The Nature of Matter: Unit Overview

SNC1W, Grade 9 Science (De-streamed), Unit 3. 15 classes of 75 minutes, plus a unit test (about three and a half weeks).

The big question

What is everything made of, and how do the elements and compounds we use affect people and the planet?

Students classify matter, measure density, look for evidence of chemical change with household materials, trace how evidence changed models of the atom, draw Bohr-Rutherford diagrams, and discover the patterns of the periodic table by testing elements and coding a data set of the first 20 elements. They build molecule models, test household products, model ocean acidification, follow an aluminum can from bauxite to recycling, explore new chemistry in the skilled trades and meet chemists from many communities. The unit ends with a Product Life Cycle Assessment and redesign pitch. All data sets are original, and every lab uses cheap, household-safe materials.

Lessons

#	Lesson	Classes	Question	Expectations	What's inside
1	**Sorting Matter**	1	What is matter made of?	C2.6, C2.1	Particle theory; elements, compounds, mixtures; matter sort
2	**Density Lab**	1	How much matter fits in a space?	C2.6, A1.2	Density column; displacement; worked density problems
3	**Physical or Chemical Change?**	1	How do we know a new substance formed?	C2.6, C2.1, A1.5	Six household stations; evidence
4	**Models of the Atom**	1	How did evidence change the model?	C2.2, A1.1	Mystery boxes; Democritus to Chadwick; gold foil
5	**Inside the Atom**	1	What's inside an atom?	C2.3, C2.4	Protons, neutrons, electrons; Bohr-Rutherford diagrams
6	**The Periodic Table**	1	Why is the table shaped this way?	C2.4, C2.5	Alien elements; Mendeleev; periods and groups
7	**Patterns in the Table**	1	What patterns do elements show?	C2.5, A1.4, A1.5	Element tests; Python element data
8	**Element Families**	1	Why do families behave alike?	C2.4, C2.5	Alkali metals, halogens, noble gases; reactivity
9	**Compounds and Formulas**	1	What does a formula tell us?	C2.7, C2.4	Counting atoms; ionic vs molecular; molecule models

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10	**Chemistry Under the Sink**	1	How do we use household chemicals safely?	C2.6, A1.5	Cabbage indicator; conductivity; labels
11	**Matter in Ecosystems**	1	How does chemistry change ecosystems?	C2.1, C2.6	Breath test; eggshells; road salt data; Sudbury
12	**Life Cycle of a Product**	1	What is a product's life story?	C1.1, A2.4	Aluminum can; impact table; summative launch
13	**Emerging Chemical Technologies**	1	How is new chemistry changing the trades?	C1.2, A2.2	Tech jigsaw; factors; AI and careers
14	**Chemists Who Changed the World**	1	Who shapes chemistry?	A2.5, C1.2	Indigenous knowledge; chemist profiles; gallery walk
15	**Summative Workshop**	1	How do we build a strong assessment?	C1.1, C2.6	Rubric; model; research checklist; pitch rehearsal

Assessment

Type	In this unit
Assessment for learning	Handout tasks and exit tickets in every lesson (labs, diagrams, data analysis, profiles)
Assessment as learning	Self-checks, research checklist and peer feedback on pitches
Assessment of learning	Product Life Cycle Assessment and redesign pitch (suggested weight 7%) and the Unit Test (suggested weight 5%)

What's included

In the Start Here folder:

- **Summative Task and Rubric:** Product Life Cycle Assessment and redesign pitch
- **Unit Test and Answer Key:** a 45-minute, 36-mark test with full answers and mark breakdowns

Safety: every hands-on activity has safety notes in its plan and slides. Labs use household-safe materials only; there are no flame tests, and reactive metals are shown by video only. Coding uses free Python (python.org) or a board-approved browser editor.

What's in each lesson

- Teacher lesson plan with expectations, timed sequence, differentiation, look-fors and answer guides
- Slides with speaker notes
- Student handouts and organizers
- Editable Word and PowerPoint files, plus PDFs

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