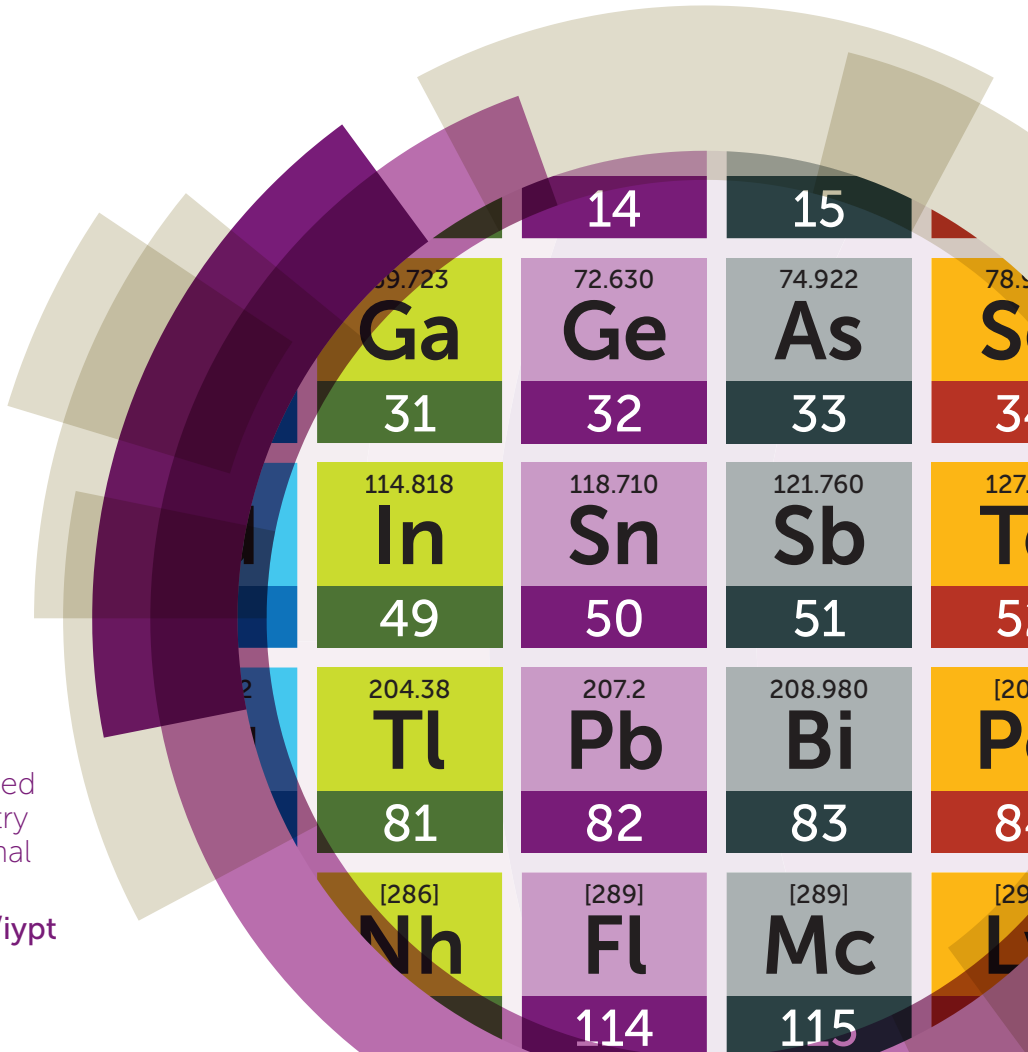
ROYAL SOCIETY OF CHEMISTRY | Celebrating IYPT 2019

Guess the element



These activities have been created by the Royal Society of Chemistry to help celebrate the International Year of the Periodic Table.

