to form metal oxide?

**Oxygen**



# Independent Practice

## What is a metal oxide?

Success criteria

- Colour
- State
- pH
- How do they form?
- Example



# Independent Practice

## What is a metal oxide?

- Metal oxides are different colours
- Metal oxides are solids
- They are basic meaning they dissolve in water to form alkali (pH 8-14)
- They form when a metal reacts with oxygen
- E.g. copper + oxygen → copper oxide



Zinc oxide + hydrochloric acid → zinc chloride + water



Sodium oxide + sulfuric acid → sodium sulfate + water



Silver oxide + nitric acid  $\rightarrow$  silver nitrate + water



# Independent Practice

1. Magnesium oxide + sulfuric acid → \_\_\_\_\_ + water
2. Iron oxide + \_\_\_\_\_ → iron nitrate + water
3. \_\_\_\_\_ + hydrochloric acid → sodium chloride + water
4. Calcium oxide + nitric acid → \_\_\_\_\_ + \_\_\_\_\_
5. \_\_\_\_\_ + \_\_\_\_\_ → lithium chloride + water



# Independent Practice

1. Magnesium oxide + sulfuric acid → **magnesium sulfate** + water
2. Iron oxide + **nitric acid** → iron nitrate + water
3. **Sodium oxide** + hydrochloric acid → sodium chloride + water
4. Calcium oxide + nitric acid → **calcium nitrate** + **water**
5. **Lithium oxide** + **hydrochloric acid** → lithium chloride + water



**Metal + acid → salt + hydrogen**

**Metal oxide + acid → salt + water**

Give 2 similarities between these two general equations.



**Metal + acid → salt + hydrogen**

**Metal oxide + acid → salt + water**

Give 2 differences between these two general equations.



# Independent Practice

1. Sodium + hydrochloric acid →
2. Sodium oxide + hydrochloric acid →
3. Highlight the similarities between these two equations in one colour.
4. Highlight the differences between these two equations in another colour.



# Independent Practice

1. **Sodium** + **nitric acid** → **sodium nitrate** + **hydrogen**
2. **Sodium oxide** + **nitric acid** → **sodium nitrate** + **water**
3. Similarities are highlighted in purple above.
4. Differences are highlighted in blue above.



# Further Independent Practice

1. Lithium oxide + sulfuric acid →
2. Iron + nitric acid →
3. Beryllium + hydrochloric acid →
4. Silver oxide + nitric acid →
5. Potassium oxide + hydrochloric acid →
6. Zinc + sulfuric acid →



# Further Independent Practice

1. Lithium oxide + sulfuric acid → lithium sulfate + water
2. Iron + nitric acid → iron nitrate + hydrogen
3. Beryllium + hydrochloric acid → beryllium chloride + hydrogen
4. Silver oxide + nitric acid → silver nitrate + water
5. Potassium oxide + hydrochloric acid → potassium chloride + water
6. Zinc + sulfuric acid → zinc sulfate + hydrogen

