# Sum of the parts

KS1 KS2

10 is made up of 10 ones but can be made up of other numbers too

Can you split 10 so that each number is the same?

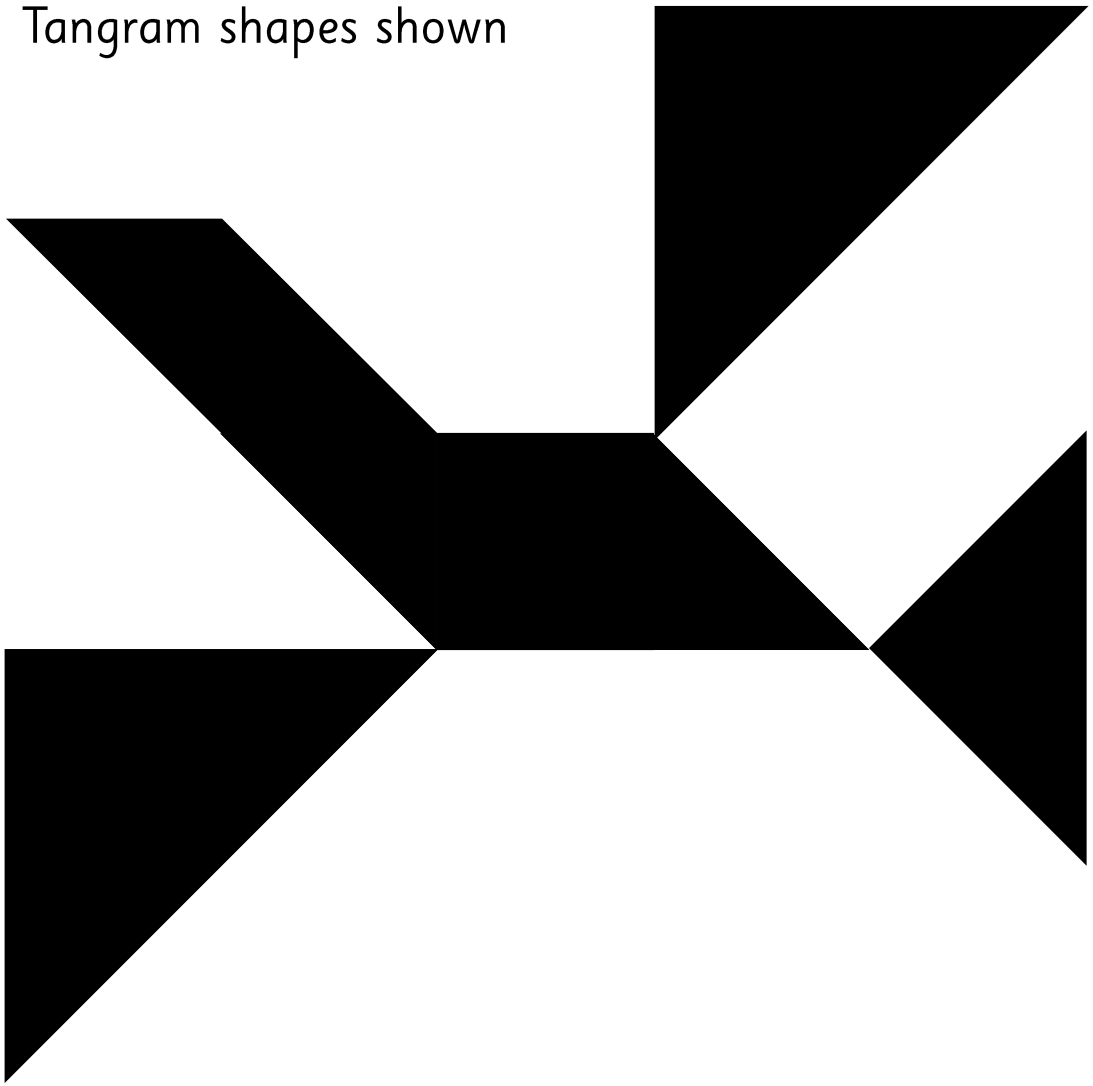
Use a different colour for each number

What about making each number different?