Find out more at: **www.rsc.org/iypt**


THE
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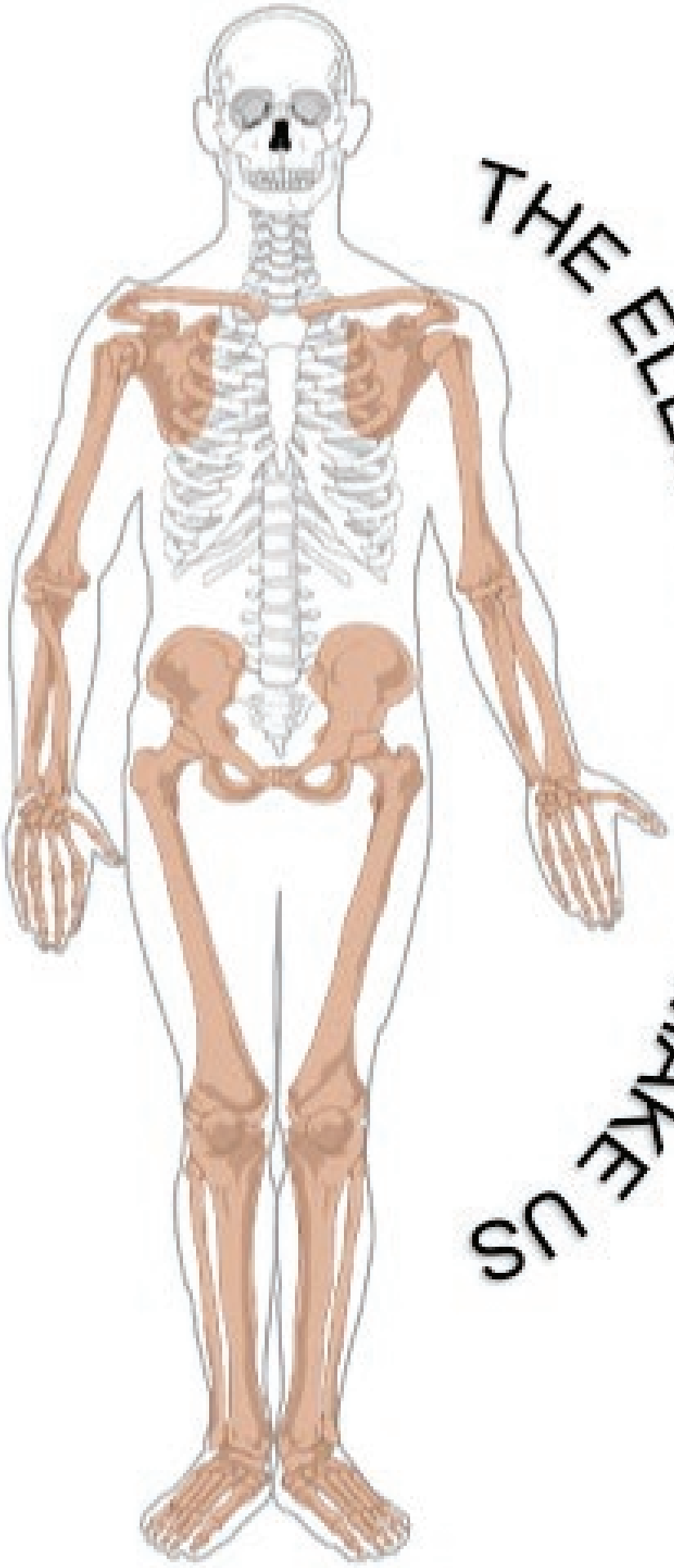

THE ELEMENTS THAT MAKE US

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Instructions – find out about the elements that make us

- Lay out food samples in containers (listed in table below).
- Lay out cut-outs of elements (element boxes).
- Participant to match element to the food that contains it.
- Answers on bottom of container.
- Information about the element printed on the element boxes.

Use talking points to think about how all the atoms that make us come from our food, the atoms are not changed in our body.

