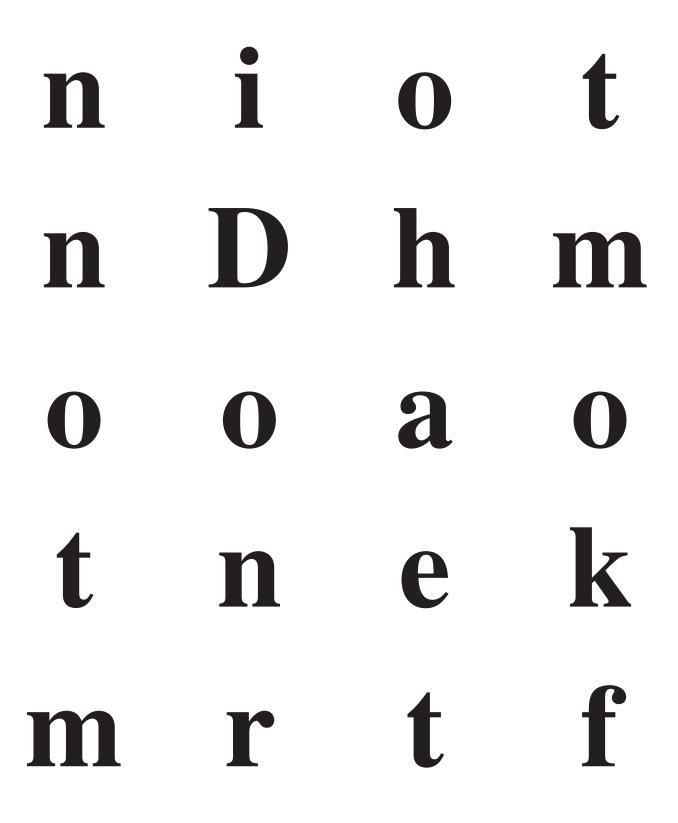
Atomic number for Cl	Mass number for <sup>16</sup> <sub>8</sub> O	Number of neutrons in ${}^{46}_{20}$ Ca	Number of electrons in a neutral cerium atom
Set 1	Set 1	Set 1	Set 1
Number of protons in a Ba <sup>2+</sup> ion	Atomic number of a +1 ion having 18 electrons	Mass number of an atom with 1 proton, 1 neutron, and 1 electron	Number of protons in an element with atomic number 12
Set 1	Set 1	Set 1	Set 1
Atomic number of a +3 ion with 30 neutrons and 27 electrons	Number of neutrons in <sup>75</sup> As	Mass number of a neutral atom with 30 neutrons and 25 electrons	Number of electrons in a O <sup>2–</sup> ion
Set 1	Set 1	Set 1	Set 1
Number of electrons in a neutral nickel atom	Number of protons in a neutral atom with 82 neutrons and 57 electrons	Number of protons in Co <sup>3+</sup>	Atomic number of <sup>36</sup> <sub>18</sub> Ar
Set 1	Set 1	Set 1	Set 1
Number of protons in Cu <sup>+</sup>	Mass number of an ion with 28 protons, 32 neutrons, and 26 electrons	Number of neutrons in <sup>64</sup> Zn <sup>2+</sup>	Number of electrons in a neutral atom with atomic number 52
Set 1	Set 1	Set 1	Set 1