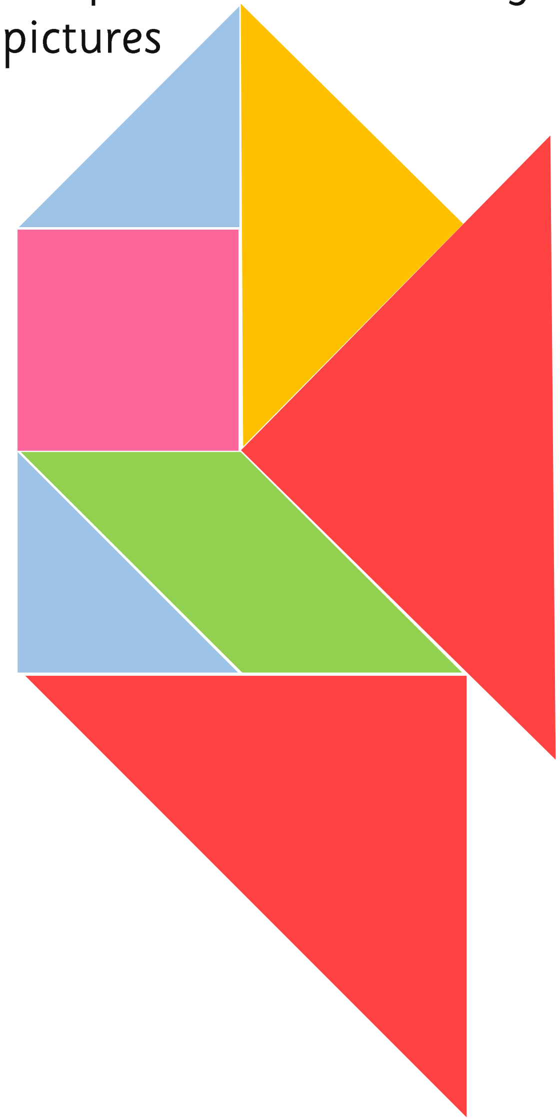
3 + 7 = 10

# Tangram

Have a go at making this picture with the Tangram shapes shown



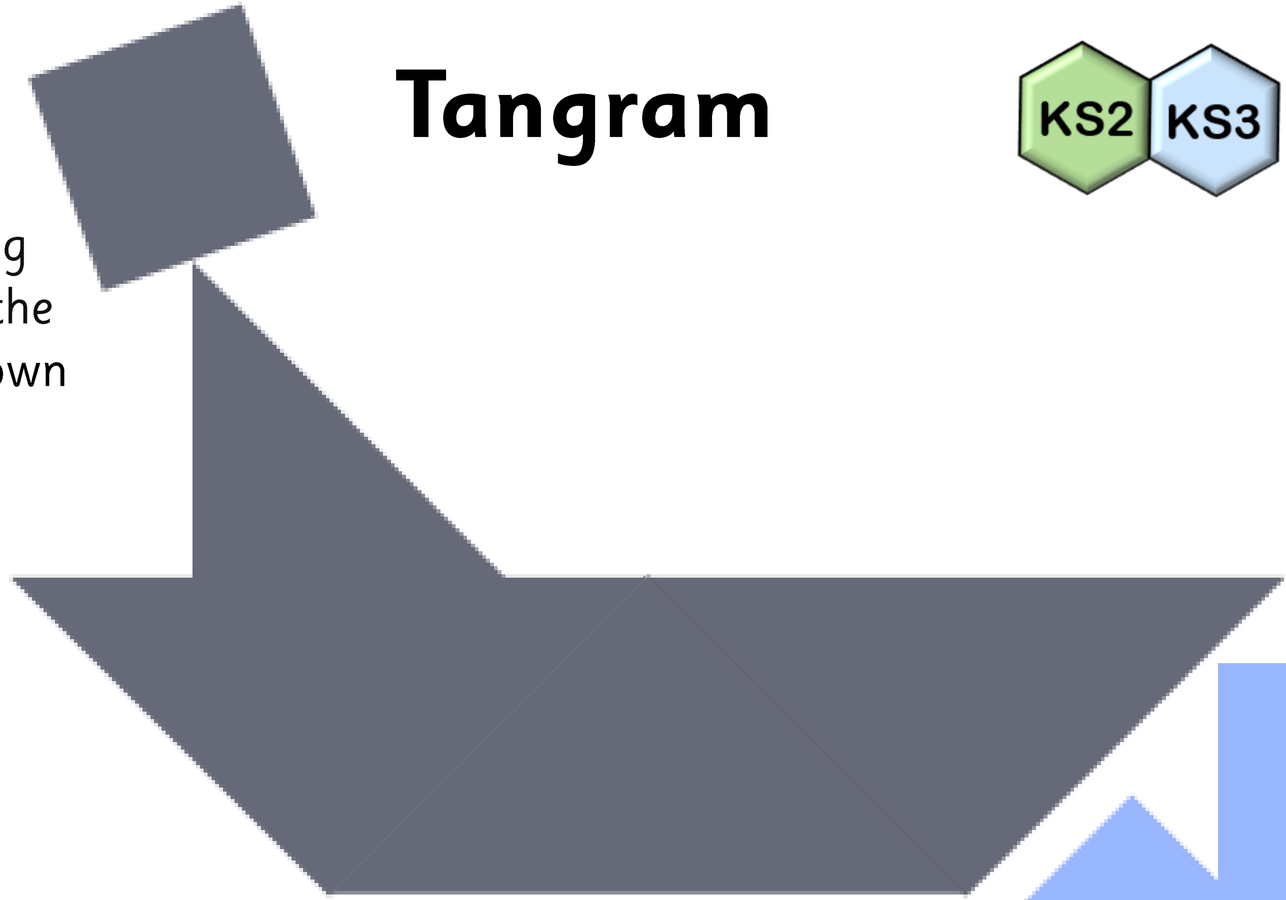
Cut these shapes out and rearrange to fit the pictures



# Tangram

KS2 KS3

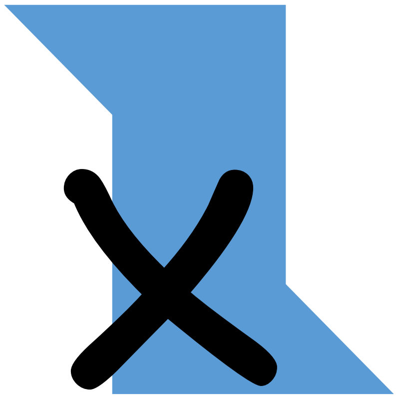
Have a go at making these pictures with the Tangram shapes shown