How it works/information to organiser

- Chosen foods (contain the elements C, O, H in addition to):

Element	Food
Calcium (Ca)	Milk/cheese
Magnesium (Mg)	Chocolate
Sodium (Na)	Table salt
Chlorine (Cl)	Bread
Phosphorus (P)	Rice
Chromium (Cr)	Oats
Copper (Cu)	Mushrooms
Potassium (K)	Banana
Selenium (Se)	Brazil nuts
Iron (Fe)	Beans
Zinc (Zn)	Eggs

Talking points:

- Foods are vegetarian and widely available. The idea is to have clear containers with the food, the answers as to which elements are contained in that food is underneath. Easy to access.
- Only considering essential elements (not necessarily pollutants).
- The colours of the boxes match up to the flame test/element colours where possible.
- There are 7 octillion (10^{27}) atoms in the body.
- 34 of the elements from the periodic table are found in the body, 28 of them make up less than 1%.
- "the dose is the poison"- some of the elements listed can be toxic at high concentrations but are essential in small amounts.
- These foods contain C, H and O as well as the others listed.
- The body cannot make atoms (unlike molecules) they need to be ingested.
- *https://www.compoundchem.com/2016/03/26/eggs/*
- *https://www.compoundchem.com/2016/03/16/chocolatecen/*
- *https://www.compoundchem.com/2016/01/20/bread-aroma/*
- *https://www.compoundchem.com/2015/10/09/mushrooms/*

Element boxes: info about the element and excess/ deficiency in diet.

To be printed, laminated and folded into a triangle (taped on the edge).

40.1 **Ca** Calcium 20	Discovered: 1808 *"The average human contains about 1 kilogram of calcium."*	Too much: Urinary stones Not enough (deficiency): Fragile bones and bad teeth
24.0 **Mg** Magnesium 12	Discovered: 1755 *"In humans, magnesium is essential to the working of hundreds of enzymes."*	Too much: Low blood pressure Not enough (deficiency): Circulatory disease

31.0 **P** Phosphorus 15	Discovered: 1669 *"Phosphorus forms the sugar-phosphate backbone of DNA."*	Too much: Ca absorption difficulty Not enough (deficiency): Decrease muscle strength
52.0 **Cr** Chromium 24	Discovered: 1798 *"Chromium is an essential trace element for humans because it helps us to use glucose."*	Too much: Liver and kidney disease Not enough (deficiency): Diabetes

63.5 **Cu** Copper 29	Discovered: Prehistoric *"Copper helps enzymes transfer energy in cells."*	Too much: Liver cirrhosis Not enough (deficiency): Hair loss
39.0 **K** Potassium 19	Discovered: 1807 *"Potassium ions are important for maintaining fluid and electrolyte balance."*	Too much: Excess Ca in the blood Not enough (deficiency): Vomiting

79.0 **Se** Selenium 34	Discovered: 1817 *"Every cell in a human body contains more than a million selenium atoms."*	Too much: Fatigue Not enough (deficiency): Heart disease
55.8 **Fe** Iron 26	Discovered: 3500BC *"The average human contains about 4 grams of iron. A lot of this is in in the blood."*	Too much: Shock Not enough (deficiency): Anaemia

65.4 **Zn** Zinc 30	Discovered: 20BC *"Zinc is essential for all living things, forming the active site in over 20 metallo-enzymes."*	Too much: Carcinogenic Not enough (deficiency): Skin inflammation

23.0 **Na** Sodium 11	Discovered: 1807 *"Sodium helps cells to transmit nerve signals and regulate water levels in tissues and blood."*	Too much: High blood pressure Not enough (deficiency): Muscle pain

35.5 **Cl** Chlorine 17	Discovered: 1774 *"The chloride ion is essential to life. It is mostly present in cell fluid as a negative ion to balance the positive ions."*	Too much: Would be removed by sweat Not enough (deficiency): Not likely

Sources

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