

Earth Sciences Resource List

TROP ICSU
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Lesson Plans

#	Lesson Plan Title	Disciplines	Key Topics	Link
1	Lesson Plan: Carbon Cycle Regulation by Carbon Sequestration	Environmental Sciences, Chemistry, Earth Sciences	Carbon Cycle, Carbon Sequestration	https://tropicsu.org/carbon-cycle-regulation-by-carbon-sequestration/
2	Hip-Hop in the Classroom: Teaching Climate Change through Rap	Humanities, Social Sciences, Earth Sciences, Environmental Sciences	Climate Change, Global Warming, Hip-Hop, Hip-Hop Education, Rap, Climate Change Overview, Cultural Studies, Music, Sociology, Earth's Climate	https://tropicsu.org/hip-hop-in-the-classroom-teaching-climate-change-through-rap/
3	Lesson Plan: Teach the Earth's Climate System Through Simulations (Earth-Like)	Earth Sciences, Environmental Sciences, Geography	Climate Change Overview, Planetary Climate, Earth's Climate System, Earth's Climate, Earth's Layers, Atmosphere, Biosphere, Hydrosphere, Lithosphere, Cryosphere	https://tropicsu.org/teach-the-earths-climate-system-through-simulations-earth-like/
4	Lesson Plan: Coding with Python: Modeling the Ice Albedo Feedback	Mathematics and Statistics, Earth Sciences	Mathematical Modeling, Computer Programming, Cryosphere, Earth's Climate, Milankovitch Cycles	https://tropicsu.org/coding-with-python-modeling-the-ice-albedo-feedback/
5	Lesson Plan: The Water Cycle in a Sustainable World	Chemistry, Geography, Earth Sciences	Environmental Chemistry, Water Cycle, Biogeochemical Cycles, Hydrosphere, Atmosphere, Water Resources and Climate Change, Hydrological Cycle, Condensation, Evaporation	https://tropicsu.org/the-water-cycle-in-a-sustainable-world/
6	Lesson Plan: Waves and Oscillations	Earth Sciences, Physics	Atmospheric Physics, Atmosphere, Waves, Oscillations, Simple Harmonic Motion	https://tropicsu.org/waves-and-oscillations-2/
7	Lesson Plan: Teach the Earth's Climate System Through Simulations (Build Your Own Earth)	Earth Sciences, Environmental Sciences, Geography	Climate Change Overview, Earth's Climate, Planetary Climate, Earth's Climate System, Earth's Layers, Atmosphere, Biosphere, Hydrosphere, Lithosphere, Cryosphere	https://tropicsu.org/teach-the-earths-climate-system-through-simulations-build-your-own-earth/

#	Lesson Plan Title	Disciplines	Key Topics	Link
8	Lesson Plan: Major Landforms: Mountains and Climate	Earth Sciences, Geography	Earth's Layers, Earth's Climate, Lithosphere	https://tropicsu.org/major-landforms-mountains-and-climate/
9	Lesson Plan: Major River Systems: Climate Change and the River Nile	Geography, Earth Sciences, Environmental Sciences	Climate Change Overview, Recent Climate Change, Hydrosphere, Earth's Layers, Food Security, Agriculture, Disasters and Hazards, Climate Change and Food, Water Resources and Climate Change, El Nino Southern Oscillation	https://tropicsu.org/major-river-systems-climate-change-and-the-river-nile/
10	Himalayan Glaciers Climate Change in Bhutan	Geography, Earth Sciences, Environmental Sciences	Glaciers, Earth's Layers, Cryosphere, Lithosphere, Hydrosphere, Disasters and Hazards, Water Resources and Climate Change, Water Security	https://tropicsu.org/himalayan-glaciers-climate-change-in-bhutan/
11	Lesson Plan: Permafrost and Climate Change	Geography, Environmental Sciences, Earth Sciences	Cryosphere, Glaciers, Greenhouse Effect, Disasters and Hazards, Carbon Emissions	https://tropicsu.org/permafrost-and-climate-change/
12	Lesson Plan: Phase Diagrams and Phase Equilibria	Earth Sciences, Chemistry, Physics	Phase Diagrams, Water Cycle, Biogeochemical Cycles, Greenhouse Gases, Hydrosphere, Atmosphere, Atmospheric Physics, Greenhouse Effect	https://tropicsu.org/phase-diagrams-and-phase-equilibria/
13	Lesson Plan: Heat Transport in the Atmosphere, Hadley Circulation and Climate (Global Precipitation Patterns and Distribution of Deserts)	Geography, Earth Sciences, Physics	Hadley Circulation, Heat Transport, Atmospheric Physics, Atmosphere, Convection	https://tropicsu.org/heat-transport-in-the-atmosphere-hadley-circulation-and-climate-global-precipitation-patterns-and-distribution-of-deserts/

