

Science Exemplar Module Tasks

Surf & Turf: Exploring Earth's Uneven Surface Heating (6th-8th Science)

Task Template BETA B- Argumentation (Controlled Experimentation Template)

After researching informational texts on how the uneven heating of the earth's surface impacts the environment and conducting an experiment on a factor that impacts surface temperature, write a scientific research paper in which you discuss your background research, experimental methodology, data analysis, and results and argue how a specific factor impacts the earth's surface temperature. Support your position with evidence from your research.

- **D5:** Identify any gaps or unanswered questions.
- **D7:** Include tables and/or charts to help convey your message to your readers.
- **D6:** Include references.
- **D2:** Give one to two example/s from past or current events to illustrate and clarify your position.

What Factors Influence Plant Carbon Dioxide Production and Usage?

Task Template BETA B (6th-8th Controlled Experimentation Template) - Argumentation

After researching informational texts on how plants use and produce carbon dioxide and conducting an experiment on a factor that influences that usage, write a scientific research paper in which you discuss your background research, experimental methodology, data analysis, and results and argue how a specific factor influences carbon dioxide production and usage. Support your position with evidence from your research.

- **D5:** Identify any gaps or unanswered questions.
- **D2:** Give one to two example/s from past or current events to illustrate and clarify your position.
- **D6:** Include references.
- **D7:** Include tables or charts to help convey your message to your readers.

Student Determined Data Analysis—(11th/12th)

Task Template A4 – Argumentation—Data Analysis

After researching available scientific articles about your chosen research topic/question, write a data analysis report in which you argue your findings using the publicly-available data. Support your position with evidence from the text/s.

- **D1:** Be sure to acknowledge competing views.
- **D5:** Identify any gaps or unanswered questions.
- **D6:** Include in-text citations and a bibliography in APA format.
- **D7:** Include charts, tables, and/or graphs to help convey your message to your readers.
- **D11:** Connect the dependent variable(s) and independent variable(s) in your response.
- **D2:** Give at least three example/s from past or current events to illustrate and clarify your position.

Catching Sun with a Donut (9th-12th) Task Template BETA A Design – Argumentation

Which dyes allow us to most efficiently harvest energy from the sun using dye-sensitized solar cells (DSSCs)? After reading the request for proposals (RFP), conducting background research on DSSCs, and designing and testing dyes for DSSCs, write a critical design report in which you describe your design and argue its effectiveness in meeting the requirements of the RFP. Support your response with evidence from your research.

- **D7:** Include data tables to help convey your message to your readers.

Squirmy Science: Design Module for Ecology (6th-8th)

Task Template BETA A – Argumentation (Design Module Template)

How can we most effectively create an ecosystem for mealworms? After reading the Request for Proposal (RFP), conducting background research on mealworms and mealworm ecosystems, and designing and testing a prototype, write a design report in which you describe your design and argue its effectiveness in meeting the requirements of the RFP and providing a superior ecosystem for mealworms. Support your response with evidence from your research.

- **D7:** Include charts, tables, and/or illustrations to help convey your message to your readers.
- **D5:** Identify any gaps or unanswered questions.

Comparing the Chemistry Behind Electricity Generation

9th/10th Task Template 4 - Argumentation

Should electrical energy be generated from nuclear power or fossil fuels? After reading informational texts on how electrical energy is generated from these fuels, write an essay in which you compare the chemistry behind the two methods to generate electricity and argue which is the better method for production of electricity in an urban environment. Support your position with evidence from the text(s). Be sure to consider competing views.

Building Bridges (9th-12th) Task Template 17 - Informational or Explanatory

After researching informational texts on the structure and function of bridges, developing a hypothesis, and conducting an experiment examining live load forces on bridge stability, write a laboratory report in which you explain your procedures and results and confirm or reject your hypothesis. **D 3** What conclusions can you draw?

Comparing the Chemistry Behind Electricity Generation (9th/10th)

Task Template 4 - Argumentation

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Cryobiology (7th-12th) Task Template 2 - Argumentation

Should cryobiology techniques be used to preserve living matter for future use? After reading texts on cryobiology, write an essay in which you address the question and argue if this technique should be used to preserve living matter for future use. Support your position with evidence from the text(s).

