

Exploring Inside Atoms

Combined science - Physics - Key stage 4 - Atomic Structure

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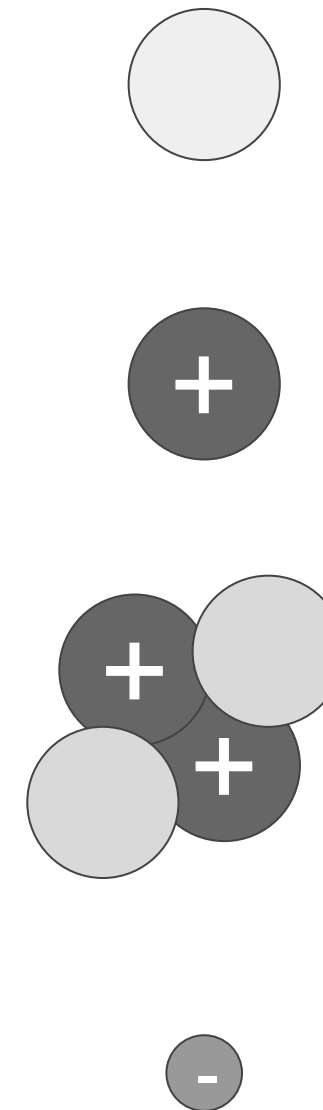
Match up these key words to the diagram that represents it.