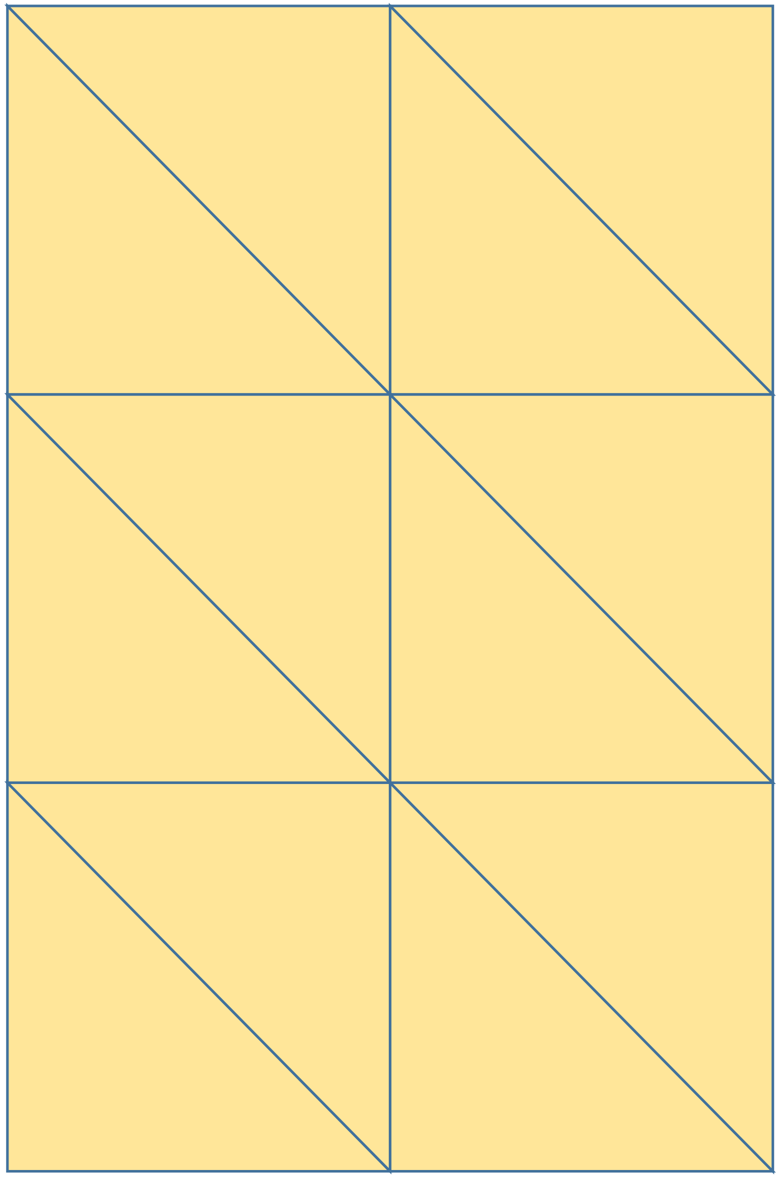
# Platonic Triangle

KS1 KS2

Cut out a few of these triangles and see what new shapes you can make with them. Can you make 5 new shapes that are all 5 sides or less?



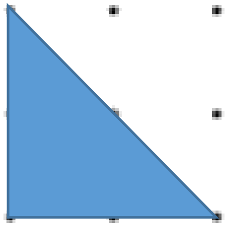
This shape is made of 2 triangles but has 6 sides so doesn't count.



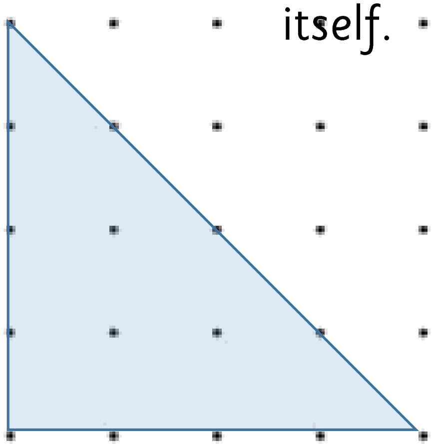
# Platonic Triangle

KS2

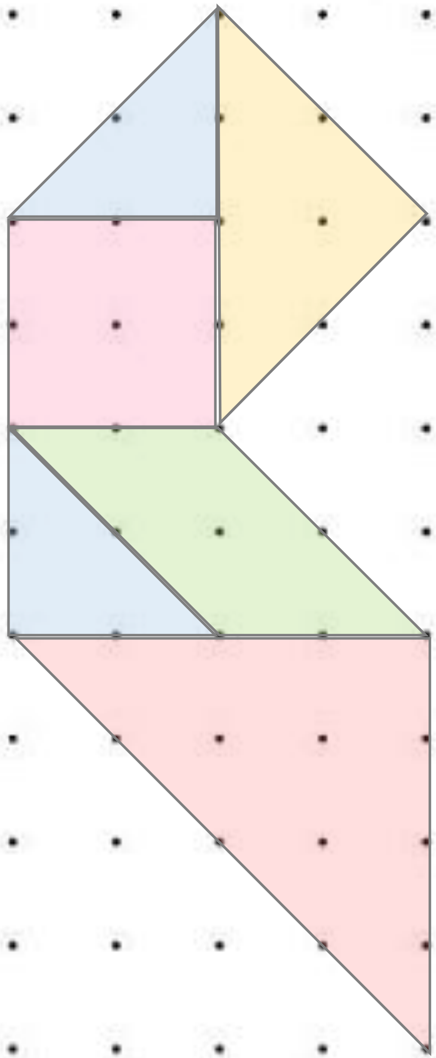
This is both a right-angled triangle and an isosceles triangle



It is also a repli-tile as it can be split into multiple smaller but similar versions of itself.

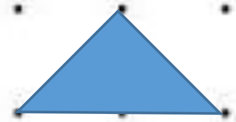


How many different sized versions of the above triangle can you make out of this?



The Tangram pieces that we used before can also be split into these triangles or smaller versions of these triangles.

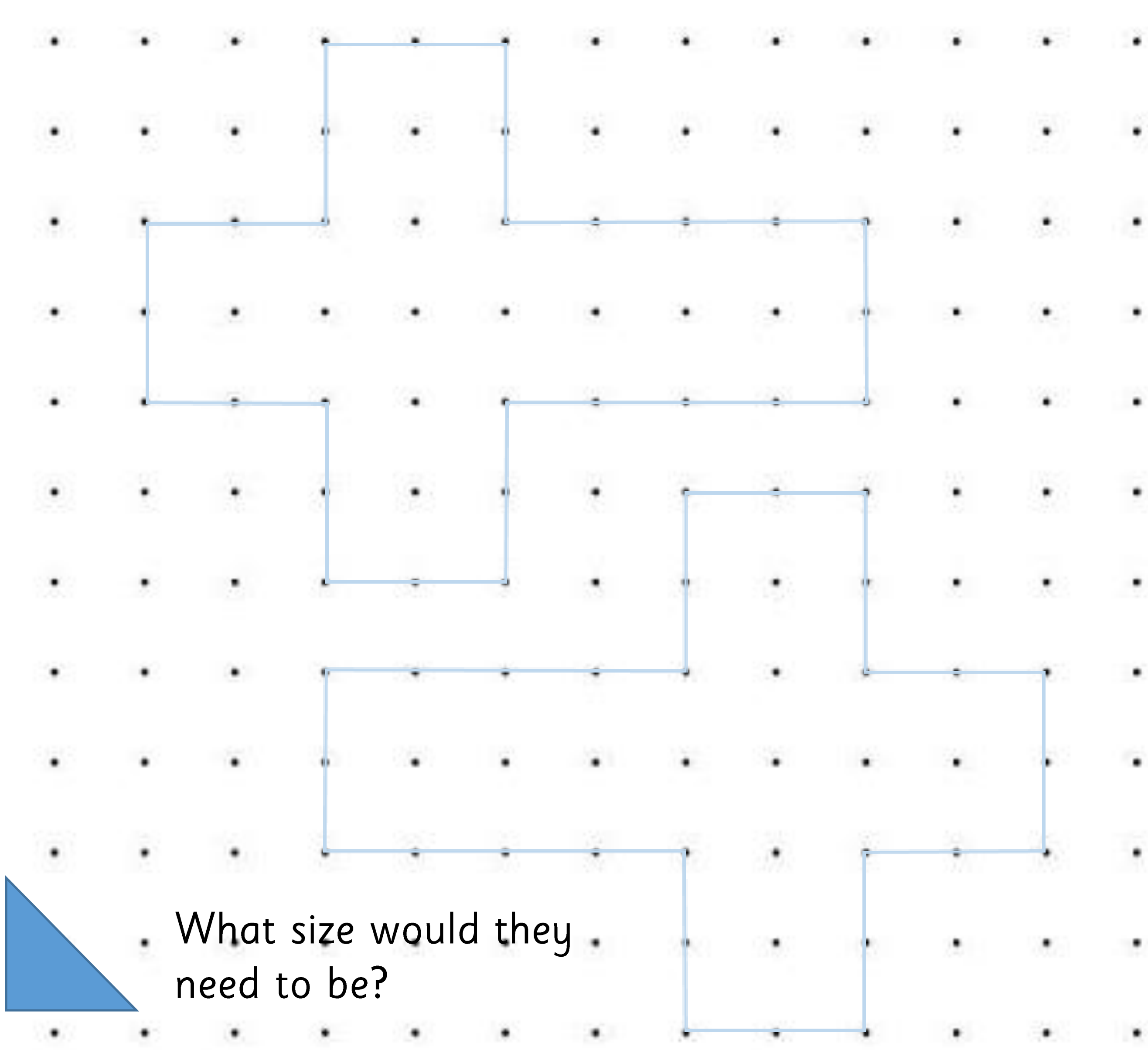
Try splitting these shapes into triangles that are this size



