Atomic Addition!

Learning Goals:

- Identify additive inverses (zero pairs).
- Model addition of integers using protons and electrons, and extend this to a number line.
- Create a rule for adding integers.

1. **Explore** the Build an Atom simulation for a few minutes, building whatever atoms you choose. Write down 1-3 observations you have about building an atom.

2. Build two different atoms with a **positive net charge**, then record some information about your atoms in the tables and diagrams below.

<table>
<thead>
<tr>
<th>Protons</th>
<th>Electrons</th>
<th>Neutrons</th>
<th>Net Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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   ![Net Charge](image)

   Compare your results with your partner.

3. Build two different atoms with a **negative net charge**, then record some information about your atoms in the tables and diagrams below.

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   ![Net Charge](image)

   Compare your results with your partner.
6. Discuss with a partner and record your thoughts:
   a) In order to have a **positive** net charge, what must be true about the number of protons and electrons?
   b) In order to have a **negative** net charge, what must be true about the number of protons and electrons?
   c) What could the value of a **neutron** be, if represented by an integer?
   d) Why are some of the + and – signs circled in the net charge?

11. Create an atom with a **net charge of zero**. What do you notice about the number of protons and electrons?

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12. The net charge of the Nitrogen atom below can be written as the addition sentence $7 + (-5) = 2$

Re-write the net charge of the atoms you created above as addition sentences.