Protons

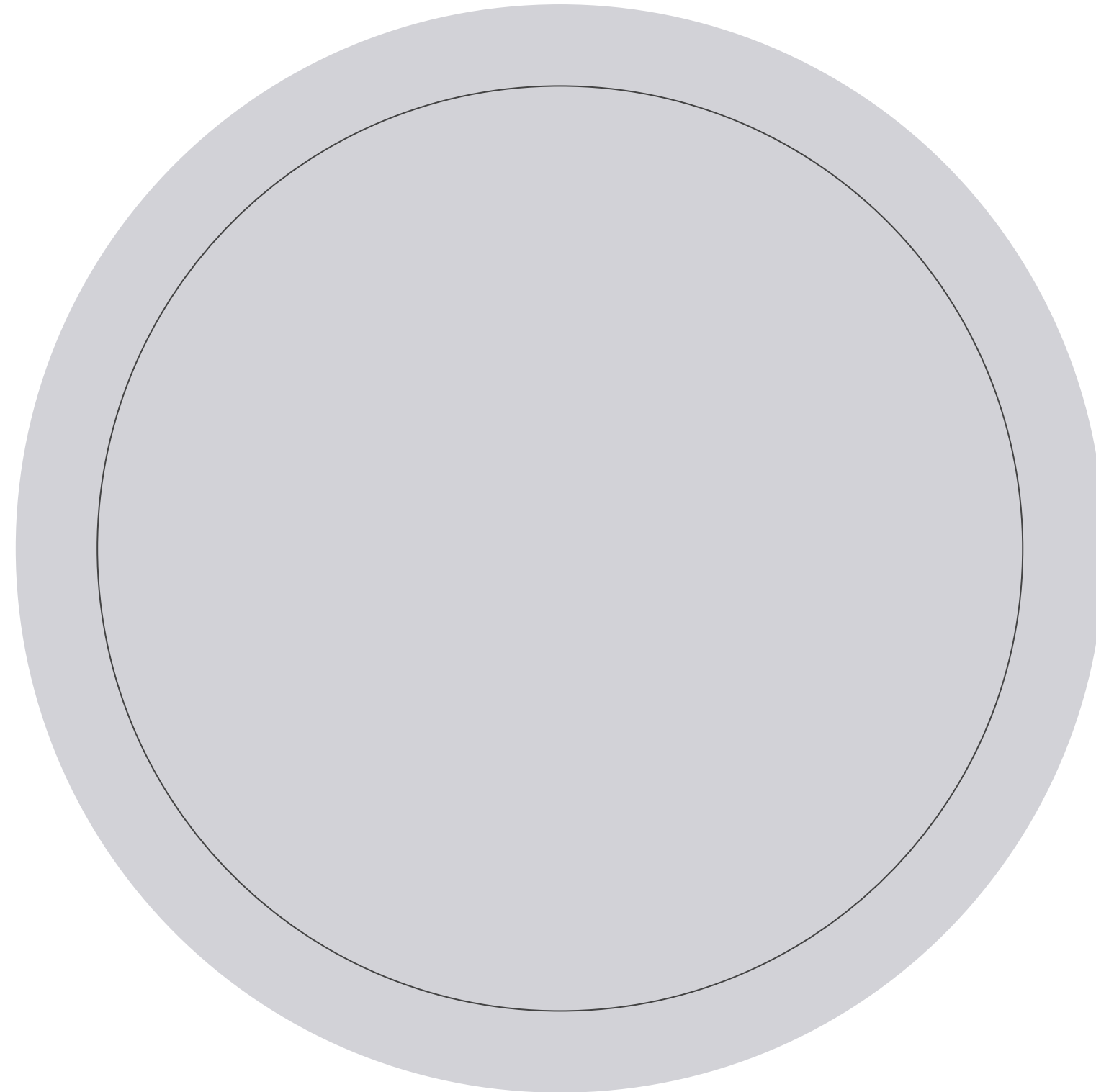
Nucleus

Electrons


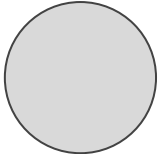

Neutrons



Draw a labelled diagram of an atom



What is each particle like?

Particle		Charge	Relative mass
Proton			
Neutron			
Electron			



Independent practise

1. What is the charge on the nucleus?
 - The charge on the nucleus is _____
2. Why is the charge on an atom neutral?
 - The charge on an atom is _____ because there are _____ numbers of _____ and _____.
3. An atom has 5 protons in its nucleus. What is the charge on the nucleus and the charge of the atom overall? Use numbers.
 - The charge on the nucleus is _____ and the charge on the atom overall is _____.



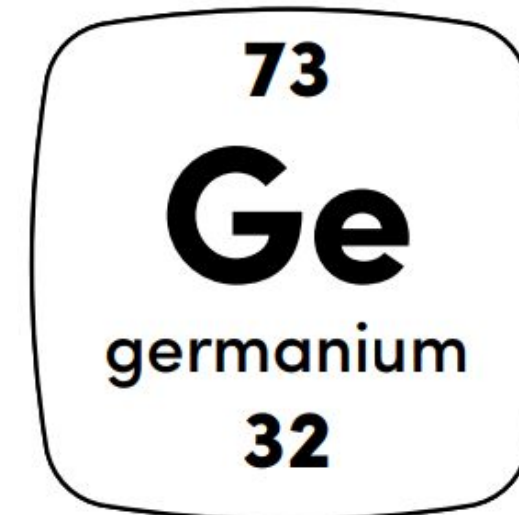
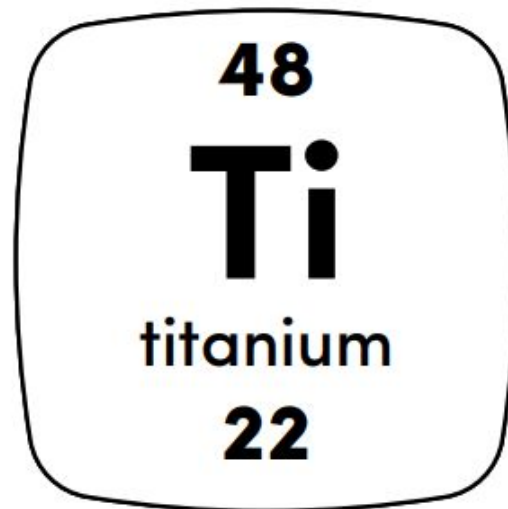
Independent practise

1. There are 118 different types of a_____. They differ in their numbers of p_____, n_____ and e_____. If a s_____ is made of one type of atom, it is called an e_____. The different atoms and the name of the elements they make up are found in the p_____ t_____ of e_____ and are represented by a symbol (e.g. Na = _____).
2. If an atom has 9 protons and no neutrons, what would its relative mass be?
3. If an atom has 12 neutrons only, what would its relative mass be?
4. An atom has 14 neutrons and 8 protons. What would its relative mass be?
5. An atom has 21 neutrons, 20 protons and 20 electrons. What is its relative mass?



