

# Chemical Systems

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# MINING OF THE LITHOSPHERE

## GOLD

Gold:

- Is a precious metal
- Is very unreactive
- Has characteristics of metals
- Occurs mostly in gold ore
- This ore is not renewable
- Mostly mined in Witwatersrand but also in the Free State, North West and Mpumalanga.

## INFLUENCE ON THE ENVIRONMENT

POSITIVE	NEGATIVE
<ul style="list-style-type: none"><li>• Job creation</li><li>• Helps to develop infrastructure</li><li>• Assures foreign capital revenue</li></ul>	<ul style="list-style-type: none"><li>• Biodiversity gets lost</li><li>• This mining has different forms of pollution as a consequence</li><li>• Needs large amounts of water</li><li>• Destroys the landscape of the environment</li></ul>

## Most important processes of the mining and purification of gold

1. Gold is mined underground and are taken to places for processing with cocopans and conveyors.
2. The gold ore is then broken and finely grounded.
3. **Cyanidation process** gold is solved with a diluted cyanide solution.
4. Then they remove the gold from the solution and the unwanted rock is then transported to slimes dams.
5. Thereafter, Zinc precipitation and filtration takes place. The oxygen is removed from the gold solution and Zinc powder is added. The precipitate that contains gold and zinc is now divided by filtration. The gold stays behind because the sulphuric acid added only reacts with the zinc.

6. The gold obtained from the solution is then melted to deliver gold bars.

## IRON

### Where is iron mined?

It is mined in open cast mines in Thabazimbi ( Limpopo) and Kathu (Northern Cape)

### INFLUENCE

POSITIVE	NEGATIVE
<ul style="list-style-type: none"><li>• Contributes to conservation projects such as wood projects</li><li>• Job creation</li><li>• Can be easily distorted</li><li>• Easy to purify</li></ul>	<ul style="list-style-type: none"><li>• Causes noise pollution</li><li>• Utilizes large amounts of water to mine iron</li><li>• Large amounts of CO<sub>2</sub> are released</li></ul>

### Processing of iron

1. Mined in open cast mines. They remove above ground and shoot the ore loose. The iron ore is then transported to the place where processing takes place, by trucks and conveyors.
2. The particles are then broken by breakers to form small particles.