# Platonic Triangle

KS2 KS3

Plato is one of the most important Greek philosophers. He and many thinkers of his time described the universe as made of 4 or 5 fundamental elements: Earth, Water, Air and Fire. These 4 fundamental elements combined in different ways to make the material world. Plato also theorised that these elements were made up of even more fundamental elements. Earth, he claimed was based on a cube, which in turn was made with 24 of the triangles that we've been working with so far. Can you construct this cube net using 24 of these triangles?



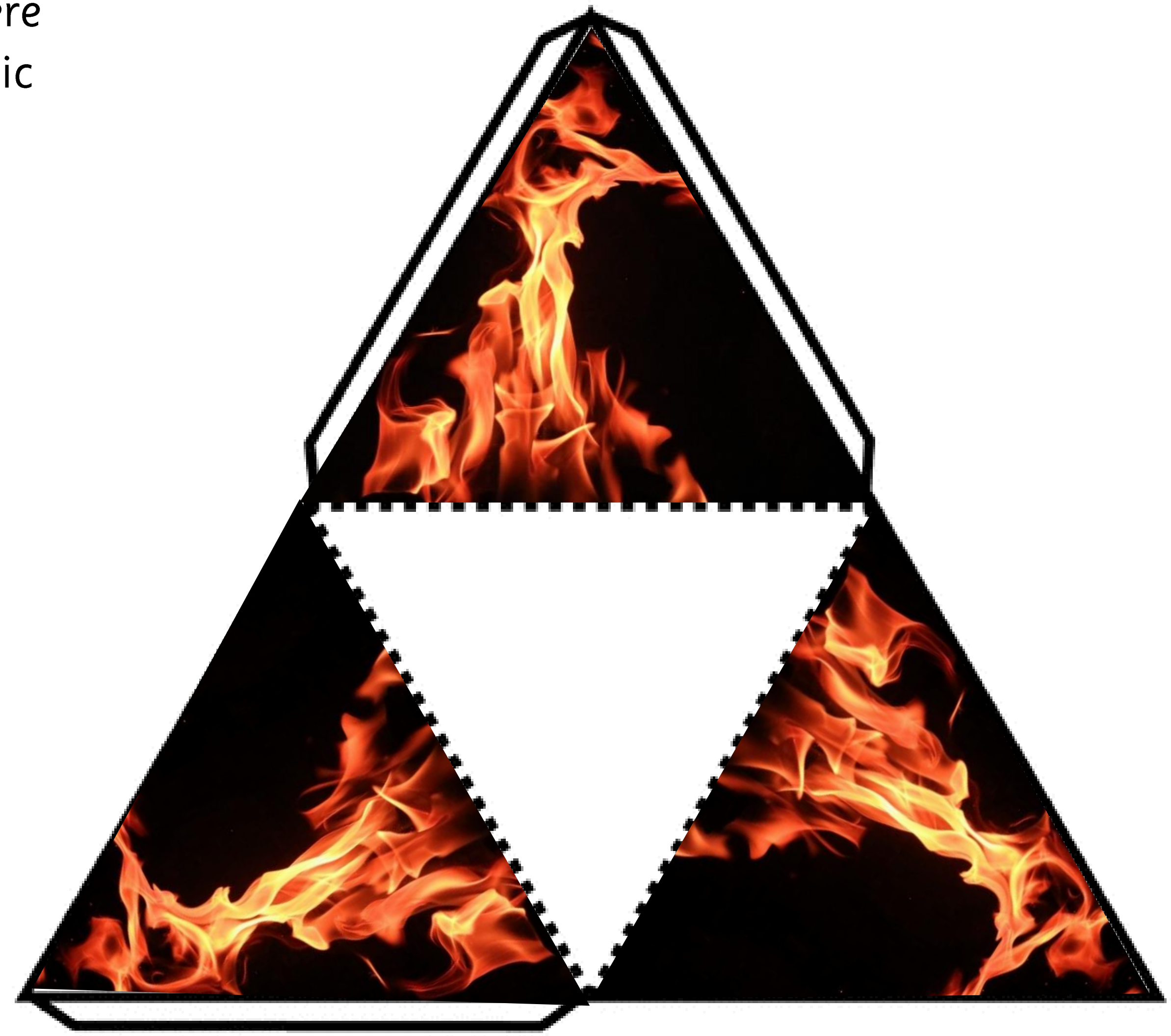
What size would they need to be?