#	Lesson Plan Title	Disciplines	Key Topics	Link
14	Lesson Plan: Teaching about Hazards and Disasters through Climate-related Examples (Sea-Level Rise and Flooding due to Melting of Polar Ice)	Geography, Earth Sciences, Environmental Sciences	Earth's Layers, Cryosphere, Hydrosphere, Disasters and Hazards, Sea Level Rise, Glaciers, Environmental Migration	https://tropicsu.org/teaching-about-hazards-and-disasters-through-climate-related-examples-sea-level-rise-and-flooding-due-to-melting-of-polar-ice/
15	Lesson Plan: Analyzing Trends and Calculating Uncertainty using Hurricane Data Records	Mathematics and Statistics, Geography, Earth Sciences	Confidence Interval, Standard Deviation, Trend Analysis, Disasters and Hazards, Hydrosphere, Atmosphere, Recent Climate Change	https://tropicsu.org/analyzing-trends-and-calculating-uncertainty-using-hurricane-data-records-2/
16	Lesson Plan: Coriolis Force, Coriolis Effect, and the Impact of Coriolis Effect on Climate	Physics, Earth Sciences	Atmospheric Physics, Atmosphere, Hydrosphere, Coriolis Force, Coriolis Effect	https://tropicsu.org/coriolis-force-coriolis-effect-and-the-impact-of-coriolis-effect-on-climate/
17	Teaching Glaciology, Glaciers and Glacial Retreat, and the Cryosphere Climate Relationship	Geography, Earth Sciences	Glaciers, Cryosphere, Earth's Layers	https://tropicsu.org/teaching-glaciology-glaciers-and-glacial-retreat-and-the-cryosphereclimate-relationship/
18	Lesson Plan: Atomic Number, Mass Number, Isotopes and Isotopic Ratios, and Isotopic Compositions as Climate Proxies	Earth Sciences, Chemistry	Atomic Number, Atomic Mass, Environmental Chemistry, Isotopes, Earth's Climate, Climate History, Recent Climate Change, Milankovitch Cycles, Cryosphere	https://tropicsu.org/atomic-number-mass-number-isotopes-and-isotopic-ratios-and-isotopiccompositions-as-climate-proxies/
19	Simple Harmonic Motion and Simple Harmonic Oscillators	Physics, Earth Sciences	Atmospheric Physics, Simple Harmonic Motion (SHM)	https://tropicsu.org/simple-harmonic-motion-and-simple-harmonic-oscillators/

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20	The Greenhouse Effect	Earth Sciences, Geography, Environmental Sciences, Chemistry	Climate Change Overview, Greenhouse Effect, Greenhouse Gases, Fossil Fuels, Atmosphere	https://tropicsu.org/the-greenhouse-effect-lp/
21	Create Your Climate Model- Earth's Energy Balance using Python	Mathematics and Statistics, Earth Sciences, Physics	Mathematical Modelling, Computer Programming, Earth's Climate, Planetary Climate, Planetary Energy Balance, Stefan Boltzmann Law, Thermodynamics, Blackbody Radiation	https://tropicsu.org/create-your-climate-model-earths-energy-balance-using-python/
22	Teaching "Climate Change and Food Security" and "Climate Change and Agriculture"	Social Sciences, Environmental Sciences, Earth Sciences	Food Security, Agriculture, Climate Change and Food	https://tropicsu.org/teaching-climate-change-and-food-security-and-climate-change-and-agriculture/
23	Data Science: Predictive Analysis using Mumbai Temperature Data	Mathematics and Statistics, Earth Sciences	Introduction to Statistics, Data Science, Trend Analysis, Computer Programming, Recent Climate Change	https://tropicsu.org/data-science-predictive-analysis-using-mumbai-temperature-data/
24	Teaching the Carbon Cycle through Climate-related Examples	Chemistry, Earth Sciences, Environmental Sciences, Geography	Environmental Chemistry, Carbon Cycle, Biogeochemical Cycles, Chemical Weathering, The Urey Reaction, Atmosphere, Lithosphere, Biosphere, The Silicate Thermostat, Carbon Emissions, Fossil Fuels, Earth's Climate System	https://tropicsu.org/teaching-the-carbon-cycle-through-climate-related-examples/
25	Carbon Sequestration in Trees	Environmental Sciences, Biological Sciences, Earth Sciences, Chemistry	Carbon Sequestration, Carbon Cycle, Biogeochemical Cycles, Ecology, Botany, Biosphere	https://tropicsu.org/carbon-sequestration-in-trees/

