

# Fractionating Game

This game is designed to practice answering Products from Rocks questions. They are based on the AQA C1a Module but other syllabuses may group these topics differently.

This game can be played with 2, 3 or 4 players. The following pages contain the game board, and 4 question sheets with 4 separate sets of true and false questions. Rules for playing the game are included on the playing board.

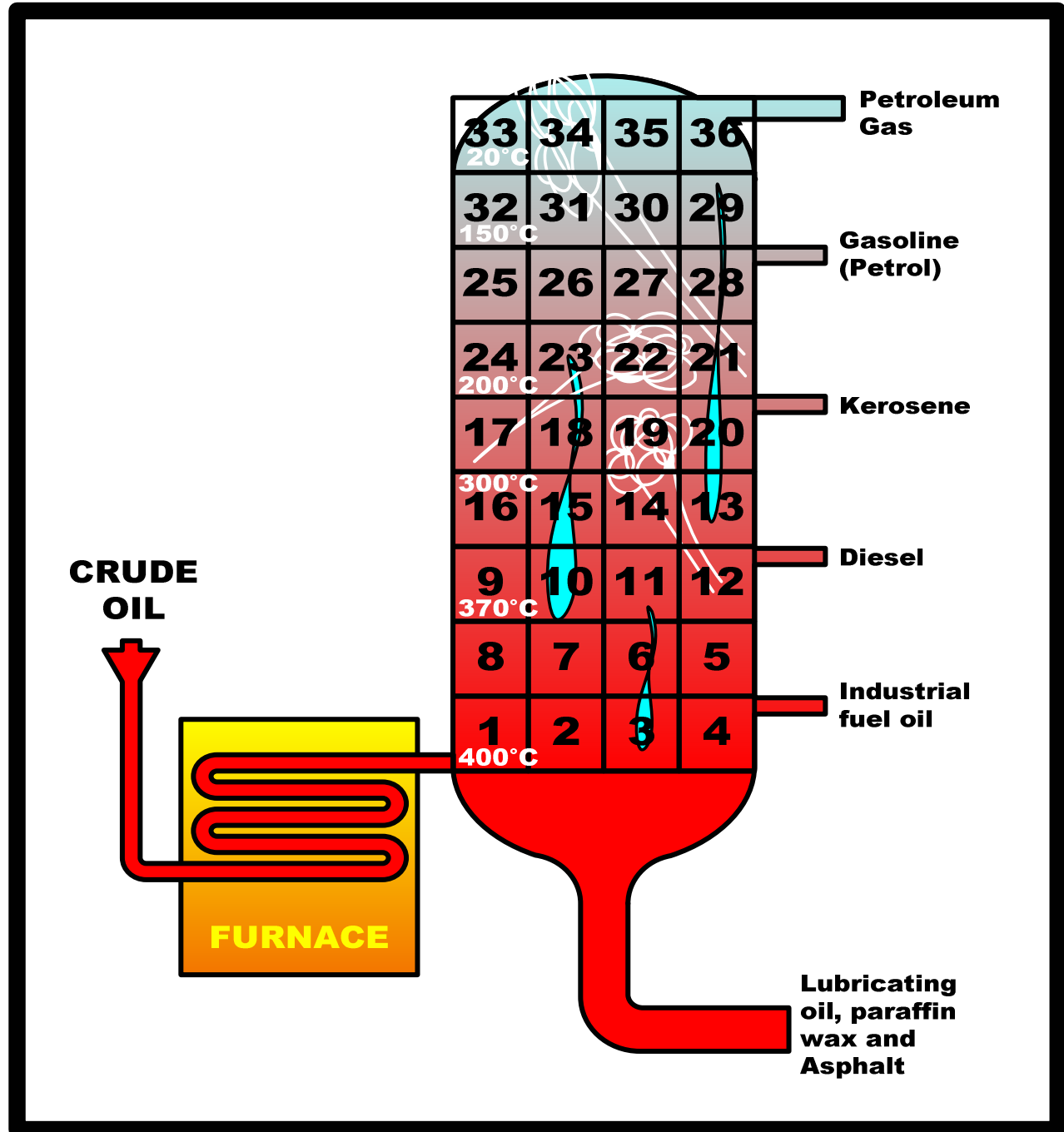
There are 3 games in this series available from GamePlan Games. All the games use the same 'True or False' questions, but each game offers a different playing objective. You can renew your motivation for learning the same facts by playing a different game. If you would like some new questions, why not buy the "Round the Block" game from our website?

Here is a summary of Products from Rocks games, which are available for FREE download from [www.GamePlanGames.co.uk](http://www.GamePlanGames.co.uk)

Game	No. of players	No. of sheets	Playing objective
Fractionating	2,3 or 4	1	To be first to get from the bottom to the top of the fractionating column.
Metals Risk	2,3 or 4	1	Make yours the dominating metal in the market.
Limestone Battle	2,3 or 4	1 each	To guess positions of your opponent's 3 Limestone molecules.