# Shapes as Elements

KS1 KS2 KS3

Plato suggested in one of his books that the elements were shaped as particular Platonic solids as follows:

**Fire – tetrahedron**
Earth – Cube
Air – Octahedron
Water – icosahedron



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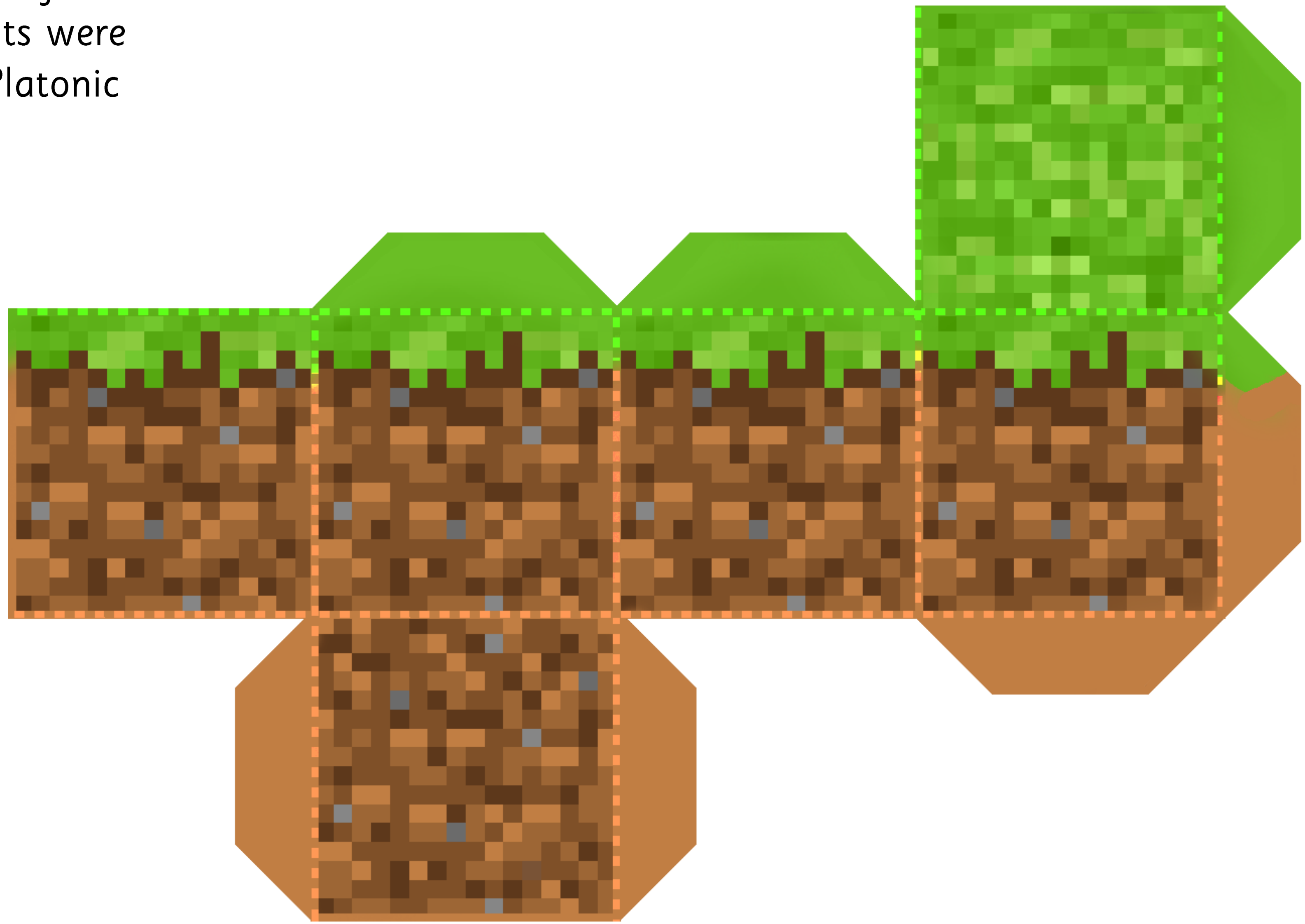

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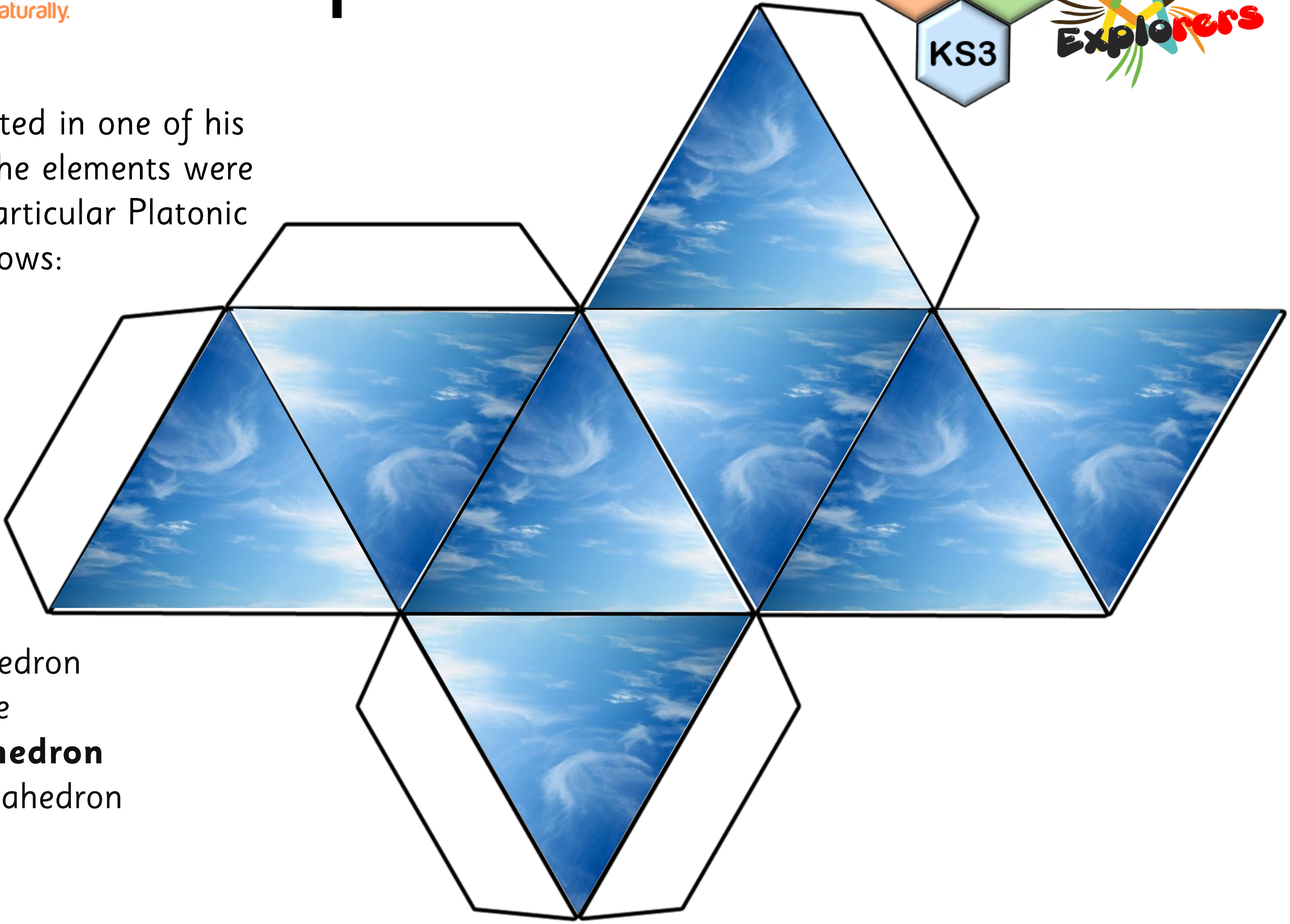