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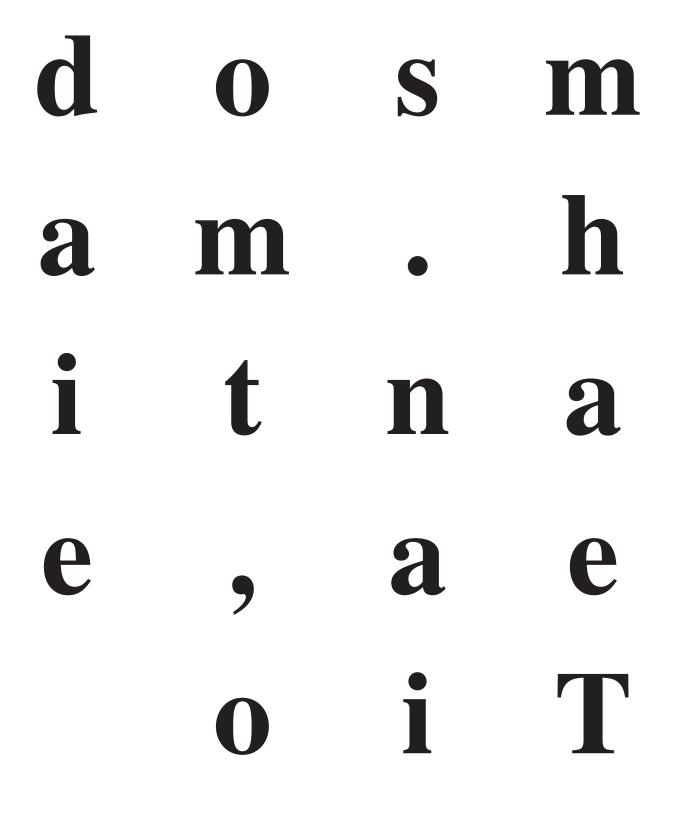
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Atomic number of potassium	Number of protons in <sup>23</sup> Na <sup>+</sup>	Mass number of an atom with 4 protons, 4 electrons and 5 neutrons	Number of neutrons in <sup>15</sup> <sub>7</sub> N
Set 2	Set 2	Set 2	Set 2
Number of electrons in F <sup>-</sup>	Number of electrons in a neutral magnesium atom	Number of electrons in P <sup>3–</sup>	Mass number of an ion with 8 protons, 10 electrons, and 9 neutrons
Set 2	Set 2	Set 2	Set 2
Number of protons in a neutral atom with 30 neutrons and 25 electrons	Number of neutrons in <sup>37</sup> Cl	Number of protons in an element with atomic number 13	Number of electrons in a neutral iron atom
Set 2	Set 2	Set 2	Set 2
Number of neutrons in a <sup>41</sup> K <sup>+</sup> ion	Atomic number of a –2 ion having 18 electrons	Number of protons in a Sc <sup>3+</sup> ion	Atomic number of <sup>59</sup> <sub>27</sub> Co
Set 2	Set 2	Set 2	Set 2
Mass number of <sup>14</sup> <sub>7</sub> N	Mass number of a +1 ion with 12 neutrons, and 10 electrons	Mass number of a neutral atom with 12 neutrons and 12 electrons	Number of electrons in a neutral atom with atomic number 15
Set 2	Set 2	Set 2	Set 2

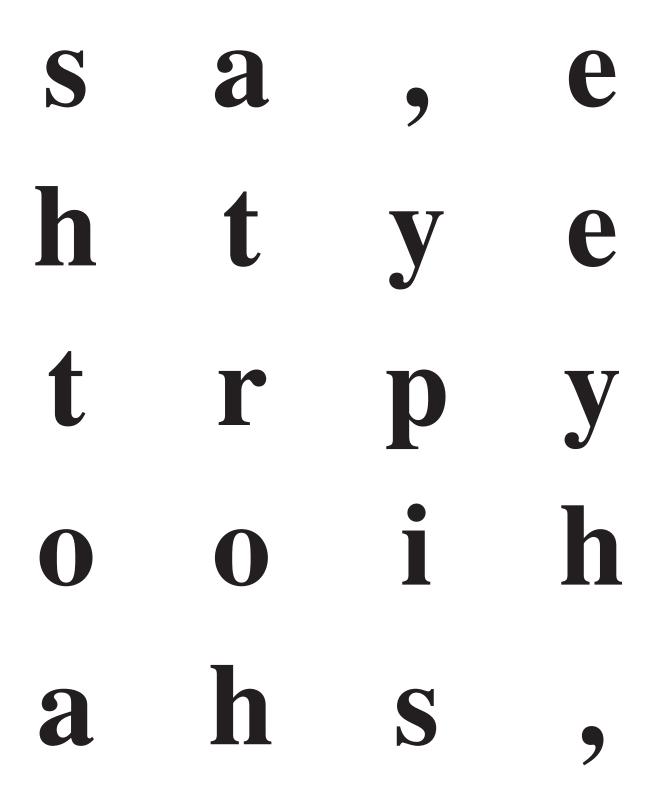


Number of protons in a K <sup>+</sup> ion	Number of electrons in a neutral atom with atomic number 21	Number of electrons in a neutral carbon atom	Number of protons in an element with atomic number 25
Set 3	Set 3	Set 3	Set 3
Number of protons in a silicon atom	Number of electrons in a Mg <sup>2+</sup> ion	Number of neutrons in a <sup>17</sup> O <sup>2–</sup> ion	Atomic number of a –2 ion with 18 electrons
Set 3	Set 3	Set 3	Set 3
Mass number of a neutral atom with 12 neutrons and 10 electrons	Number of electrons in a neutral vanadium atom	Number of neutrons in <sup>33</sup> S	Number of protons in a neutral atom with 24 neutrons and 20 electrons
Set 3	Set 3	Set 3	Set 3
Mass number of a +2 ion with 14 neutrons and 10 electrons	Atomic number of zinc	Mass number of ${}^{56}_{26}$ Fe	Number of neutrons in <sup>29</sup> <sub>14</sub> Si
Set 3	Set 3	Set 3	Set 3
Mass number of an atom with 6 protons, 7 neutrons, and 6 electrons	Atomic number of <sup>53</sup> <sub>24</sub> Cr	Number of electrons for <sup>37</sup> Cl <sup>-</sup>	Mass number of an ion with 6 protons, 6 electrons, and 6 neutrons
Set 3	Set 3	Set 3	Set 3