You can also download and print off the Revision Sheet which is designed to help you to understand why an answer you thought was right is actually wrong.

# Fractionating Game



## Scoring

Players take it in turns to ask their opponent True or False questions from the question sheets. Each player needs a counter which is initially placed at the top of the furnace (next to 1).

A player answering correctly moves forwards one square, but stays on the same square for an incorrect answer, except when:-

a) the player is on an **upwards** travelling jet of vapour. A correct answer sends the player up the jet to the cloud, but if the answer was incorrect the player just moves forward one square.

b) the player is on a **downward** dribble, an incorrect answer sends the player down the dribble as far as the puddle at the bottom, but a correct answer moves the player forward one square.

**Note** that the 'forward' direction reverses on each row, so check the direction after doing up a jet or down a dribble.

The object of the game is to move up through the fractionating column in a race to get to the top. The winner is the person who gets to petroleum gas first.

## Products from Rocks A – True or false?

1.  $MgCO_3$  is the formula for a compound.
2. Potassium is a transition metal
3. The formula for quicklime is  $CaO$ .
4. If you heat Calcium Carbonate it gives off Carbon Dioxide
5. Crude oil can be separated into fractions because heat breaks it down
6. Calcium Carbonate, Carbon Dioxide and water are all compounds
7. Iron Oxide is turned into pig-Iron by heating with coke
8. Burning fossil fuels in a limited supply of air produces Carbon dioxide which causes human poisoning
9. The method used to extract a metal from its ore depends on its density
10. Aluminium and Titanium are more expensive than iron because they need a lot of energy to extract them
11. Aluminium is used in aircraft because it is very strong
12. The chemical name for slaked lime is Calcium Hydroxide
13. Gold is used to make jewellery
14. The larger the alkane molecule the lower the boiling point
15. Chromium is mixed with iron to make high alloy steels
16. Kerosene has a lower boiling point than petrol
17. The main metal in Limestone is Calcium
18. Magnesium is in the same group as Sodium
19. In dot cross diagrams the dot is the nucleus
20. In a compound, atoms are held together by bond
21. Copper is used to make steel
22. When copper carbonate is heated, the gas given off is Carbon Dioxide.
23. One argument for allowing limestone quarrying in National Parks is that it provides jobs for local people
24. One argument against allowing limestone quarrying in National Parks is that we don't use limestone for building anymore.
25. Transporting limestone by lorries causes pollution and damage to buildings. This could be reduced by transporting it by rail.
26. The black powder left from heating Copper Carbonate is Copper Oxide
27. Rocks from which metals can be extracted economically are called alloys
28. Burning a pure alkane never produces sulphur dioxide
29. A blast furnace operates continuously for several years because it is expensive to heat it up
30. Pig-Iron is not used for making cars because it is too brittle

### Answers

True	False
1, 3, 4, 6, 7, 10, 12, 13, 15, 17, 19, 20, 22, 23, 25, 26, 28, 29, 30	2, 5, 8, 9, 11, 14, 16, 18, 21, 24, 27

### Products from Rocks B- True or false?

1. **Cl<sub>2</sub>** is the formula for a compound.
2. Limestone is used to make quicklime
3. Wetting Calcium Carbonate produces Calcium Hydroxide
4. **Carbon, Iron and Oxygen** are all metals
5. **The formula for carbon dioxide is CO**
6. A mixture of sand, stones cement and water makes concrete
7. **Heating limestone, sand and sodium carbonate** makes mortar
8. **Pig-Iron** is changed into pure Iron by adding carbon
9. Burning fossil fuels can produces particles in the air which causes global dimming
10. Crude oil can be separated into fractions because it is a mixture of compounds
11. The diesel fraction has molecules that are longer than petrol molecules
12. Aluminium is very reactive but stops corroding when the oxide layer stops oxygen reaching the rest of the metal
13. **The chemical name for slaked lime is Calcium Oxide**
14. **C<sub>3</sub>H<sub>8</sub>** is collected near the top of the fractionating column
15. Petrol is a thinner liquid than diesel
16. Copper is used for making water pipes.
17. **Metals with high melting points are liquid at room temperature.**
18. **Brittle metals do not shatter when hit with a hammer**
19. Coal is likely to produce acid rain when burned
20. **When copper carbonate is heated, the gas given off is Copper Oxide.**
21. One argument for allowing limestone quarrying in National Parks is that it provides jobs for local people
22. One argument against allowing limestone quarrying in National Parks is that quarries make unsightly scars on the landscape.
23. Dropping hard steel balls onto concrete is a test for its hardness
24. **Gold is often found as ingots in rock because it is a reactive metal**
25. **The formula for the alkane with 2 Carbon atoms is C<sub>2</sub>H<sub>4</sub>**
26. There is at least 250 years supply of Aluminium ore left at our present rate of usage
27. **Pure Iron is soft and easily shaped because the atoms can rotate**
28. Magnesium oxide is heavier than magnesium before it is burned because it is a compound
29. **Sulfur dioxide is an alkane.**
30. Aluminium is better than iron for making cans for fizzy drinks because rust is toxic