Fire – tetrahedron
Earth – Cube
**Air – Octahedron**
Water – icosahedron

# Shapes as Elements

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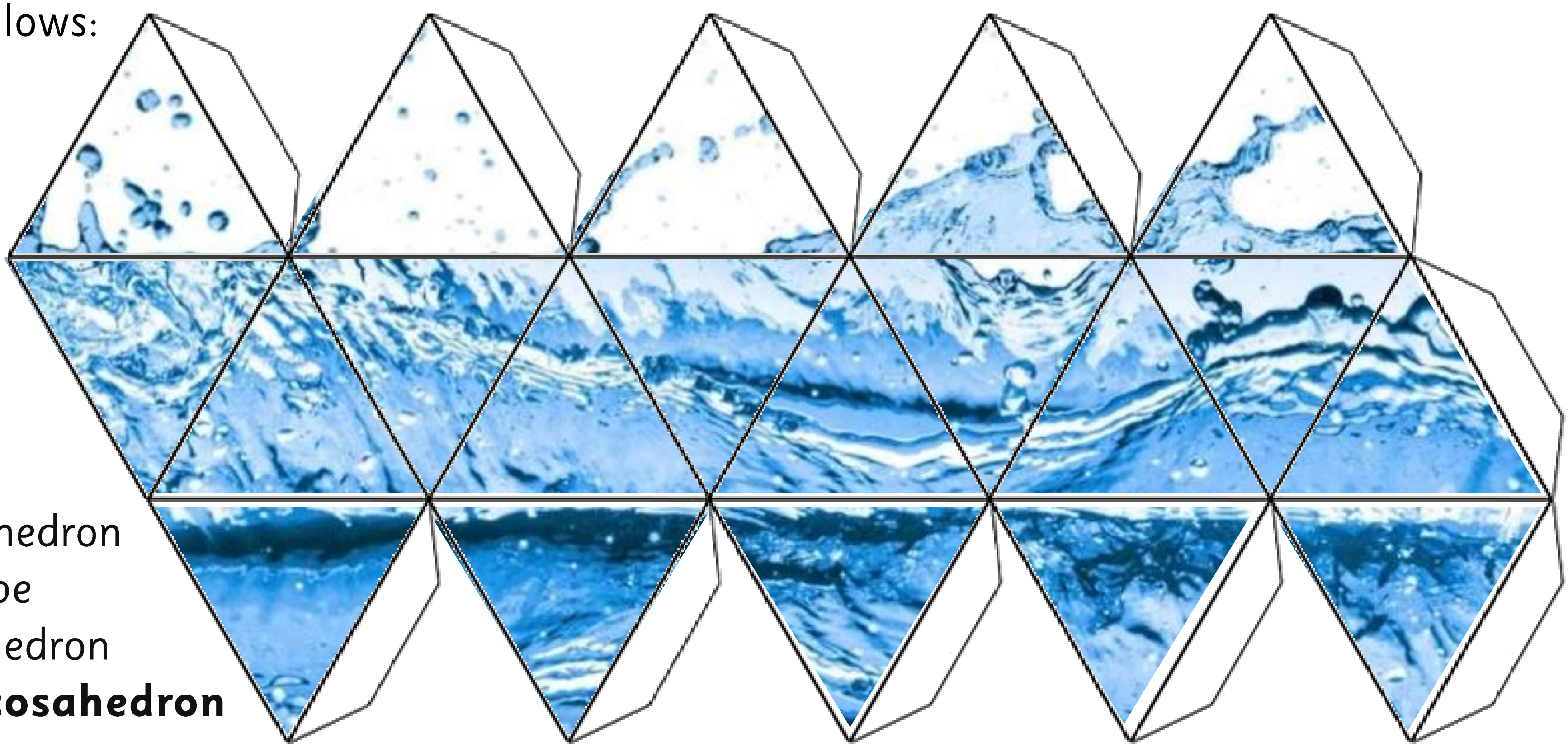
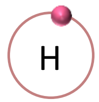


Fire – tetrahedron
Earth – Cube
Air – Octahedron
**Water – icosahedron**

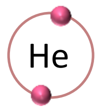
# Elements in the Modern World

These are models of a few of the atomic structure of elements that we know about.