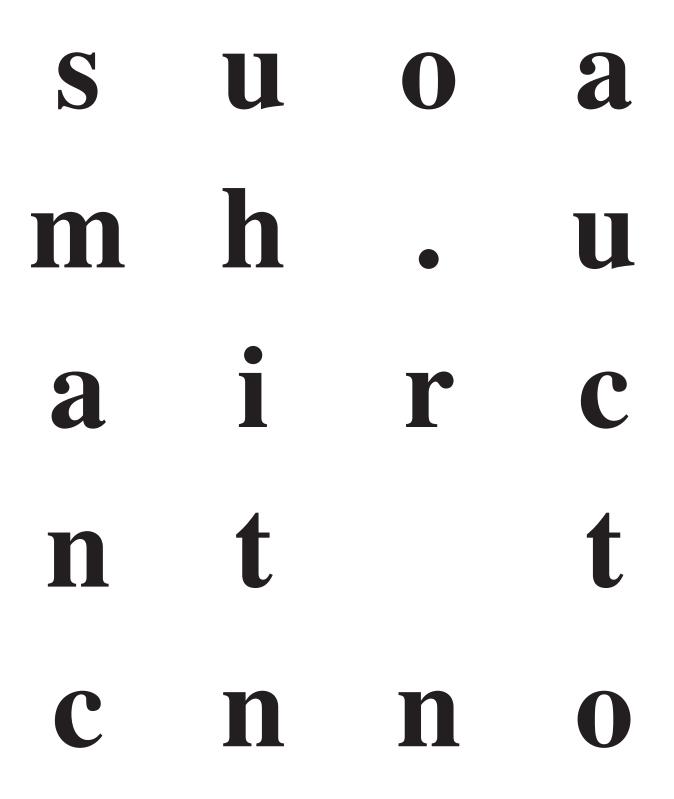


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Atomic number of silver	Number of neutrons in <sup>91</sup> Zr	Number of protons in Cl <sup>-</sup>	Mass number of a neutral atom with 36 neutrons and 30 electrons
Set 4	Set 4	Set 4	Set 4
Number of electrons in a neutral terbium atom	Number of neutrons in <sup>88</sup> <sub>38</sub> Sr	Mass number of an ion with 27 protons, 25 electrons, and 32 neutrons	Mass number of <sup>60</sup> <sub>28</sub> Ni
Set 4	Set 4	Set 4	Set 4
Mass number of an atom with 24 protons, 30 neutrons and 24 electrons	Number of protons in a neutral atom with 80 neutrons and 56 electrons	Number of electrons in a neutral indium atom	Number of protons in a Rh <sup>3+</sup> ion
Set 4	Set 4	Set 4	Set 4
Number of electrons in a Ag <sup>+</sup> ion	Atomic number of <sup>165</sup> <sub>67</sub> Ho	Number of electrons in a +2 ion of tin	Number of electrons in a neutral atom with atomic number 58
Set 4	Set 4	Set 4	Set 4
Mass number of a +4 ion with 72 neutrons and 48 electrons	Mass number of an atom with 32 protons and 42 neutrons	Atomic number of a –1 ion having 54 electrons	Number of protons in a tellurium atom
Set 4	Set 4	Set 4	Set 4