Engineering Disciplines (9th) Task Template 11 - Informational or Explanatory

After researching a variety of teacher-selected texts, websites of engineering technical societies, and student-selected articles on engineering disciplines, write a five page report in which you define an engineering discipline of choice and explain job responsibilities, profile of a specific individual in the field, education and training required, advancement possibilities, average salary, and future outlook. Support your discussion with evidence from your research.

Fire Down Below: Examining the Effectiveness of Various Antacids (11th/12th) Task Template

22 - Informational or Explanatory

After researching informational texts and conducting a laboratory experiment on the effectiveness of antacids, write a formal lab report in which you compare the ability of antacids to neutralize excess stomach acid. Support your discussion with evidence from your research.

- **D 4** In your discussion, address the credibility and origin of sources in view of your research topic.
- **D 5** Identify any gaps or unanswered questions.

How are Mitochondria Connected to the Aging Process? Task Template 21- Inform. 8th-11th

How are mitochondria connected to the aging process? After reading "What if you didn't have to grow old?" and "Power Failure", write "What if you didn't have to grow old?" and "Power Failure" in which you analyze the advances scientists are making in slowing down the aging process, providing examples to clarify your analysis

Human Impact on Marine Ecosystems Task Template 21 – Informational/Explanatory (10th-12th)

How have humans negatively impacted marine ecosystems? After reading scientific articles and credible news reports, write an essay in which you analyze possible strategies to remedy the current state of the world's oceans, providing examples to clarify your analysis. **D 3** What conclusions or implications can you draw?

Nuclear Sustainability (11th) Task Template 2 - Argumentation

Is nuclear energy sustainable? After reading articles and your chemistry textbook, write Op-Ed in which you address the question and argue if nuclear energy is sustainable. Support your position with evidence from the text(s).

- **D 1** Be sure to acknowledge competing views.
- **D 2** Give several example/s from past or current events or issues to illustrate and clarify your position.

Pesticides: Blessing, Curse, or Both? Task Template 3 – Argumentation (7th-10th)

After researching the 1948 Nobel Presentation Speech for the discovery of DDT and selected sections of Rachel Carson's "Silent Spring" on DDT, write an essay in which you compare the evidence about DDT's impact from the speech and the book and argue whether the pesticide discovery should have received the Nobel Prize. Support your position with evidence from your research.

Radioactivity and the Search for New Elements Task Template 21 – Informational (10th/12th)

In a time when radioactivity was an unknown, how did Marie Curie use her discoveries to prove radioactivity can be used as a new method for searching for elements? After reading her Nobel Prize Lecture, write report in which you analyze Curie's claim to have proved her own hypothesis that radioactivity is an atomic property, providing examples to clarify your analysis.

Should Animals Be Kept in Zoos? Task Template 4-5.2 – Argumentation (3rd/4th)

Should animals be kept in zoos? After reading informational texts on animals and zoos, write an essay in which you answer the question and explain your reasons for your answer. Support your opinion with evidence from the text/s.

Laws of Conservation and Photosynthesis (8th) Task Template 13 - Informational

After researching texts on Photosynthesis, The Law of Conservation of Matter, and The Law of Conservation of Energy, write an informational essay in which you describe how the photosynthetic process can be used to demonstrate both the Law of Conservation of Matter and the Law of Conservation of Energy. Support your discussion with evidence from your research.

The Effect of Algal Blooms on Marine Ecosystems Task Template 25 – Informational (7th)

What effect do algal blooms have on marine environments off the coast of the United States? After reading scientific texts on fertilizer run-off and algal blooms, write a letter to the Environmental Protection Agency in which you examine the cause(s) of (he causes of algal blooms and explain the effect(s) fertilizer run-off has on the population of algae in marine ecosystems. Support your discussion with evidence from the text(s).

Voyager 1 (7th) Task Template 14 - Informational or Explanatory

What makes the Voyager I space mission special? After reading the information provided from the NASA.gov website about the Voyager I mission, write a report in which you describe the mission and discoveries. Support your discussion with evidence from the text(s).

What are the Causes and Effects of Noise Pollution? (8th) Task Template 24 - Informational

After researching articles on ocean noise pollution, write an essay in which you examine the cause(s) of ocean noise pollution and explain the effect(s) on marine life. Support your discussion with evidence from your research. **D 3** What conclusions or implications can you draw?