Teaching Tools

#	Teaching Tool Title	Disciplines	Key Topics	Link
1	Reading: A History of Climate Models	Physics, Earth Sciences	Climate Physics, Climate Models, Heat Transport, Radiation, Chaos Theory	https://tropicsu.org/a-history-of-climate-models-2/
2	Video: An Introduction to Atmospheric Thermodynamics	Physics, Earth Sciences	Thermodynamics, Atmospheric Physics, Climate Physics	https://tropicsu.org/an-introduction-to-atmospheric-thermodynamics/
3	Video: Quantum Physics	Physics, Earth Sciences	Quantum Physics, Electromagnetic Radiation, The Greenhouse Effect	https://tropicsu.org/quantum-physics-2/
4	Video: Quantum Mechanics and Climate Change	Physics, Earth Sciences	Quantum Mechanics, Quantum Physics, Planck's Law	https://tropicsu.org/quantum-mechanics-and-climate-change/
5	Reading: Chaos Theory and Global Warming	Physics, Earth Sciences	Chaos Theory, Climate Models, Atmospheric Physics	https://tropicsu.org/chaos-theory-and-global-warming/
6	Classroom/Laboratory Activity: The Coriolis Effect	Physics, Earth Sciences	Coriolis Force, Coriolis Effect, Atmosphere	https://tropicsu.org/the-coriolis-effect/
7	Videos: Earth's Climate, the Biosphere, and Geological Evolution	Biological Sciences, Earth Sciences	Climate Change Overview, Earth's Climate, Biosphere, Lithosphere	https://tropicsu.org/earths-climate-the-biosphere-and-geological-evolution/
8	Reading: What is the Atmosphere?	Earth Sciences, Geography, Environmental Sciences	Climate Change Overview, Atmosphere	https://tropicsu.org/what-is-the-atmosphere-2/

#	Teaching Tool Title	Disciplines	Key Topics	Link
9	Reading: What is the Biosphere?	Earth Sciences, Biological Sciences	Climate Change Overview, Biosphere	https://tropicsu.org/what-is-the-biosphere/
10	Reading: What is the Cryosphere?	Earth Sciences, Geography	Climate Change Overview, Cryosphere	https://tropicsu.org/what-is-the-cryosphere/
11	Reading: What is the Lithosphere?	Earth Sciences, Geography	Climate Change Overview, Lithosphere	https://tropicsu.org/what-is-the-lithosphere/
12	Reading: What is the Hydrosphere?	Earth Sciences, Geography	Climate Change Overview, Hydrosphere	https://tropicsu.org/what-is-the-hydrosphere/
13	Reading: Climate and the Hydrosphere	Earth Sciences, Geography	Climate Change Overview, Hydrosphere	https://tropicsu.org/climate-and-the-hydrosphere/
14	Reading: Climate Change and Natural Disasters	Earth Sciences, Environmental Sciences, Geography	Disasters and Hazards, Climate Change Overview	https://tropicsu.org/climate-change-and-natural-disasters/

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15	Reading: Climate Disasters: An Overview	Earth Sciences, Environmental Sciences, Geography	Climate Change Overview, Disasters and Hazards	https://tropicsu.org/climate-disasters-an-overview/
16	Teaching Module: Climate and the Biosphere: An Overview	Earth Sciences, Environmental Sciences, Biological Sciences	Climate Change Overview, Biosphere	https://tropicsu.org/climate-and-the-biosphere-an-overview/
17	Reading: Can People Change Climate?	Earth Sciences, Environmental Sciences, Biological Sciences	Climate Change Overview	https://tropicsu.org/can-people-change-climate/
18	Teaching Module: Climate Adaptation and Mitigation	Earth Sciences, Economics, Environmental Sciences	Climate Change Overview, Earth's Climate, Climate Change Economics, Adaptation and Mitigation, Agriculture, Human Health, Human Migration	https://tropicsu.org/climate-adaptation-and-mitigation/
19	Video: Climate Adaptation: An Introduction	Earth Sciences	Climate Change Overview, Adaptation and Mitigation	https://tropicsu.org/climate-adaptation-an-introduction/
20	Teaching Module: Feedback Mechanisms	Earth Sciences	Earth's Climate, Planetary Climate, Lithosphere, Cryosphere, Feedback Mechanisms	https://tropicsu.org/feedback-mechanisms/
21	Video: Climate Change and the Lithosphere	Earth Sciences, Geography	Climate Change Overview, Lithosphere	https://tropicsu.org/climate-change-and-the-lithosphere/
22	E-Learning Course: Climate Science: An Introduction	Earth Sciences, Environmental Sciences	Climate Change Overview, Earth's Climate, Recent Climate Change, Atmosphere, Biosphere, Cryosphere, Lithosphere, Anthroposphere, Earth's Climate System, Climate History, Climate Physics	https://tropicsu.org/climate-science-a-introduction/