Number of electrons in Ba <sup>2+</sup>	Number of neutrons in <sup>143</sup> <sub>60</sub> Nd	Mass number of an ion with 30 protons, 28 electrons, and 38 neutrons	Number of protons in a neutral atom with 111 neutrons and 76 electrons
Set 5	Set 5	Set 5	Set 5
Mass number of a -1 ion with 44 neutrons and 36 electrons	Mass number of an atom with 37 protons, 37 electrons, and 49 neutrons	Number of electrons in a neutral europium atom	Mass number of <sup>70</sup> <sub>32</sub> Ge
Set 5	Set 5	Set 5	Set 5
Number of neutrons in <sup>125</sup> Te	Number of neutrons in <sup>133</sup> <sub>55</sub> Cs <sup>+</sup>	Number of protons in Pb <sup>4+</sup>	Atomic number of <sup>175</sup> <sub>71</sub> Lu
Set 5	Set 5	Set 5	Set 5
Number of electrons in a neutral iridium atom	Mass number of a neutral atom with 49 neutrons and 38 electrons	Atomic number of thallium	Number of protons in an atom with atomic number 72
Set 5	Set 5	Set 5	Set 5
Atomic number of a +4 ion with 70 electrons	Number of electrons in a neutral At atom	Number of electrons in a neutral atom with atomic number 75	Number of protons in a Hg <sup>+</sup> ion
Set 5	Set 5	Set 5	Set 5



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Atomic number of silver	Number of electrons in a neutral atom with atomic number 58	Number of neutrons in <sup>97</sup> <sub>42</sub> Mo	Atomic number of <sup>144</sup> <sub>60</sub> Nd
Set 6	Set 6	Set 6	Set 6
Number of electrons in a neutral rhodium atom	Number of neutrons in <sup>86</sup> <sub>37</sub> Rb	Atomic number of a –1 ion having 54 electrons	Mass number of a neutral atom with 38 neutrons and 31 electrons
Set 6	Set 6	Set 6	Set 6
Mass number of an atom with 22 protons, 22 electrons, and 24 neutrons	Number of protons in an element with atomic number 59	Number of electrons in a Cs <sup>+</sup> ion	Number of protons in Sn <sup>4+</sup>
Set 6	Set 6	Set 6	Set 6
Number of electrons in a neutral zirconium atom	Number of electrons in Sn <sup>2+</sup>	Number of protons in an Sb <sup>3+</sup> ion	Mass number of an ion with 26 protons, 23 electrons and 31 neutrons
Set 6	Set 6	Set 6	Set 6
Number of neutrons in a <sup>109</sup> Ag <sup>+</sup> ion	Mass number of <sup>63</sup> <sub>29</sub> Cu	Number of protons in a neutral atom with 68 neutrons and 52 electrons	Mass number of a Ce <sup>4+</sup> ion with 82 neutrons and 54 electrons
Set 6	Set 6	Set 6	Set 6



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Number of electrons in a neutral phosphorus atom	Atomic number of copper	Number of protons in <sup>18</sup> O <sup>2–</sup>	Mass number of an atom with 12 protons, 12 electrons, and 12 neutrons
Set 7	Set 7	Set 7	Set 7
Number of electrons in S <sup>2–</sup>	Number of neutrons in an <sup>56</sup> Fe <sup>3+</sup> ion	Number of neutrons for <sup>60</sup> Ni	Number of protons in a neutral atom with 18 neutrons and 16 electrons
Set 7	Set 7	Set 7	Set 7
Number of neutrons in <sup>59</sup> Ni	Number of neutrons in <sup>68</sup> <sub>30</sub> Zn	Number of protons in an <sup>27</sup> Al <sup>3+</sup> ion	Mass number of a neutral atom with 17 electrons and 18 neutrons
Set 7	Set 7	Set 7	Set 7
Mass number of a –3 ion with 7 neutrons and 10 electrons	Number of protons in a manganese atom	Number of electrons in a Sr <sup>2+</sup> ion	Number of electrons in a neutral cobalt atom
Set 7	Set 7	Set 7	Set 7
Atomic number of a +4 ion having 26 neutrons and 18 electrons	Atomic number of <sup>39</sup> <sub>19</sub> K	Mass number of an ion with 21 protons, 19 electrons, and 24 neutrons	Mass number of <sup>28</sup> <sub>14</sub> Si
Set 7	Set 7	Set 7	Set 7

