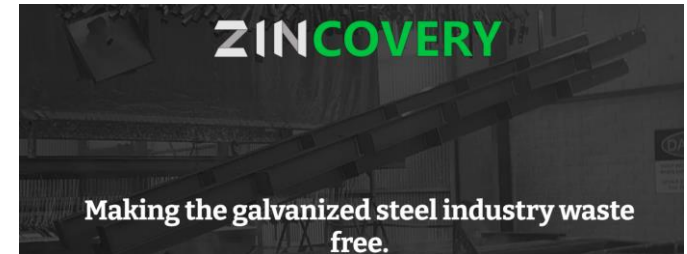


NZ Companies

1. Mint Innovation
2. Zinccovery
3. Hot Lime Labs
4. Resene
5. Liquium



Format

1. Short presentations about each of the 5 companies
2. Break into small groups – each group will focus on one company and see how the chemistry can be linked to the NCEA curriculum
3. Collate information and produce a 2-page information pamphlet (ongoing task)

Zincovery

- Zinc is essential for the modern world such as renewable energy, vehicles and infrastructure
- Fifth most used industrial metals
- Recycling zinc is critical for preserving this resource for future generations
- Recycled zinc has a larger CO₂ footprint than if it was mined
- **Zincovery is building an alternative to the current carbon intensive zinc recycling process**

Zincovery



Zincovery

- Aqueous and Redox Chemistry explored
- Zinc is dissolved in acid
- Impurities are removed using oxidation chemistry and adjusting the pH of the solution
- An electrochemical cell is used to electroplate the solid zinc from the acid – reduction process



mint

Teacher's day

2021 APAC 25 COMPANY

BUSINESS CONFIDENTIAL

Technology
Pioneers
2022 cohort



Our Purpose



Low-carbon, circular technologies for recovering **critical metals**, to electrify and decarbonise at global scale

A massive global challenge: The supply of metals is unsustainable....



Global demand for both precious and industrial metals continues to rise



75% of precious metal supply is from mining virgin ores



Mining is increasingly inefficient and pollutes the earth



Environmental impact of metal increasingly unacceptable to governments, consumers, and critically, downstream supply chain



...this is driving demand for low-carbon alternatives

Mint's low-carbon process enables low cost biorecovery of critical metals from the urban mine



Critical Metals	Gold, copper, tin, palladium, platinum, rhodium, silver
Used in high growth climate critical sectors	<ul style="list-style-type: none"> ▪ Digital technologies: circuit boards and chips ▪ Electrification: electrical circuitry essential to decarbonise ▪ Catalysts: low carbon transformation catalysts

Mint Innovation



Mint's core chemistry uses principles taught in the NCEA curriculum



Aqueous chemistry

- Mint's process in part utilises acids and oxidants to dissolve metals, including; Cu, Fe, Zn, Ni, and Au.
- We neutralise these solutions by adding base to increase the pH to precipitate metal hydroxides as part of our wastewater treatment process.
- We use titration to determine acid-base concentrations.
- These processes are based around principles including; solubility, pH and equilibrium positions.

Redox chemistry

- The reactivity series is applied to create selective leaching process i.e elements like Fe, Zn, and Ni are leached first, followed by the Cu. Then finally the Au.
- Oxidants such as H_2O_2 are used to dissolve metals like Cu.
- The copper is recovered from solution by electrolysis using an electrochemical cell.

Mint Innovation: The team....



Mint team profile

- Values driven multinational team of 40
- Technical, engineering and commercial ~20% PhD's
- Primarily a mixture of chemists, biotechnologists, and chemical / process engineers