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23	Teaching Module: Earth's Climate and the Cryosphere: An Overview	Earth Sciences, Geography	Climate Change Overview, Cryosphere, Milankovitch Cycles, Glaciers	https://tropicsu.org/earths-climate-and-the-cryosphere-an-overview/
24	Reading: What is the Anthroposphere?	Environmental Sciences, Humanities, Earth Sciences, Social Sciences	Climate Change Overview, Anthropology	https://tropicsu.org/what-is-the-anthroposphere/
25	Video Lecture: First Law of Thermodynamics	Physics, Earth Sciences	Thermodynamics, Atmospheric Physics, Planetary Energy Balance, Earth system, Earth's Climate	https://tropicsu.org/first-law-of-thermodynamics/
26	Video: Clausius Clayperon and the Second Law of Thermodynamics	Physics, Earth Sciences	Climate Physics, Atmospheric Sciences, Atmospheric Physics	https://tropicsu.org/clausius-clayperon-and-the-second-law-of-thermodynamics/
27	Teaching Module: Climate Change Mathematics by NASA	Earth Sciences, Mathematics and Statistics, Environmental Sciences	Introduction to Statistics, Climate Change Overview, Earth's Climate, Algebra, Probability, Trigonometry	https://tropicsu.org/climate-change-mathematics-by-nasa/
28	Video: Thermodynamics and the Hydrostatic Equation	Physics, Earth Sciences	Thermodynamics, Atmospheric Physics	https://tropicsu.org/thermodynamics-and-the-hydrostatic-equation/
29	Reading: Introduction to Planetary Energy Balance	Physics, Earth Sciences	Planetary Energy Balance, The Greenhouse Effect, Electromagnetic Radiation, Stefan Boltzmann Law	https://tropicsu.org/introduction-to-planetary-energy-balance/

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30	Teaching Module: Planetary Energy Balance	Physics, Earth Sciences	Planetary Energy Balance, The Greenhouse Effect, Electromagnetic Radiation, Stefan Boltzmann Law	https://tropicsu.org/planetary-energy-balance-3/
31	Video: Radiative Transfer	Physics, Earth Sciences	Planetary Energy Balance, The Greenhouse Effect, Electromagnetic Radiation, Stefan Boltzmann Law	https://tropicsu.org/radiative-transfer/
32	Model/Simulator: Modeling Planetary Energy Balance	Earth Sciences; Physics; Computer Science	Planetary Energy Balance, The Greenhouse Effect, Climate Models, Stefan Boltzmann Law	https://tropicsu.org/modeling-planetary-energy-balance/
33	Reading: Planetary Temperatures	Physics, Earth Sciences	Planetary Energy Balance, Electromagnetic Radiation, Stefan Boltzmann Law, Planck's Law	https://tropicsu.org/planetary-temperatures/
34	Video: Rising Sea Surface Temperature and Hurricane Intensity	Physics, Earth Sciences	Heat Transport, Atmospheric Physics	https://tropicsu.org/rising-sea-surface-temperature-and-hurricane-intensity/
35	Video: Planck's Law and Earth's Climate	Physics, Earth Sciences	Planck's Law, Atmospheric Physics, Stefan Boltzmann Law, Climate Physics	https://tropicsu.org/plancks-law-and-earths-climate/
36	Reading: Atmospheric Dynamics and Hadley Cells	Physics, Earth Sciences	Hadley Circulation, Heat Transport, Atmospheric Physics	https://tropicsu.org/atmospheric-dynamics-and-hadley-cells/
37	Reading: Hadley Circulation	Geography, Earth Sciences, Physics	Atmosphere, Atmospheric Physics, Hadley Cell, Hadley Circulation, Heat Transport	https://tropicsu.org/hadley-circulation-5/