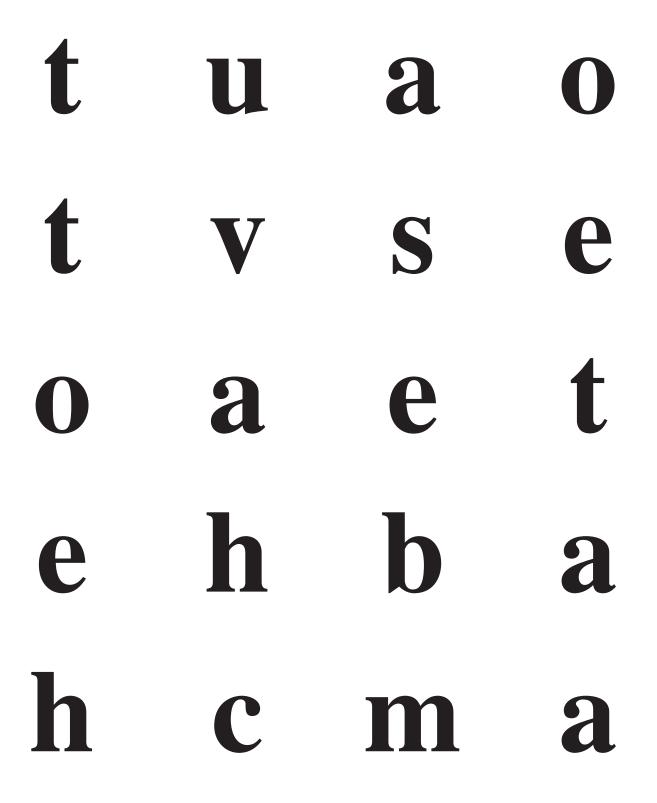


Number of neutrons in <sup>105</sup> <sub>46</sub> Pd	Number of neutrons for <sup>91</sup> Zr	Atomic number of indium	Mass number of an atom with 32 protons, 32 electrons, and 40 neutrons
Set 8	Set 8	Set 8	Set 8
Number of protons in Sn <sup>2+</sup>	Number of electrons in a neutral nickel atom	Mass number of a Cl <sup>-</sup> ion with 20 neutrons and 18 electrons	Mass number of <sup>62</sup> <sub>28</sub> Ni
Set 8	Set 8	Set 8	Set 8
Atomic number of yttrium	Number of electrons in a neutral atom with atomic number 25	Number of protons in a <sup>80</sup> Se <sup>2–</sup> ion	Number of protons in an element with atomic number 32
Set 8	Set 8	Set 8	Set 8
Number of electrons in <sup>56</sup> Fe <sup>3+</sup>	Number of electrons in a Br <sup>-</sup> ion	Atomic number of a –2 ion having 18 electrons	Mass number of a neutral atom with 22 neutrons and 20 electrons
Set 8	Set 8	Set 8	Set 8
Number of protons in a <sup>65</sup> Zn <sup>2+</sup> ion	Atomic number of <sup>91</sup> <sub>40</sub> Zr	Number of protons in a neutral atom with 49 neutrons and 38 electrons	Mass number of a +1 ion with 46 electrons and 62 neutrons
Set 8	Set 8	Set 8	Set 8

