Climate Change: Unit Overview

SNC2D, Grade 10 Science (Academic), Unit 4. 15 classes of 75 minutes, plus a summative work period and one class for the unit test (17 classes, about three and a half weeks).

The big question

How does Earth's climate system work, how are human activities changing it, and which responses are making a difference?

Students investigate the climate system with cheap, safe labs (convection, albedo, density and a greenhouse model), trace greenhouse gases, ozone and smog, read proxy data, test a hypothesis with original time-trend data, separate natural and human causes, classify their region, analyse effects around the world (including Inuit-led responses), compare media perspectives and assess real initiatives. Data sets and articles are original; real figures are sourced in the teacher notes.

Lessons

#	Lesson	Classes	Question	Expectations	What's inside
1	**Weather, Climate and the Climate System**	1	How does the climate system work?	D3.1, D2.1	Climate system; word bank; two towns
2	**Heat Transfer in Air and Water**	1	How does heat move in air and water?	D3.2, D2.5	Convection lab; sea breeze
3	**Water, Ice and Albedo**	1	How do water and ice shape climate?	D2.6, A1.5	Lamp lab; ice-albedo feedback
4	**Ocean Currents**	1	How do currents move heat?	D2.7, D3.2	Density model; ocean conveyor
5	**Model the Greenhouse Effect**	1	How does the greenhouse effect work?	D2.2, D3.3, A1.1	Jar model and its limits
6	**Greenhouse Gases: Sources and Sinks**	1	Where do greenhouse gases come from and go?	D3.5, D3.6	Sources, sinks; CO_2e
7	**Ozone and Smog**	1	Why is ozone good up high and bad nearby?	D3.7	Montreal Protocol; smog data
8	**Reading the Past: Ice Cores and Tree Rings**	1	How do we know past climates?	D2.3	Tree-ring and ice-core data
9	**Testing a Climate Hypothesis**	1	Does the evidence support the hypothesis?	D2.4, A1.8, A1.12	Time trend; Python (optional)

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10	**Natural and Human Causes**	1	What is changing the climate?	D3.4	Timescales; Canada's emissions
11	**Indicators of Climate Change**	1	What does the evidence show?	D3.8	Indicator stations; rates
12	**Our Climate Region**	1	What kind of climate do we live in?	D2.8	Ecoregions; Köppen; comparisons
13	**Effects Around the World**	1	Who and what is affected?	D1.1	Effects gallery; Inuit-led responses
14	**Climate in the Media**	1	Which sources can we trust?	D2.9, A1.9	Five texts; bias; fix the message
15	**Climate Initiatives**	1	Which initiatives work?	D1.2, A2.1, A2.2	Scorecard; careers; summative

Assessment

Type	In this unit
Assessment for learning	Lab sheets, data analyses, organizers, quick checks and exit tickets
Assessment as learning	Self-checks against success criteria; model evaluations and peer discussion
Assessment of learning	Climate Initiative Assessment and Action Proposal with rubric (suggested weight 7% of the final mark) and Unit Test with answer key (suggested weight 5%)

What's included

In the Start Here folder:

- **Summative Task and Rubric:** Climate Initiative Assessment and Action Proposal, with rubric and checklist
- **Unit Test and Answer Key:** about 45 minutes, 38 marks, with full worked answers

Safety: every hands-on activity has safety notes (lamps, warm tap water only, plastic containers, food colouring). Initiative details such as ENERGY STAR and retrofit rebates can change; check their status before teaching.

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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