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38	Model/Simulator: Daisyworld- A Model to Explore the Gaia Hypothesis	Earth Sciences, Mathematics and Statistics, Biological Sciences	Earth's Climate, Planetary Climate, Biosphere, Climate Change Overview, Computer Programming, Mathematical Modelling	https://tropicsu.org/a-model-to-explore-the-gaia-hypothesis/
39	Video: Phase Diagrams and Earth's Climate	Chemistry, Physics, Earth Sciences	Phase Diagram, Water Cycle, Biogeochemical Cycle	https://tropicsu.org/phase-diagrams-and-earths-climate/
40	Reading: Earth's Equable Climate	Physics, Earth Sciences	Climate Physics, Atmospheric Physics, Hadley Circulation, Hadley Cells	https://tropicsu.org/earths-equable-climate/
41	Video: Upwelling	Physics, Earth Sciences, Geography	Coriolis Force, Climate Physics, Atmospheric Physics	https://tropicsu.org/upwelling/
42	Model/Simulator: Modeling Earth's Carbon	Earth Sciences, Mathematic and Statistics	Mathematical Modeling, Numerical Modeling, Earth's Climate, Carbon Cycle, The Geologic Carbon Cycle, Biogeochemical Cycles, Biosphere, Lithosphere, The Silicate Thermostat	https://tropicsu.org/modeling-earths-carbon/
43	Video: Physics of Scattering and Greenhouse Gases	Physics, Earth Sciences	Climate Physics, Atmospheric Physics, Stefan Boltzmann Law	https://tropicsu.org/physics-of-scattering-and-greenhouse-gases/
44	Reading: The Carbon Dioxide Greenhouse Effect	Physics, Earth Sciences	The Greenhouse Effect, Atmospheric Physics, Planetary Climate, Atmosphere	https://tropicsu.org/the-carbon-dioxide-greenhouse-effect/
45	Video: The Greenhouse Effect of the Atmosphere	Physics, Earth Sciences	Blackbody Radiation, Stefan Boltzmann Law, Planetary Climate, Atmosphere	https://tropicsu.org/the-greenhouse-effect-of-the-atmosphere/

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46	Reading: General Circulation Models of Climate	Physics, Earth Sciences	Climate Models, Climate Physics	https://tropicsu.org/general-circulation-models-of-climate/
47	E-Learning Course: Atmospheric Science	Physics, Earth Sciences	Atmospheric Physics, Climate Physics	https://tropicsu.org/atmospheric-science/
48	Model/Simulator: Milankovitch Orbital Parameters	Earth Sciences; Physics; Mathematics and Statistics	Mathematical Modeling, Numerical Modeling, Earth's Climate, Cyrosphere	https://tropicsu.org/milankovitch-orbital-parameters/
49	Reading: Simple Atmospheric Model	Physics, Earth Sciences	Blackbody Radiation, Climate Model, Atmospheric Physics	https://tropicsu.org/simple-atmospheric-model/
50	E-learning Course/Reading: 'The Discovery of Global Warming'	Physics, Earth Sciences, Environmental Sciences, Geography	Climate Change Overview, Greenhouse Effect, Climate Physics, Earth System, Earth's Climate System, Earth's Climate	https://tropicsu.org/the-discovery-of-global-warming/
51	Classroom/Laboratory Activity: Using Isotopes to Measure Temperatures	Chemistry, Earth Sciences	Atomic Number, Atomic Mass, Hydrosphere, Isotopes	https://tropicsu.org/using-isotopes-to-measure-temperatures/
52	Video: Radiation Laws	Physics, Earth Sciences	Blackbody Radiation, Stefan Boltzmann Law	https://tropicsu.org/radiation-laws/

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53	Video: Oceans, Ocean Circulation and Sea Surface Temperatures	Earth Sciences	Thermohaline Circulation, Coriolis Force, Trade Winds	https://tropicsu.org/oceans-ocean-circulation-and-sea-surface-temperatures/
54	A Collection of E-Learning Courses on Climate Change	Earth Sciences, Environmental Sciences	Earth's Climate System, Climate Change Overview, Earth's Climate, Adaptation and Mitigation	https://tropicsu.org/a-collection-of-e-learning-courses-on-climate-change/
55	Visualization: Show Your Stripes: Changes in Temperature	Geography, Earth Sciences, Environmental Sciences	Earth's Climate, Recent Climate Change, Climate History, Atmosphere	https://tropicsu.org/show-your-stripes-changes-in-temperature/
56	Video: Permafrost and Climate Change	Geography, Environmental Sciences, Earth Sciences	Greenhouse Effect	https://tropicsu.org/permafrost-and-climate-change-2/
57	Classroom/Laboratory Activity: Permafrost and Climate Change	Geography, Environmental Sciences, Earth Sciences	Greenhouse Effect, Cryosphere, Glaciers	https://tropicsu.org/permafrost-and-climate-change-3/
58	Video Micro-lecture: Ocean Buffer Chemistry	Chemistry, Environmental Sciences, Earth Sciences	pH Scale, Acids and Bases, Ocean Acidification	https://tropicsu.org/ocean-buffer-chemistry/
59	Reading: Isotopic Compositions and Ice Cores	Chemistry, Earth Sciences	Isotopes, Atomic Number, Atomic Mass, Hydrosphere, Carbon Chemistry	https://tropicsu.org/isotopic-composition-s-and-ice-cores/