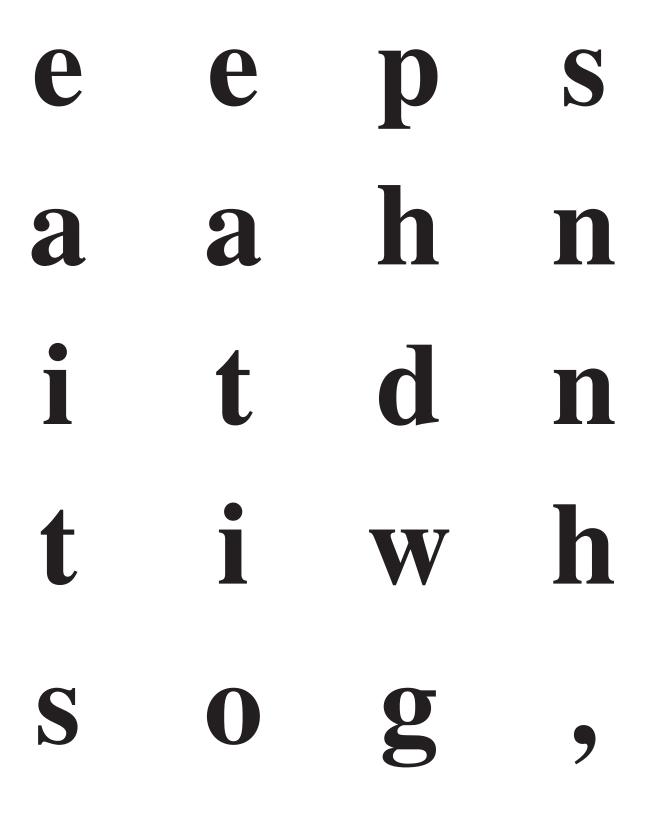
# S r J X r e f e e C e

**Atomic Structure Puzzle** 

Number of protons in O <sup>2-</sup>	Number of neutrons in <sup>7</sup> Li	Number of neutrons in <sup>20</sup> Ne	Mass number of an atom with 5 protons, 5 electrons, and 6 neutrons
Set 9	Set 9	Set 9	Set 9
Atomic number of hydrogen	Number of electrons in a neutral <sup>11</sup> B atom	Number of electrons in a Sr <sup>2+</sup> ion	Atomic number of a +2 ion having 10 electrons
Set 9	Set 9	Set 9	Set 9
Number of neutrons in <sup>31</sup> <sub>15</sub> P	Number of protons in a neutral atom with 16 neutrons and 14 electrons	Number of protons in a carbon atom	Atomic number of <sup>35</sup> <sub>17</sub> Cl
Set 9	Set 9	Set 9	Set 9
Number of electrons in a neutral atom with atomic number 15	Number of electrons in a neutral nitrogen atom	Mass number of <sup>19</sup> <sub>9</sub> F	Mass number of a neutral atom with 20 neutrons and 18 electrons
Set 9	Set 9	Set 9	Set 9
Number of neutrons in a <sup>41</sup> K <sup>+</sup> ion	Mass number of an ion with 8 protons, 10 electrons, and 10 neutrons	Mass number of a +2 ion with 34 neutrons and 26 electrons	Number of protons in an element with atomic number 13
Set 9	Set 9	Set 9	Set 9

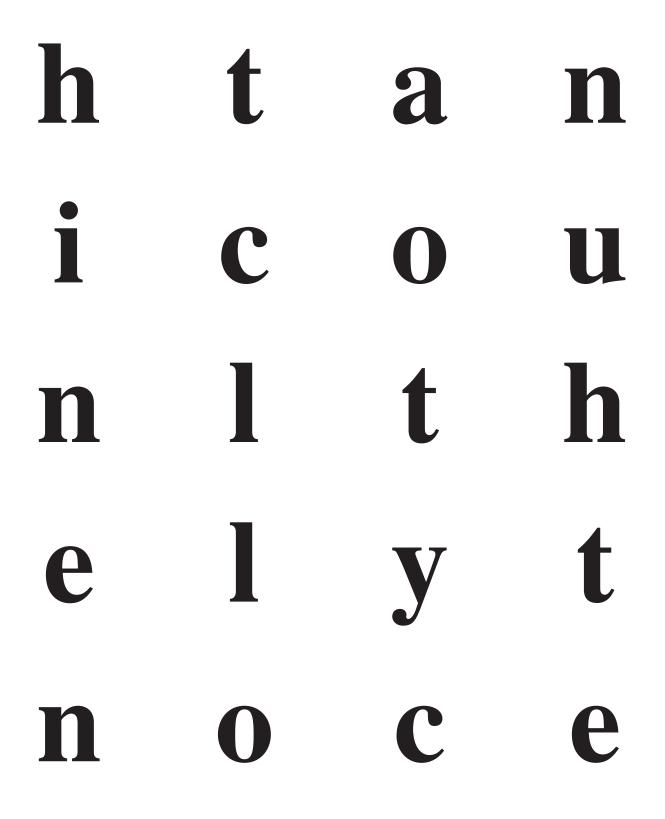


Number of protons in Sn <sup>4+</sup>	Number of neutrons in <sup>70</sup> Ge	Number of neutrons	Number of neutrons in a <sup>59</sup> Ni <sup>2+</sup> ion
Set 10	Set 10	Set 10	Set 10
Atomic number of selenium	Number of electrons in a Rb <sup>+</sup> ion	Mass number of an ion with 19 protons, 18 electrons, and 20 neutrons	Number of electrons in a <sup>32</sup> S <sup>2–</sup> ion
Set 10	Set 10	Set 10	Set 10
Number of electrons in a neutral potassium atom	Number of electrons in a neutral atom with atomic number 32	Mass number of an atom with 21 protons, 21 electrons, and 24 neutrons	Number of protons in an element with atomic number 33
Set 10	Set 10	Set 10	Set 10
Atomic number of a +2 ion with 13 neutrons and 10 electrons	Atomic number of a –1 ion having 54 electrons	Number of electrons in a Pb <sup>2+</sup> ion	Number of protons in an element with atomic number 35
Set 10	Set 10	Set 10	Set 10
Number of protons in a <sup>111</sup> Cd <sup>2+</sup> ion	Atomic number of <sup>68</sup> <sub>30</sub> Zn	Number of protons in a neutral atom with 72 neutrons and 51 electrons	Mass number of <sup>40</sup> <sub>18</sub> Ar
Set 10	Set 10	Set 10	Set 10