#### Answers

True	False
2, 6, 9, 10, 11, 12, 14, 15, 16, 19, 21, 22, 23, 26, 28, 30	1, 3, 4, 5, 7, 8, 13, 17, 18, 20, 24, 25, 27, 29

### Products from Rocks C- True or false?

1. CO<sub>2</sub> is the formula for a compound.
2. The atoms in ammonia are held together by chemical symbols
3. O<sub>2</sub> is the formula for a compound.
4. The formula for Calcium Carbonate is CaCO<sub>2</sub>.
5. Each atom has a nucleus surrounded by electrons
6. Copper carbonate is an element
7. Burning fossil fuels in plenty of air produces Carbon monoxide which causes acid rain.
8. Titanium is used in aircraft because it has a low density and is also strong.
9. It is important to recycle Aluminium because it needs electrolysis to extract it.
10. Slaked lime can be used to make quicklime
11. Aluminium is an unreactive metal found native in the earth
12. Quicklime is made by thermal decomposition in a kiln
13. Heating Calcium Carbonate produces Calcium Hydroxide
14. Titanium is mixed with other metals to make it harder
15. Titanium is often used because it has a high density
16. Iron is a transition metal
17. A mixture of Slaked lime, sand and water makes glass
18. Ethanol is a clean fuel producing only Carbon Dioxide and water
19. In dot cross diagrams the crosses are electrons
20. The black powder left from heating Copper Carbonate is Carbon
21. One argument for allowing limestone quarrying in National Parks is that it created more space for wildlife
22. Limestone is important in the manufacture of cement
23. Rocks from which metals can be extracted economically are called ores
24. Pure iron is changed into Low-alloy steels by removing impurities
25. Aluminium is extracted from Aluminium Oxide by electrolysis. It is expensive because it takes a lot of electricity.
26. Alkanes with small molecules have high boiling points
27. The formula for the alkane with 2 Carbon atoms is C<sub>2</sub>H<sub>6</sub>
28. It takes less energy to make iron if scrap iron is used because it does not need to reduce the iron oxide in the scrap.
29. A blast furnace operates continuously for several years because that way it produces less waste slag.
30. Zinc is more reactive than Iron and can be extracted from its ore by using carbon.

#### Answers

True	False
1, 5, 8, 9, 12, 14, 16, 18, 19, 22, 23, 25, 27, 28, 30	2, 3, 4, 6, 7, 10, 11, 13, 15, 17, 20, 21, 24, 26, 29



### Products from Rocks D – True or false?

1. **Ca** is the formula for a compound
2. **The** atoms in a molecule are represented by bonds
3. The formula for water is  $H_2O$ .
4. **Fluorine** is a compound
5. A mixture of metals is known as an alloy
6. **Bronze, Calcium and Copper** are all elements
7. Heating limestone and clay makes cement
8. **Blowing Carbon Dioxide** through lime water creates Calcium Carbonate
9. **Slaked lime** is made by reacting quicklime with carbon dioxide
10. **The** diesel fraction has molecules that are smaller than petrol molecules
11. Crude oil is heated before it goes into the fractionating column to make it into a vapour.
12.  $C_{16}H_{34}$  has a higher boiling point than  $C_{12}H_{26}$
13. Slaked lime can be used to make mortar
14.  $C_3H_8$  has a higher boiling point than  $C_8H_{18}$
15. Tough metals do not shatter when hit with a hammer
16.  $C_3H_8$  catches fire more easily than  $C_{12}H_{26}$
17. **Electrical cables** are made of silver
18. Oxygen is often combined with metals in ores
19. Good conductors let heat pass through easily
20. **In** dot cross diagrams the crosses are protons
21. **Transporting limestone** by lorries causes pollution and damage to buildings. This could be reduced by using larger lorries.
22. Lithium is an element
23. **Limestone** is important in the manufacture of Aluminium
24. The method used to extract a metal from its ore depends on its reactivity
25. **Limestone** is important in the manufacture of Copper
26. **Burning** a pure alkane never produces water vapour
27. Pure Iron is soft and easily shaped because the atoms can slide over each other
28. **The** formula for the alkane with 2 Carbon atoms is  $C_2H_2$
29. All alkanes are hydrocarbons
30. **Substances** in the same horizontal row of the periodic table have similar chemical properties

### Answers

True	False
3, 5, 7, 8, 11, 12, 13, 15, 16, 18, 19, 22, 24, 27, 29	1, 2, 4, 6, 9, 10, 14, 17, 20, 21, 23, 25, 26, 28, 30

