Chemistry CP

Name:

Jigsaw with Expert Groups: Development of Atomic Theory

Section:

The purpose of this activity is to learn about key historical contributions to the development of atomic theory. Students will work in expert groups to learn about one key scientist, and then teach about that scientist's main ideas to the other students in their base groups. At the end of class, you should be able to -----

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Base Group: _____ _____

_____ _____

Read this!
Need something meaningful here

Split up into expert groups:
Expert Group: _____ _____

_____ _____

Have one person from your group get iPads for each group member.

As a group, use the links provided to learn important facts about your scientists and research answers to the key questions. Keep your answers brief and to the point! When you are done, return to your base groups. Base group members will take turns teaching about each scientist. Then, group members will work together to complete the application question.

Expert Group 1: Democritus
Links:

- https://the-history-of-the-atom.wikispaces.com/Democritus
- http://www-groups.dcs.st-and.ac.uk/history/Biographies/Democritus.html
- http://www.particleadventure.org/other/history/
- http://northspringer.tripod.com/HistoryofAtom/
- http://www-history.mcs.st-and.ac.uk/history/Biographies/Democritus.html

Key Questions

1. Where did Democritus live?

2. List two relevant facts about Democritus

3. His main contribution to atomic theory

4. Origin of the word atom

5. Other interests besides chemistry

6. Interesting but weird facts about Democritus

Expert Group 2: Lavoisier
Links

- http://scienceworld.wolfram.com/biography/Lavoisier.html
- http://mattson.creighton.edu/History_Gas_Chemistry/Lavoisier.html
- http://www.historylearningsite.co.uk/antoine_lavoisier.htm

Key Questions

1. Where did Lavoisier live?

2. List two relevant facts about Lavoisier

3. What is the famous law attributed to Lavoisier?

4. Explain this law in your own words.

5. Why is Lavoisier called the “father of modern chemistry?”

6. Weird but true facts about Lavoisier

7. Lavoisier's other research interests

Expert Group 3: Proust

Links

- https://www.britannica.com/biography/Joseph-Louis-Proust
- http://www.chemteam.info/AtomicStructure/LawofDefiniteProportion.html
- http://web.lemoyne.edu/~giunta/proust.html
- http://historyoftheatomictheory.weebly.com/joseph-proust.html
- http://chemed.chem.purdue.edu/genchem/history/proust.html
- http://www.3rd1000.com/history/atoms.htm

Key Questions

1. Where did Proust live?

2. List two relevant facts about Proust

3. What important law is credited to Proust?

4. Describe this law in your own words. Include examples.

5. Was this law initially accepted or challenged? How was it eventually settled?

6. Weird but true facts about Proust

Expert Group 4 Dalton

- http://www-donut.fnal.gov/web_pages/standardmodelpg/TheStandardModel.html
- http://www.3rd1000.com/history/atoms.htm
- http://northspringer.tripod.com/HistoryofAtom/id1.html
- https://www.chemheritage.org/historical-profile/john-dalton

Key Questions

1. Where did Dalton live?

2. List two relevant facts about Dalton.

3. What was Dalton's most important contribution to chemistry?

4. Weird but true facts about Dalton

5. Dalton's other research interests

Application Question

Match the scientist with their contribution(s)

1. Dalton	A. Law of conservation of mass
2. Lavoisier	B. Law of definite proportions
3. Democritus	C. Proposed first atomic theory
4. Proust	D. Credited with idea that matter is made up of atoms

Cooperative learning strategies keep students engaged throughout the entire learning activity. This lesson uses the “jigsaw with expert groups” structure. Each “expert” group will study one type of chemical bond and then teach about this bond type to other students. In this way, students are held accountable for the success of the activity, both individually and as groups. The activity concludes with a formative assessment, where students work as a group to predict bond types and their properties of substances, based on the formulas of the substances.

To complete this activity, each individual student needs a copy of the handout. Additionally, groups of students will need access to internet resources to research the four types of bonding and answer the key questions. Ideally, each expert group will be able to use more than one computer or wireless tablet to efficiently read the links for each bond type.

As a follow up activity, students could examine different molecular models and determine which ones involve sharing or transfer of electrons. Students could carry out solubility, conductivity and melting point tests of an unknown sample to identify the unknown from a list of possibilities.