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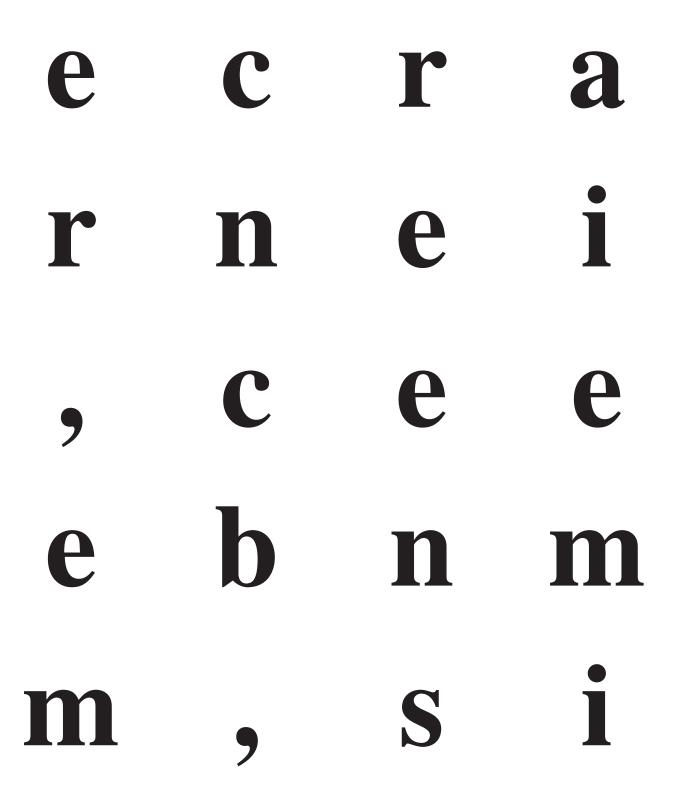
Number of electrons in P <sup>3–</sup>	Number of neutrons in <sup>59</sup> <sub>27</sub> Co	Mass number of an atom with 9 protons, 9 electrons, and 10 neutrons	Number of electrons in a Cu <sup>2+</sup> ion
Set 11	Set 11	Set 11	Set 11
Number of electrons in a neutral titanium atom	Number of protons in S <sup>2–</sup>	Number of neutrons in <sup>29</sup> Si	Number of protons in <sup>40</sup> Ca <sup>2+</sup>
Set 11	Set 11	Set 11	Set 11
Atomic number for neon	Atomic number of a +6 ion having 18 electrons	Number of protons in a neutral atom with 6 neutrons and 6 electrons	Number of electrons in a neutral bromine atom
Set 11	Set 11	Set 11	Set 11
Number of electrons in a neutral <sup>19</sup> F atom	Number of neutrons in a <sup>26</sup> Mg <sup>2+</sup> ion	Mass number of a +1 ion with 4 neutrons and 2 electrons	Number of protons in an element with atomic number 23
Set 11	Set 11	Set 11	Set 11
Mass number of an atom with 5 protons, 5 electrons, and 6 neutrons	Atomic number of <sup>56</sup> <sub>26</sub> Fe	Mass number of a +2 ion with 12 protons, 10 electrons, and 13 neutrons	Mass number of <sup>21</sup> <sub>10</sub> Ne
Set 11	Set 11	Set 11	Set 11



Mass number of an atom with 14 electrons, 14 protons, and 16 neutrons	Number of protons in <sup>59</sup> Co	Number of electrons in a neutral potassium atom	Number of electrons in <sup>31</sup> P <sup>3-</sup>
Set 12	Set 12	Set 12	Set 12
Atomic number of iron	Number of neutrons in <sup>23</sup> <sub>11</sub> Na	Number of protons in a Ca <sup>2+</sup> ion	Number of electrons in an <sup>27</sup> Al <sup>3+</sup> ion
Set 12	Set 12	Set 12	Set 12
Atomic number of a +2 ion having 27 electrons	Number of protons in a <sup>59</sup> Ni <sup>2+</sup> ion	Number of electrons in a neutral titanium atom	Mass number of a neutral atom with 18 neutrons and 16 electrons
Set 12	Set 12	Set 12	Set 12
Number of protons in <sup>31</sup> P <sup>3-</sup>	Number of protons in an element with atomic number 9	Number of protons in <sup>52</sup> Cr <sup>3+</sup>	Atomic number of ${}^{51}_{23}$ V
Set 12	Set 12	Set 12	Set 12
Mass number of a –1 ion with 18 neutrons and 18 electrons	Mass number of an ion with 15 protons, 18 electrons, and 16 neutrons	Number of electrons in a neutral atom with atomic number 25	Mass number of <sup>33</sup> <sub>16</sub> S
Set 12	Set 12	Set 12	Set 12



