Physical Setting/Chemistry

Two practice sessions per week, followed by one new retrieval check.

Name _____ **Date** _____

Week 1 / Use a small reference table + Use electron accounting

Work the two exercises on the corresponding week's sheet. Then put your notes away and answer this check.

Element Q has 15 protons and mass number 31. Give neutrons and electrons for Q^{3-}.

Week 2 / Track a redox change + Check a mole ratio

Work the two exercises on the corresponding week's sheet. Then put your notes away and answer this check.

If 40 g dissolves per 100 g water, how much dissolves at saturation in 75 g water?

Week 3 / Connect neutralization to quantity + Read data before applying a rule

Work the two exercises on the corresponding week's sheet. Then put your notes away and answer this check.

Why do concentrations stay constant at dynamic equilibrium even with unequal amounts of reactant and product?

Bridge rehearsal

A salt dissolves to 30 g per 100 g water at room temperature. A warm solution contains 43 g in 100 g water. Find what crystallizes on cooling to room temperature.

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SESSION 1

Use a small reference table

Practice reference values at 1 atm: ethanol melts at −114 °C and boils at 78 °C. Water melts at 0 °C and boils at 100 °C. Compare their phases at 85 °C. Which has the higher normal boiling point, and what does that indicate about attractions in the liquid?

At 1 atm	Melting (°C)	Boiling (°C)
Ethanol	−114	78
Water	0	100

Start here if you were away. Locate 85 relative to each boiling point.

SESSION 2

Use electron accounting

A neutral chlorine atom has atomic number 17 and mass number 35. It gains one electron. Give protons, neutrons, and electrons before and after. Explain the charge without changing the isotope.

Start here if you were away. Atomic number counts protons. Subtract it from mass number for neutrons.

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SESSION 3

Track a redox change

For $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$, write both half-reactions, identify oxidation and reduction and show how electrons cancel. Name the reducing agent and explain the name.

Start here if you were away. Track charge on zinc and copper separately.

SESSION 4

Check a mole ratio

For $2H_2 + O_2 \rightarrow 2H_2O$, start with 3.0 mol H_2 and 2.0 mol O_2. Determine the limiting reactant, moles of water formed and moles of excess reactant remaining. Justify from the balanced equation.

Start here if you were away. Circle the 2:1 reactant ratio and compare with what is available.

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SESSION 5

Connect neutralization to quantity

An acid supplies one H^+ per molecule and a base supplies one OH^- per formula unit. A 25.0 mL acid sample of concentration 0.100 mol/L is exactly neutralized by 20.0 mL base. Find base molarity and write the net ionic equation.

Start here if you were away. Convert mL to L and find acid moles first.

SESSION 6

Read data before applying a rule

An original soluble-salt table gives maximum grams dissolved per 100 g water: 32 g at 20 °C and 50 g at 60 °C. A solution has 90 g salt dissolved in 200 g water at 60 °C. It cools to 20 °C and reaches equilibrium without evaporation. How much crystallizes? Explain and classify the original solution.

Start here if you were away. Rescale both maximum amounts to 200 g water.