

Overarching Question: How did our knowledge about the atom develop over time?

Standard: PS.3 The student will investigate and understand the modern and historical models of atomic structure. Key concepts include

- a) the contributions of Dalton, Thomson, Rutherford, and Bohr in understanding the atom; and
- b) the modern model of atomic structure.

Content Objective: What content do they need to know?

Students must describe how the model of the atom changed from Dalton to Schrodinger, in chronological order.

Language Objectives: What academic language functions will they need?

In groups, students will read articles and watch videos about an assigned scientist. They will discuss the articles/videos, and summarize the contributions/experiments of the scientist in writing, using cause/effect vocabulary. They will verbally explain these contributions to their classmates. They will write the contributions of other scientists as it is verbally explained to them. Lastly, they will put their summarized information in chronological order.

Link: How will you build background knowledge?

Students will complete a warm-up, which asks them to label the parts of an atom using a diagram. They will use information they learned about the atom from the previous week's lesson.

Engage/Explain: How will you communicate new knowledge and model for students?

Teacher explains jigsaw activity to students. Students will be broken into 5 groups. Each student in the group will be given a different scientist to learn about (Dalton, Thomson, Rutherford, Bohr, Heisenberg/Schrodinger). The teacher will explain this structure, then model it using color blocks. Once they find out which scientist they are studying, they will get into new groups based on their assigned scientist. Each scientist group will use different texts to learn important facts about their scientist. Once they are finished, they will go back to their original group, and teach the group about their scientist.

When reading, students must look for this important information:

- When was your scientist born?
- When did he make his model/theory of the atom?
- Did he do an experiment to come up with this model? If so, tell the name and a brief explanation.
- What are the parts of his atom?
- What was the name of his model?
- Draw and label a model of his atom.

		Teacher will model looking for this information and how to use the sentence frames in the graphic organizer (below) by doing a think aloud using an article about the atomic scientist James Chadwick.	
Active Learning: How will you differentiate learning and provide students opportunities to interact with the material?			
Students will use different leveled texts, the support of their groups, and teacher-verified videos to find the information about their scientists. The students will write their information on a graphic organizer (below), which includes sentence frames. After their information has been verified by their group members and teacher, students return to their home groups to teach about their scientists. While students are listening to their student teacher, they must fill in important information about each scientist on their graphic organizer.			
Reflect: Students complete the Atoms/Scientists word sort using the information from their graphic organizer. Students must match the picture and information to the scientist, and put it in chronological order on the timeline.		Now & Then: Next, students will learn how to use the current model of the atom to build atoms from the periodic table.	
How will you incorporate each of the 4 language domains into your lesson?			
Writing Students will summarize articles, videos, and group discussion to fill out their graphic organizers.	Reading Students will read leveled texts about their scientist in their groups.	Speaking In their scientist groups, students will have to paraphrase their group mates’ thoughts, and explain the outcomes/impacts of their scientists’ experiments.	Listening In their scientist groups, students will listen to information from their group mates and teacher-verified informational videos to gather information for their graphic organizer.
How will you observe and measure students learning? Formative/Summative Assessments The Atoms/Scientists word sort will be used as a formative assessment.			

Atomic Scientists – Notes Page

Scientist	Contributions	Model of Atom
Dalton	The scientist I studied is _____. He was born in _____. He developed his theory of the atom in _____. His theory was that _____ _____ _____ _____. He (did/did not) do an experiment to come up with his theory. The experiment was called _____. In the experiment, he _____. His results were _____. _____. This showed that _____. _____ His atom model was called _____. It has _____ part(s). They are called _____, _____, and _____. <u>Other interesting/important information:</u> _____	

Th om so n

The scientist I studied is _____. He was born in _____.

He developed his theory of the atom in _____. His theory was that

He (did/did not) do an experiment to come up with his theory. The experiment was called

_____. In the experiment, he

_____.

His results were

This showed that _____.

His atom model was called _____. It has _____ part(s). They are called _____, _____, and _____.

Other interesting/important information:

Rutherford

The scientist I studied is _____. He was born in _____.

He developed his theory of the atom in _____. His theory was that

_____.

He (did/did not) do an experiment to come up with his theory. The experiment was called

_____. In the experiment, he

_____. His results were

_____.

This showed that _____.

His atom model was called _____. It has _____ part(s). They are called

_____, _____, and _____.

Other interesting/important information:

Bo hr

The scientist I studied is _____. He was born in _____.

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His atom model was called _____. It has _____ part(s). They are called

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Other interesting/important information:

Schro dinge r and Heise nberg

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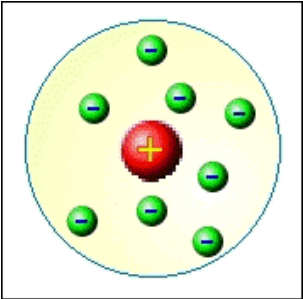
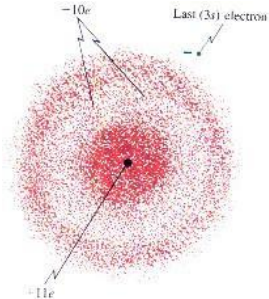
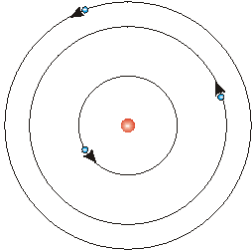
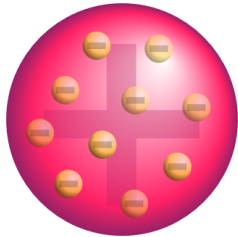
This showed that _____.

His atom model was called _____. It has _____ part(s). They are called

_____, _____, and _____.

Other interesting/important information:

Atoms/Scientists Word Sort

				
J.J. Thomson	orbits are called energy levels	electrons move around nucleus in fixed orbits	positive particles in nucleus negative particles outside	Niels Bohr
first to suggest that atoms contain smaller particles	location of electrons can't be known	John Dalton	atoms can't be divided or destroyed	discovered electrons

atoms are mostly empty space	Electron Cloud Schrodinger	nucleus contains protons and neutrons	Ernest Rutherford	all elements are made of atoms
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