Copper is a good conductor of heat and electricity. Copper is also flexible so can be pulled out into wires, which are used to transport electricity.

Iron is the most abundant element in the crust by weight and accounts for over 50% of all metal production worldwide. It is commonly combined (alloyed) with other metals to produce steel.

Silicon is the second most abundant element after oxygen and makes up the sand you find at the beach. It is a very good semiconductor and is used in computer processors.

Aluminium has a very low density for a metal, making it useful in reducing the weight of metal products. It is also completely non-toxic, so commonly used in food and drinks cans.

Titanium is strong but has a low density. It also doesn’t corrode in seawater and repels UV light. Titanium is commonly combined (alloyed) with other metals in many items including phones and computers.
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**MINERAL**

**Sphalerite**

**CONTAINS:** **Indium**

Indium has a low melting temperature. It is very soft and ductile. Indium is often used as a superconductor - a material with no electrical resistivity - and to absorb excess heat in electronics.

**Mineral**

**Graphite**

**CONTAINS:** **Carbon**

Graphite is a form of pure carbon, along with coal and diamonds. It is produced by the metamorphism of organic material in sedimentary rocks but can also be found in igneous rocks and meteorites.

**Mineral**

**Spodumene**

**CONTAINS:** **Lithium**

Lithium is soft enough to be cut with a knife and has a very low melting temperature. It is the least dense element that is solid at room temperature.

**Mineral**

**Catterite**

**CONTAINS:** **Cobalt**

Named after the German word for goblin (Kobold), cobalt is a hard, brittle metal. It is also magnetic and has the highest melting temperature of all magnetic metals.

**Mineral**

**Borax**

**CONTAINS:** **Boron**

Discovered in 1808, boron is very important in plants as it is used in plant cell walls. Pure boron is a dark brown powder which burns bright green.

**Mineral**

**Graphtite**

**CONTAINS:** **Carbon**

Graphite is a form of pure carbon, along with coal and diamonds. It is produced by the metamorphism of organic material in sedimentary rocks but can also be found in igneous rocks and meteorites.

**Mineral**

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**MINERAL**

**CHALCOPYRITE**

**CONTAINS:** COPPER

Copper is a good conductor of heat and electricity. Copper is also flexible so can be pulled out into wires, which are used to transport electricity.

**MINERAL**

**BERYL**

**CONTAINS:** BERYLLIUM

Beryllium is uncommon in the universe because it undergoes fusion in stars. Beryllium has a low density and conducts electricity. Gem forms include emerald and aquamarine.

**MINERAL**

**PLATINUM**

**CONTAINS:** PLATINUM

Commonly used in jewellery, platinum is as resistant to corrosion as gold. Platinum is used more commonly to lessen the effects of the harmful gases produced by car exhausts.

**MINERAL**

**PYROCHLORIE**

**CONTAINS:** NIOBIUM

In nature, niobium occurs with the element tantalum and is hard to separate. The first time niobium was discovered, it was in a mineral called columbite, named after Christopher Columbus.

**MINERAL**

**MONAZITE**

**CONTAINS:** NEODYMIUM

Neodymium is used to make strong permanent magnets. Neodymium is very rare; it is part of the lanthanide series of chemical elements, most of which can also be found in the mineral monazite.
**MINERAL**

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Rare and expensive, gold is a dense, soft metal, commonly used in jewellery. Many discoveries in chemistry have been made by people trying to convert metals to gold, in a study called alchemy.

Named after the German word for goblin, 'kobold', cobalt is a hard, brittle metal. It is also magnetic and has the highest melting temperature of all magnetic metals.
MINERAL

SPODUMENE

CONTAINS: LITHIUM

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MINERAL

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ACTION

RECYCLE!

Common metals like aluminium and steel are very easy to recycle and doing so saves lots of energy!

Play this card at the start of your turn instead of drawing from the minerals deck. Search through the discarded cards, choose a mineral and add it to your hand.

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ACTION

RECYCLE!

Some metals can only be found in certain countries. Trade is needed so that we can all build products!

Play this card at the start of your turn instead of drawing from the minerals deck. Give a card from your hand to another player. That player must also give you one of their cards! Then draw a mineral card.

TRADE!

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TRADE!
High Quality Ore!

- Some minerals have a higher quality metal than others – this means they are worth more money!
- Play this card at the start of your turn instead of drawing from the minerals deck.
- Draw three minerals cards, then discard two.

Economics!

- The products that people want change over time causing some minerals to become more valuable and others less.
- Play this card at the start of your turn instead of drawing from the minerals deck.
- Draw three minerals cards, then discard two.
- Every player must discard a product of their choice and draw a new one from the product deck.
- Then draw a card.
PRODUCT

JET ENGINE
REQUIRES:
- MAGNETITE (IRON)
- RUTILE (TITANIUM)
- PYROCHLORITE (NIOBIDIUM)

PRODUCT

CAMERA
REQUIRES:
- BAUXITE (ALUMINIUM)
- GOLD
- PYROCHLORITE (NIOBIDIUM)

PRODUCT

ELECTRIC CAR
REQUIRES:
- CHALCOPYRITE (COPPER)
- CATTIERIT (COBALT)

PRODUCT

FIREWORKS
REQUIRES:
- RUTILE (TITANIUM)
- BORAX (BORON)

PRODUCT

TV
REQUIRES:
- QUARTZ (SILICON)
- CHALCOPYRITE (COPPER)
- SPHALERITE (INDIUM)

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- MAGNETITE (IRON)

REQUIRES:
- GRAPHITE (CARBON)
- PLATINUM

REQUIRES:
- COPPER
- BORAX (BORON)

SPHALERITE (INDIUM)

PRODUCT

PHONE
REQUIRES:
- MONAZITE (NEODYMIUM)
- GRAPHITE (CARBON)
- QUARTZ (SILICON)

REQUIRES:
- PLATINUM

CHALCOPYRITE ( COPPER)

SPHALERITE (INDIUM)

PRODUCT

COMPUTER
REQUIRES:
- GRAPHITE (CARBON)

PRODUCT

SOLAR PANEL
REQUIRES:
- BORAX (BORON)

SPHALERITE (INDIUM)

PRODUCT

BATTERY
REQUIRES:
- SPODUMEME (LITHIUM)

MAGNETITE (IRON)

CATTIERITE (COBALT)

PRODUCT

CAR
REQUIRES:
- RUTILE (TITANIUM)
- MAGNETITE (IRON)

REQUIRES:
- GRAPHITE (CARBON)
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REQUIRES:
- COPPER
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REQUIRES:
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MAGNETITE (IRON)

CATTIERITE (COBALT)
PRODUCT

SPACE SHUTTLE

REQUIRES:
BAUXITE (ALUMINIUM)

GRAPHITE (CARBON)

SPODUMENE (LITHIUM)

PRODUCT

TRAIN

REQUIRES:
CHALCOPYRITE (COPPER)

BERYLLIUM (BERYL)

MAGNETITE (IRON)

PRODUCT

PROSTHETIC

REQUIRES:
BAUXITE (ALUMINIUM)

CATTIERITE (COBALT)

PRODUCT

WIND TURBINE

REQUIRES:
CHALCOPYRITE (COPPER)

BERYLLIUM (BERYL)

PRODUCT

SATELLITE

REQUIRES:
QUARTZ (SILICON)

BAUXITE (ALUMINIUM)

BERYLLIUM (BERYL)

RUTILE (TITANIUM)

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