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60	Teaching Module: Orbital Forcing and Earth's Climate	Earth Sciences	Isotopes, Milankovitch Cycles, Cryosphere	https://tropicsu.org/orbital-forcing-and-earths-climate/
61	E-learning Course: An Introduction to Climate Change	Earth Sciences, Environmental Sciences	Climate Change Overview, Adaptation and Mitigation	https://tropicsu.org/an-introduction-to-climate-change/
62	Classroom/Laboratory Activity: Reconstruction of Paleoclimate by Using Isotopic Composition Data	Chemistry, Earth Sciences	Atomic Number, Atomic Mass, Isotopes	https://tropicsu.org/reconstruction-of-paleoclimate-by-using-isotopiccomposition-data/
63	Classroom/Laboratory Activity: Climate Change, the Cryosphere, and Rising Sea Levels	Geography, Earth Sciences	Sea Level Rise, Hydrosphere, Cryosphere	https://tropicsu.org/climate-change-the-cryosphere-and-rising-sea-levels/
64	Classroom/Laboratory Activity: Glacial Retreat in Glacier National Park	Geography, Earth Sciences	Glaciers, Cryosphere	https://tropicsu.org/glacial-retreat-in-glacier-national-park/
65	Visualization: Melting Ice Sheets and Sea Level	Geography, Earth Sciences	Sea Level Rise, Hydrosphere	https://tropicsu.org/melting-ice-sheets-and-sea-level/
66	Reading: Glaciers as Indicators of Climate Change	Geography, Earth Sciences	Glaciers, Cryosphere, Earth's Climate	https://tropicsu.org/glaciers-as-indicators-of-climate-change/
67	Reading: Changes in Intensity and Frequency of Hurricanes	Geography, Earth Sciences	Disasters and Hazards, Hydrosphere, Atmosphere	https://tropicsu.org/changes-in-intensity-and-frequency-of-hurricanes/

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68	Reading: Hurricanes and Climate Change	Geography, Earth Sciences	Disasters and Hazards, Hydrosphere, Atmosphere	https://tropicsu.org/hurricanes-and-climate-change/
69	Video: Sea Level Rise	Earth Sciences, Geography, Environmental Sciences	Sea Level Rise, Hydrosphere, Disasters and Hazards	https://tropicsu.org/sea-level-rise/
70	E-learning Course: The Earth's Climate	Earth Sciences	Climate Change Overview, Earth's Climate, Planetary Climate, Recent Climate Change	https://tropicsu.org/the-earths-climate/
71	Reading: A Single-layer Atmosphere Model to Explain Atmospheric Warming	Earth Sciences	Greenhouse Effect, Atmosphere, Planetary Energy Balance, Blackbody Radiation, Stefan-Boltzman Law	https://tropicsu.org/a-single-layer-atmosphere-model-to-explain-atmospheric-warming/
72	Game: NASA Climate Kids	Earth Sciences, Environmental Sciences, Geography	Biodiversity, Greenhouse Effect	https://tropicsu.org/nasas-collection-of-climate-games/
73	Model/Simulator: The Geologic Carbon Cycle and Earth's Climate	Earth Sciences	Carbon Cycle, The Silicate Thermostat, Lithosphere, Biogeochemical Cycles, Geologic Carbon Cycle	https://tropicsu.org/the-geologic-carbon-cycle-and-earths-climate/
74	Teaching Module: The Impact of ENSO and Human Activities on River Hydrology (a case study of the Huanghe River)	Earth Sciences	El Nino Southern Oscillation, Hydrosphere, Water Resources and Climate Change, Recent Climate Change	https://tropicsu.org/the-impact-of-ensu-and-human-activities-on-river-hydrology-a-case-study-of-the-huanghe-river/
75	Visualisation, Model/Simulator, Game: Build Planet Earth	Earth Sciences	Planetary Climate, Earth's Climate, Atmosphere, The Greenhouse Effect, Climate History	https://tropicsu.org/build-planet-earth/