Nuclear notation

For the two atoms below, state the protons and the number of neutrons



Periodic Table of Elements

Key:

relative atomic mass

Atomic symbol

Name

Atomic (proton number)

1

H

hydrogen

1

4

He

helium

2

<div>7</div> <div>Li</div> <div>lithium</div> <div>3</div>	<div>9</div> <div>Be</div> <div>beryllium</div> <div>4</div>											<div>11</div> <div>B</div> <div>boron</div> <div>5</div>	<div>12</div> <div>C</div> <div>carbon</div> <div>6</div>	<div>14</div> <div>N</div> <div>nitrogen</div> <div>7</div>	<div>16</div> <div>O</div> <div>oxygen</div> <div>8</div>	<div>19</div> <div>F</div> <div>fluorine</div> <div>9</div>	<div>20</div> <div>Ne</div> <div>neon</div> <div>10</div>
<div>23</div> <div>Na</div> <div>sodium</div> <div>11</div>	<div>24</div> <div>Mg</div> <div>magnesium</div> <div>12</div>											<div>27</div> <div>Al</div> <div>aluminium</div> <div>13</div>	<div>28</div> <div>Si</div> <div>silicon</div> <div>14</div>	<div>31</div> <div>P</div> <div>phosphorus</div> <div>15</div>	<div>32</div> <div>S</div> <div>sulfur</div> <div>16</div>	<div>35.5</div> <div>Cl</div> <div>chlorine</div> <div>17</div>	<div>40</div> <div>Ar</div> <div>argon</div> <div>18</div>
<div>39</div> <div>K</div> <div>potassium</div> <div>19</div>	<div>40</div> <div>Ca</div> <div>calcium</div> <div>20</div>	<div>45</div> <div>Sc</div> <div>scandium</div> <div>21</div>	<div>48</div> <div>Ti</div> <div>titanium</div> <div>22</div>	<div>51</div> <div>V</div> <div>vanadium</div> <div>23</div>	<div>52</div> <div>Cr</div> <div>chromium</div> <div>24</div>	<div>55</div> <div>Mn</div> <div>manganese</div> <div>25</div>	<div>56</div> <div>Fe</div> <div>iron</div> <div>26</div>	<div>59</div> <div>Co</div> <div>cobalt</div> <div>27</div>	<div>59</div> <div>Ni</div> <div>nickel</div> <div>28</div>	<div>63.5</div> <div>Cu</div> <div>copper</div> <div>29</div>	<div>65</div> <div>Zn</div> <div>zinc</div> <div>30</div>	<div>70</div> <div>Ga</div> <div>gallium</div> <div>31</div>	<div>73</div> <div>Ge</div> <div>germanium</div> <div>32</div>	<div>75</div> <div>As</div> <div>arsenic</div> <div>33</div>	<div>79</div> <div>Se</div> <div>selenium</div> <div>34</div>	<div>80</div> <div>Br</div> <div>bromine</div> <div>35</div>	<div>84</div> <div>Kr</div> <div>krypton</div> <div>36</div>
<div>85</div> <div>Rb</div> <div>rubidium</div> <div>37</div>	<div>88</div> <div>Sr</div> <div>strontium</div> <div>38</div>	<div>89</div> <div>Y</div> <div>yttrium</div> <div>39</div>	<div>91</div> <div>Zr</div> <div>zirconium</div> <div>40</div>	<div>93</div> <div>Nb</div> <div>niobium</div> <div>41</div>	<div>96</div> <div>Mo</div> <div>molybdenum</div> <div>42</div>	<div>[97]</div> <div>Tc</div> <div>technetium</div> <div>43</div>	<div>101</div> <div>Ru</div> <div>ruthenium</div> <div>44</div>	<div>103</div> <div>Rh</div> <div>rhodium</div> <div>45</div>	<div>106</div> <div>Pd</div> <div>palladium</div> <div>46</div>	<div>108</div> <div>Ag</div> <div>silver</div> <div>47</div>	<div>112</div> <div>Cd</div> <div>cadmium</div> <div>48</div>	<div>115</div> <div>In</div> <div>indium</div> <div>49</div>	<div>119</div> <div>Sn</div> <div>tin</div> <div>50</div>	<div>122</div> <div>Sb</div> <div>antimony</div> <div>51</div>	<div>128</div> <div>Te</div> <div>tellurium</div> <div>52</div>	<div>127</div> <div>I</div> <div>iodine</div> <div>53</div>	<div>131</div> <div>Xe</div> <div>xenon</div> <div>54</div>