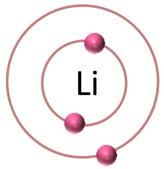

a) ________

b) ________



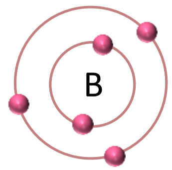

a) ________

b) ________




a) ________

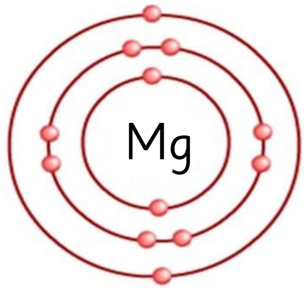
b) ________



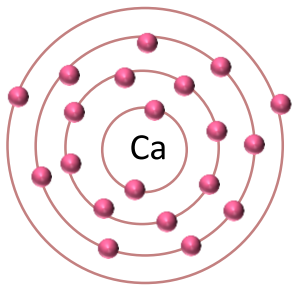

a) ________

b) ________

These just show that each atom has a number of shells (the circles surrounding it)

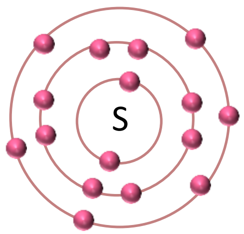



a) Number of shells: **3**
b) Electrons on outer shell: **2**




a) ________

b) ________



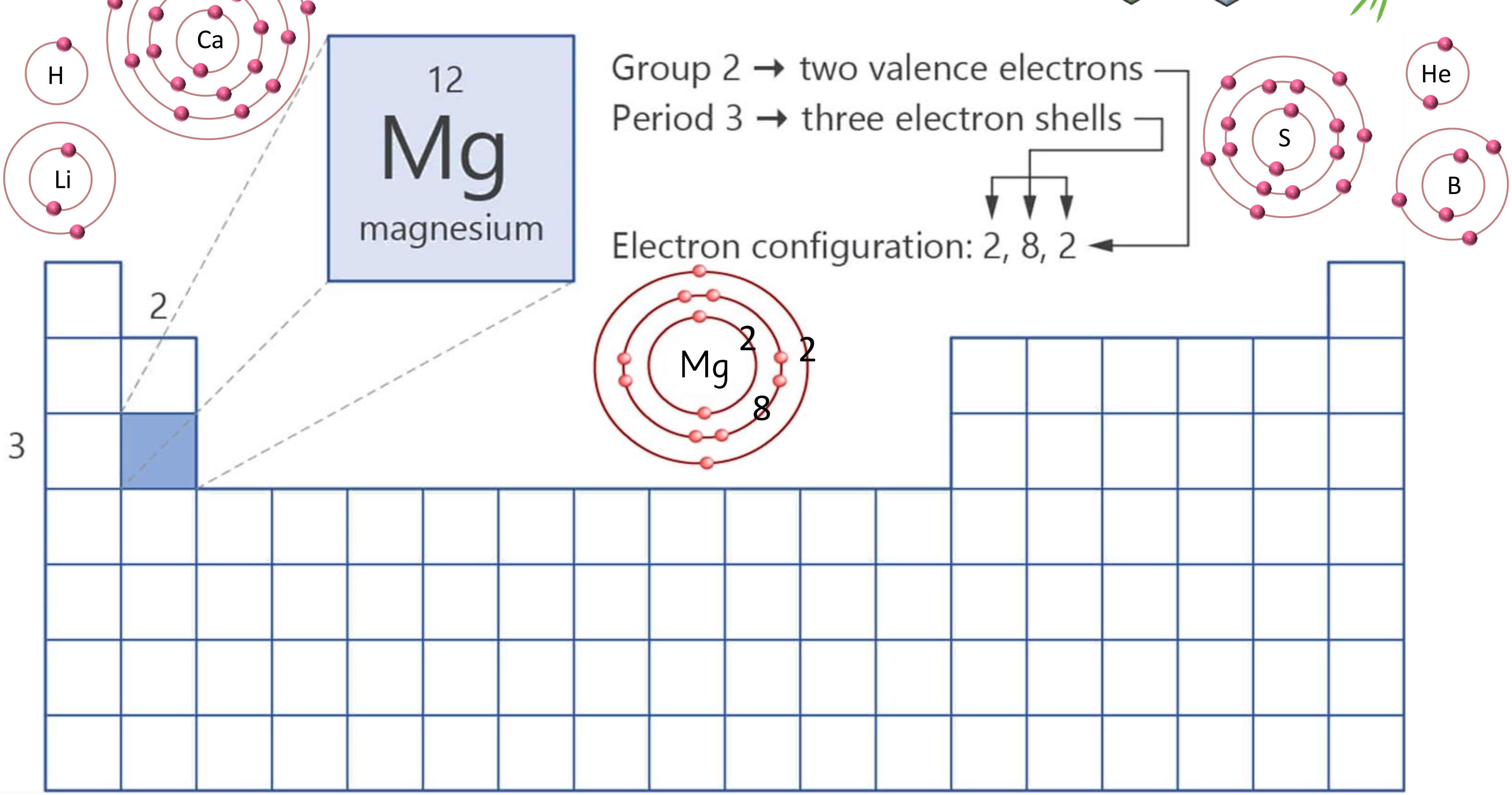

a) ________

b) ________

Each shell contains a number of atoms. We are mostly interested in the outer shell though.

Can you show a) how many shells each atom has and b) how many electrons on the outer shell?