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76	Model/Simulator: Greenhouse Gases and Infrared Radiation	Earth Sciences	Greenhouse Effect, Atmosphere	https://tropicsu.org/greenhouse-gases-and-infrared-radiation/
77	Visualization: Radiation Balance and the Climate of a Planet	Earth Sciences	Planetary Climate, Earth's Climate	https://tropicsu.org/radiation-balance-and-the-climate-of-a-planet/
78	Video: The Earth System and Climate	Earth Sciences	Earth's Climate, Planetary Climate, Recent Climate Change, Earth System	https://tropicsu.org/the-earth-system-and-climate/
79	Carbon Sequestration in Soil	Chemistry, Environmental Sciences, Earth Sciences	Lithosphere, Carbon Cycle, Carbon Sequestration	https://tropicsu.org/carbon-sequestration-in-soil/
80	Climate Solutions for Buildings Sector	Environmental Sciences, Economics, Earth Sciences	Carbon Emissions, Urban Geography, Real Estate	https://tropicsu.org/climate-solutions-for-buildings-sector/
81	The Greenhouse Effect	Chemistry	Greenhouse Effect, Greenhouse Gases (GHGs)	https://tropicsu.org/the-greenhouse-effect-4/
82	Precipitation Patterns and Climate Change	Chemistry, Environmental Sciences	Environmental Chemistry, Water Cycle, Biogeochemical Cycles	https://tropicsu.org/precipitation-patterns-and-climate-change/
83	Climate Solutions for Land Sinks Sector	Environmental Sciences, Economics, Earth Sciences	Agriculture, Biodiversity, Ecosystem, Conservation, Lithosphere, Climate Change and Food, Food Security	https://tropicsu.org/climate-solutions-for-land-sinks-sector/

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84	Climate Change and Human Evolution	Biological Sciences, Earth Sciences, Environmental Studies, Social Sciences	Climate Change Overview, Evolution, Migration, Earth's Climate, Climate History, Anthroposphere, El Nino Southern Oscillation, Environmental Migration, Anthropology, Species and Speciation, Evolution, Natural Selection, Climate History, Archaeology, Anthropology, Sociology	https://tropicsu.org/climate-change-and-human-evolution/
85	The Science and Modeling of Climate Change	Earth Sciences, Environmental Sciences	Climate Change Overview, Earth's Climate, Carbon Cycle, Carbon Emissions	https://tropicsu.org/the-science-and-modeling-of-climate-change/
86	Ancient Civilizations and Climate Change	Earth Sciences, Environmental Studies, Social Sciences	Anthropology, Archaeology, Climate History, Recent Climate Change, Anthroposphere, Cultural Studies, Ancient Civilizations, Earth's Climate	https://tropicsu.org/ancient-civilizations-and-climate-change/
87	Introduction to the Carbon Cycle	Environmental Sciences; Chemistry; Earth Sciences	Carbon Cycle, Biogeochemical Cycles	https://tropicsu.org/introduction-to-the-carbon-cycle/
88	Teachers Guidebook: Oceans and the Cryosphere	Earth Sciences, Environmental Sciences	Climate Change Overview, Adaptation and Mitigation, Hydrosphere, Sea Level Rise, Greenhouse Effect	https://tropicsu.org/teachers-guidebook-oceans-and-the-cryosphere/
89	Climate Solutions for Industry Sector	Environmental Sciences, Economics, Earth Sciences	Carbon Emissions, Adaptation and Mitigation, Climate Change Economics, Economic Growth, Economic Policy, Economic Recovery, Energy	https://tropicsu.org/climate-solutions-for-industry-sector/
90	Hadley Circulation-Heat Transport in the Atmosphere	Physics, Earth Sciences	Convection, Conservation of Energy, Hadley Circulation	https://tropicsu.org/hadley-circulation-heat-transport-in-the-atmosphere/