<div>133</div> <div>Cs</div> <div>caesium</div> <div>55</div>	<div>137</div> <div>Ba</div> <div>barium</div> <div>56</div>	<div>139</div> <div>La*</div> <div>lanthanum</div> <div>57</div>	<div>178</div> <div>Hf</div> <div>hafnium</div> <div>72</div>	<div>181</div> <div>Ta</div> <div>tantalum</div> <div>73</div>	<div>184</div> <div>W</div> <div>tungsten</div> <div>74</div>	<div>186</div> <div>Re</div> <div>rhenium</div> <div>75</div>	<div>190</div> <div>Os</div> <div>osmium</div> <div>76</div>	<div>192</div> <div>Ir</div> <div>iridium</div> <div>77</div>	<div>195</div> <div>Pt</div> <div>platinum</div> <div>78</div>	<div>197</div> <div>Au</div> <div>gold</div> <div>79</div>	<div>201</div> <div>Hg</div> <div>mercury</div> <div>80</div>	<div>204</div> <div>Tl</div> <div>thallium</div> <div>81</div>	<div>207</div> <div>Pb</div> <div>lead</div> <div>82</div>	<div>209</div> <div>Bi</div> <div>bismuth</div> <div>83</div>	<div>[209]</div> <div>Po</div> <div>polonium</div> <div>84</div>	<div>[210]</div> <div>At</div> <div>astatine</div> <div>85</div>	<div>[222]</div> <div>Rn</div> <div>radon</div> <div>86</div>
<div>[223]</div> <div>Fr</div> <div>francium</div> <div>87</div>	<div>[226]</div> <div>Ra</div> <div>radium</div> <div>88</div>	<div>[227]</div> <div>Ac*</div> <div>actinium</div> <div>89</div>	<div>[267]</div> <div>Rf</div> <div>rutherfordium</div> <div>104</div>	<div>[270]</div> <div>Db</div> <div>dubnium</div> <div>105</div>	<div>[269]</div> <div>Sg</div> <div>seaborgium</div> <div>106</div>	<div>[270]</div> <div>Bh</div> <div>bohrium</div> <div>107</div>	<div>[270]</div> <div>Hs</div> <div>hassium</div> <div>108</div>	<div>[278]</div> <div>Mt</div> <div>meitnerium</div> <div>109</div>	<div>[281]</div> <div>Ds</div> <div>darmstadtium</div> <div>110</div>	<div>[281]</div> <div>Rg</div> <div>roentgenium</div> <div>87</div>	<div>[285]</div> <div>Cn</div> <div>copernicium</div> <div>112</div>	<div>[286]</div> <div>Nh</div> <div>nihonium</div> <div>113</div>	<div>[289]</div> <div>Fl</div> <div>flerovium</div> <div>114</div>	<div>[289]</div> <div>Mc</div> <div>moscovium</div> <div>115</div>	<div>[293]</div> <div>Lv</div> <div>livermorium</div> <div>116</div>	<div>[293]</div> <div>Ts</div> <div>tennessine</div> <div>117</div>	<div>[294]</div> <div>Og</div> <div>oganesson</div> <div>118</div>



Use a periodic table to find the following information.

1. The number of protons in Carbon.
2. The number of protons in Helium.
3. The number of electrons in Zinc.
4. The number of neutrons in Sodium.
5. The number of neutrons in Iron.
6. The proton number of Copper.
7. The number of electrons in Rb.
8. The proton number of Ge.
9. The overall charge on the atom of W.
10. The number of neutrons in phosphorus.