# Elements in the Modern World

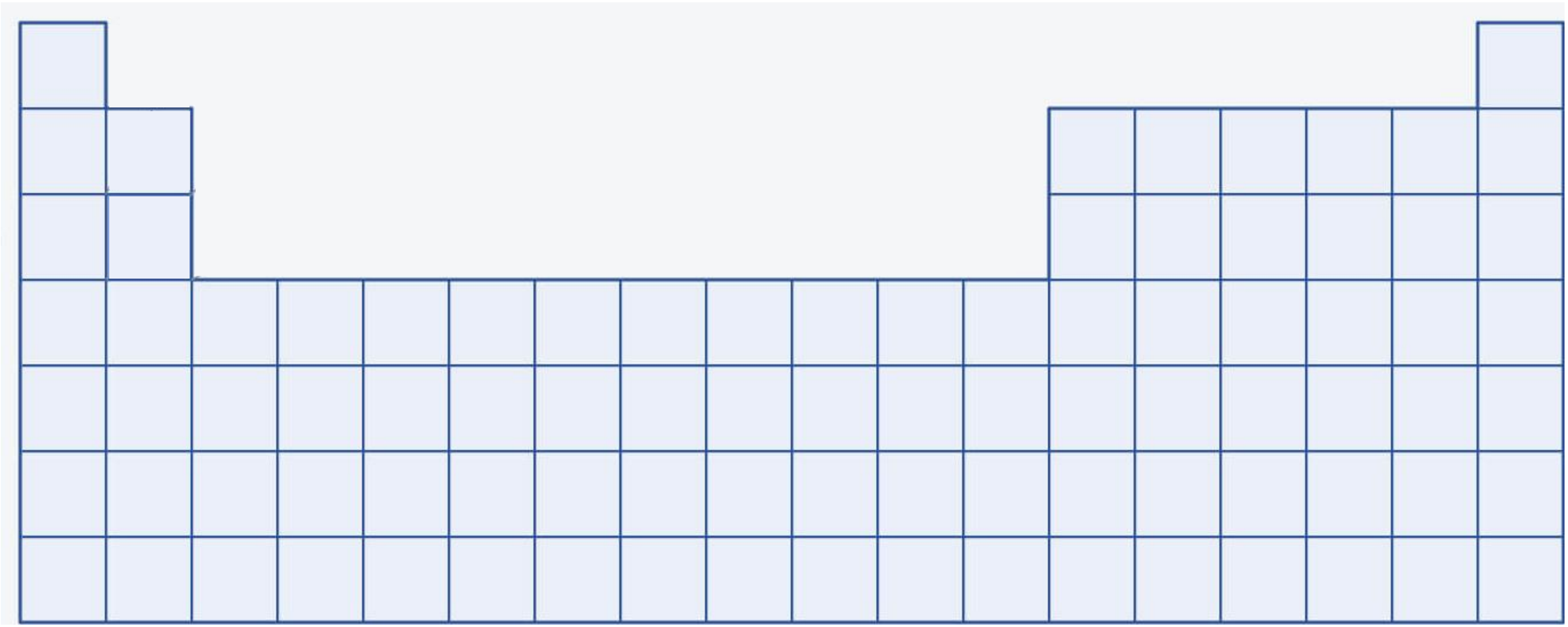



Can you figure out where the elements shown above would go in the periodic table?

# The Periodic Table

KS2 KS3

All the elements in the periodic table have been broken apart into jigsaw like poliominoes.
Can you find some clues to show how it should go back together?
Either cut them out and stick them in or write the information onto this table.



Can you place all the elements on this part of the periodic table? (See next page for elements)

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# The Periodic Table

KS2 KS3

Maths Explorers

| | | | |
|---|---|---|---|
| 122 Sb 51 antimony | 128 Te 52 tellurium | 127 I 53 iodine | 131 Xe 54 xenon |

| | |
|---|---|
| 119 Sn 50 tin | |
| 207 Pb 82 lead | 209 Bi 83 bismuth |
| | 295 Mc 115 moscovium |

| |
|---|
| 1 H 1 hydrogen |
| 7 Li 3 lithium |
| 23 Na 11 sodium |

| | |
|---|---|
| 204 Tl 81 thallium | |
| 284 Nh 113 nihonium | 289 Fl 114 Flerovium |

| |
|---|
| 70 Ga 31 gallium |
| 115 In 49 indium |

| | | |
|---|---|---|
| 209 Po 84 polonium | 210 At 85 astatine | 222 Rn 86 radon |
| 297 Lv 116 livermorium | 291 Ts 117 tennessine | 293 Og 118 oganesson |

| | |
|---|---|
| | 65 Zn 30 zinc |
| 108 Ag 47 silver | 112.5 Cd 48 cadmium |
| | 201 Hg 80 mercury |

| | |
|---|---|
| 35.5 Cl 17 chlorine | 40 Ar 18 argon |
| 80 Br 35 bromine | 84 Kr 36 krypton |

| | | |
|---|---|---|
| | 98 Tc 43 technetium | 101 Ru 44 ruthenium |
| | 186 Re 75 rhenium | |
| 263 Sg 106 seaborgium | 264 Bh 107 bohrium | |

| | |
|---|---|
| 59 Ni 28 nickel | 63 Cu 29 copper |
| 106.5 Pd 46 palladium | |
| 195 Pt 78 platinum | |

| | | |
|---|---|---|
| 55 Mn 25 manganese | 56 Fe 26 iron | 59 Co 27 cobalt |
| | | 103 Rh 45 rhodium |
| | 190 Os 76 osmium | 192 Ir 77 iridium |
| | 265 Hs 108 hassium | 268 Mt 109 meitnerium |

| | |
|---|---|
| | 4 He 2 helium |
| 19 F 9 fluorine | 20 Ne 10 neon |

| | | |
|---|---|---|
| | | 178.5 Hf 72 hafnium |
| 226 Ra 88 radium | 260 Lr 103 lawrencium | 261 Rf 104 rutherfordium |

| | | |
|---|---|---|
| 133 Cs 55 caesium | 137 Ba 56 barium | 175 Lu 71 lutetium |
| 223 Fr 87 francium | | |

| | | |
|---|---|---|
| | 197 Au 79 gold | |
| 281 Ds 110 darmstadtium | 281 Rg 111 roentgenium | 285 Cn 112 copernicium |

| | | | |
|---|---|---|---|
| 39 K 19 potassium | | | 48 Ti 22 titanium |
| 85.5 Rb 37 rubidium | 88 Sr 38 strontium | 89 Y 39 yttrium | 91 Zr 40 zirconium |

| | |
|---|---|
| 14 N 7 nitrogen | 16 O 8 oxygen |
| 31 P 15 phosphorous | 32 S 16 sulfur |
| 75 As 33 arsenic | 79 Se 34 selenium |

| | |
|---|---|
| 11 B 5 boron | 12 C 6 carbon |
| 27 Al 13 aluminium | 28 Si 14 silicon |
| | 73 Ge 32 germanium |

| | |
|---|---|
| 9 Be 4 beryllium | |
| 24 Mg 12 magnesium | |
| 40 Ca 20 calcium | 45 Sc 21 scandium |

| | |
|---|---|
| 51 V 23 vanadium | 52 Cr 24 chromium |
| | 96 Mo 42 molybdenum |
| | 184 W 74 tungsten |

| |
|---|
| 93 Nb 41 niobium |
| 181 Ta 73 tantalum |
| 262 Db 105 dubnium |

These pieces come from the Periodic table