## Challenge

### Atomic Theory Magic Square

Put the number of the definition from the list below on the line in the square with the appropriate term. Check your answers by adding the numbers in each row and column. They should add up to the same number.

<table>
<thead>
<tr>
<th>Democritus</th>
<th>Dalton</th>
<th>Thomson</th>
<th>element</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rutherford</td>
<td>proton</td>
<td>atom</td>
<td>Bohr</td>
<td>total</td>
</tr>
<tr>
<td>quark</td>
<td>neutron</td>
<td>nucleus</td>
<td>alpha particle</td>
<td>total</td>
</tr>
<tr>
<td>electron</td>
<td>Chadwick</td>
<td>energy levels</td>
<td>electron cloud</td>
<td>total</td>
</tr>
<tr>
<td>total</td>
<td>total</td>
<td>total</td>
<td>total</td>
<td></td>
</tr>
</tbody>
</table>

1. current explanation of where electrons might be found in the atom
2. English schoolteacher who proposed the atomic theory model of matter
3. proposed the plum-pudding model of the atom; discovered the electron
4. the negative particle that circles the nucleus
5. developed the model of the atom in which electrons orbit the nucleus in energy levels
6. the neutral particle in the nucleus of an atom
7. the tiny positive core of an atom; contains protons and neutrons
8. discovered the nucleus using his gold foil experiment
9. small particles that make up protons and neutrons
10. the smallest particle of an element that has the properties of that element
11. the positive particle in the nucleus of an atom
12. used by Rutherford in his experiment; made of two protons and two neutrons
13. Greek philosopher who made a mental model of the atom
14. the paths in which electrons circle the nucleus according to the Bohr model
15. discovered the neutron
16. building blocks of matter represented by a symbol