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91	Food Security	Environmental Science, Geography, Earth Sciences, Social Sciences	Food Security, Climate Change and Food, Agriculture	https://tropicsu.org/food-security-3/
92	Glaciers and Climate Change	Geography, Earth Sciences	Cryosphere, Glaciers, Sea Level Rise, Floods, Shoreline Retreat, Melting of Ice Sheets	https://tropicsu.org/glaciers-and-climate-change/
93	How Yukon glaciers are responding to climate change	Geography, Earth Sciences, Environmental Sciences	Glaciers, Cryosphere	https://tropicsu.org/how-yukon-glaciers-are-responding-to-climate-change/
94	The Water Cycle	Chemistry, Earth Sciences, Environmental Sciences, Geography	Hydrosphere, Environmental Chemistry, Water Cycle, Biogeochemical Cycles	https://tropicsu.org/the-water-cycle/
95	Has Humanity Pushed Earth into a New Geological Epoch: the “Anthropocene?”	Environmental Sciences, Earth Sciences	Climate Change Overview, Climate History, Recent Climate Change, Anthropocene, Anthroposphere	https://tropicsu.org/has-humanity-pushed-earth-into-a-new-geological-epoch-the-anthropocene/
96	Determining Coastal Vulnerability to Sea-Level Rise	Geography, Earth Sciences	Hydrosphere, Urban Geography, Sea Level Rise	https://tropicsu.org/determining-coastal-vulnerability-to-sea-level-rise/
97	Biogeochemical Cycles and Climate Change	Chemistry, Earth Sciences, Environmental Sciences	Carbon Cycle, Biogeochemical Cycles, Carbon Sequestration, The Geologic Carbon Cycle	https://tropicsu.org/biogeochemical-cycles-and-climate-change/
98	The Impact of Human Activities on the Natural Carbon Cycle	Chemistry, Earth Sciences, Environmental Sciences	Carbon Cycle, Biogeochemical Cycles, Environmental Chemistry	https://tropicsu.org/the-impact-of-human-activities-on-the-natural-carbon-cycle/
99	Quiz on Carbon Cycle	Environmental Sciences, Chemistry, Earth Sciences	Carbon Cycle, Biogeochemical Cycles	https://tropicsu.org/quiz-on-carbon-cycle/

#	Teaching Tool Title	Disciplines	Key Topics	Link
100	Food Security	Environmental Science, Geography, Earth Sciences, Social Sciences	Food Security, Climate Change and Food, Agriculture	https://tropicsu.org/food-security-3/
101	Climate Solutions for Electricity Sector	Environmental Sciences, Economics, Earth Sciences	Carbon Emissions, Adaptation and Mitigation, Climate Change Economics, Economic Growth, Economic Policy, Economic Recovery, Energy, Renewable Energy, Real Estate, Urban Planning	https://tropicsu.org/climate-solutions-for-electricity-sector/
102	Climate Solutions for the Energy Sector	Economics, Social Sciences, Environmental Sciences, Earth Sciences	Carbon Emissions, Climate Change Economics, Economic Growth, Economic Policy, Economic Recovery, Public Policy, Energy, Renewable Energy	https://tropicsu.org/climate-solutions-for-the-energy-sector/
103	The Effects of Sea-level Rise on the Coast of California	Geography, Earth Sciences	Urban Geography, Disasters and Hazards, Hydrosphere, Sea-level Rise	https://tropicsu.org/the-effects-of-sea-level-rise-on-the-coast-of-california/
104	Interactive Quiz on the Water Cycle	Chemistry, Earth Sciences, Environmental Sciences, Geography	Environmental Chemistry, Water Cycle, Biogeochemical Cycles, Hydrosphere	https://tropicsu.org/interactive-quiz-on-the-water-cycle/
105	Water Vapour Feedback and Earth's Climate	Chemistry, Physics, Earth Sciences	Water Cycle, Hydrosphere, Planetary Climate, Earth's Climate, Greenhouse Effect	https://tropicsu.org/water-vapour-feedback-and-earths-climate/
106	Daisyworld – A Model to Explore the Gaia Hypothesis	Earth Sciences, Mathematics and Statistics, Biological Sciences	Earth's Climate, Planetary Climate, Biosphere, Climate Change Overview, Computer Programming, Mathematical Modelling	https://tropicsu.org/a-model-to-explore-the-gaia-hypothesis/

#	Teaching Tool Title	Disciplines	Key Topics	Link
107	NASA Climate Games	Earth Sciences, Environmental Sciences, Geography	Introduction to Climate Change, Biodiversity, Greenhouse Gases	https://tropicsu.org/nasa-climate-games/
108	Planck's Law and Earth's Climate	Physics, Earth Sciences	Climate Physics, Atmospheric Physics, Planck's Law, Blackbody Radiation, Earth Climate System, Stefan-Boltzmann Law, Atmosphere	https://tropicsu.org/plancks-law-and-earths-climate/