Number of protons in a neutral atom with 75 neutrons and 54 electrons	Mass number of an atom with 64 protons, 64 electrons, and 92 neutrons	Atomic number of erbium	Number of neutrons in <sup>203</sup> Tl
Set 13	Set 13	Set 13	Set 13
Atomic number of a +1 ion having 54 electrons	Number of neutrons in <sup>178</sup> Hf	Number of electrons in a neutral atom with atomic number 59	Number of electrons for Fr <sup>+</sup>
Set 13	Set 13	Set 13	Set 13
Number of protons in a neutral atom with 120 neutrons and 80 electrons	Number of protons in an element with atomic number 77	Number of electrons in a neutral gold atom	Number of neutrons in <sup>137</sup> Ba <sup>2+</sup>
Set 13	Set 13	Set 13	Set 13
Mass number of a –1 ion with 54 electrons and 74 neutrons	Number of electrons in a Pb <sup>4+</sup> ion	Mass number of <sup>130</sup> <sub>54</sub> Xe	Mass number of a neutral atom with 87 neutrons and 62 electrons
Set 13	Set 13	Set 13	Set 13
Atomic number of <sup>183</sup> <sub>74</sub> W	Number of electrons in a neutral gadolinium atom	Mass number of an ion with 80 protons, 78 electrons, and 120 neutrons	Number of neutrons in <sup>193</sup> <sub>77</sub> Ir
Set 13	Set 13	Set 13	Set 13



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Number of neutrons in <sup>73</sup> <sub>32</sub> Ge	Number of electrons in a neutral bismuth atom	Number of protons in a neutral atom with 70 neutrons and	Mass number of a neutral atom with 120 neutrons and
		51 electrons	80 electrons
Set 14	Set 14	Set 14	Set 14
Atomic number of silicon	Number of electrons in a neutral cadmium atom	Number of neutrons in a <sup>88</sup> Sr <sup>2+</sup> ion	Number of neutrons in <sup>59</sup> Co
Set 14	Set 14	Set 14	Set 14
Number of electrons in a O <sup>2–</sup> ion	Mass number of a +4 ion with 109 neutrons and 70 electrons	Number of protons in <sup>31</sup> P <sup>3–</sup>	Number of protons in a <sup>44</sup> Ca <sup>2+</sup> ion
Set 14	Set 14	Set 14	Set 14
Number of protons in an element with atomic number 46	Number of electrons for S <sup>2–</sup>	Atomic number of <sup>99</sup> <sub>44</sub> Ru	Number of electrons in a neutral atom with atomic number 39
Set 14	Set 14	Set 14	Set 14
Atomic number of a –1 ion having 36 electrons	Mass number of <sup>93</sup> <sub>41</sub> Nb	Mass number of an atom with 36 protons, 36 electrons, and 46 neutrons	Mass number of an ion with 29 protons, 27 electrons, and 34 neutrons
Set 14	Set 14	Set 14	Set 14



Number of electrons in a neutral tellurium atom	Mass number of a –2 ion with 9 neutrons and 10 electrons	Number of electrons for P <sup>3–</sup>	Number of electrons in a neutral ytterbium atom
Set 15	Set 15	Set 15	Set 15
Number of neutrons in <sup>58</sup> Fe	Atomic number of mercury	Number of electrons in a neutral atom with atomic number 40	Number of protons in a <sup>122</sup> Sn <sup>2+</sup> ion
Set 15	Set 15	Set 15	Set 15
Number of electrons in a N <sup>3–</sup> ion	Atomic number of a -2 ion having 58 electrons	Number of neutrons in <sup>87</sup> <sub>38</sub> Sr	Atomic number of <sup>78</sup> <sub>34</sub> Se ion
Set 15	Set 15	Set 15	Set 15
Mass number of a neutral atom with 98 neutrons and 67 electrons	Number of protons in an element with atomic number 46	Number of protons in <sup>32</sup> S <sup>2–</sup>	Mass number of an ion with 28 protons, 26 electrons, and 32 neutrons
Set 15	Set 15	Set 15	Set 15
Number of neutrons in a <sup>44</sup> Ca <sup>2+</sup> ion	Mass number of an atom with 42 electrons, 42 protons, and 55 neutrons	Mass number of <sup>48</sup> <sub>22</sub> Ti	Number of protons in a neutral atom with 72 neutrons and 51 electrons
Set 15	Set 15	Set 15	Set 15

