

Physics B – Fusion Academy
FINAL ASSESSMENT – PROJECT: PAPER OR PRESENTATION

Project Choice 1: Write a minimum 2,000 word essay discussing the history and development of one of the topics below within modern physics. Citations should use a standard format, such as MLA.

Project Choice 2: Make a minimum 9 minute presentation discussing the history and development of one of the topics below within modern physics. Citations should use a standard format, such as MLA. At minimum a reference page should be included citing all sources. Ideally footnotes should be included on slides needing citations.

Topics:

- God does not play dice!: Deterministic v. Probabilistic
- Failures of Classical Physics: Blackbody Radiation, the Photoelectric Effect and Bohr's Model
- Everything Getting Mixed Up: The Development of the Special Theory of Relativity
- Einstein's Miracle Year in Physics (1905): The Photoelectric Effect, Brownian Motion, Special Relativity and Mass-Energy Equivalence
- Beauty and Truth in Quantum Mechanics and Relativity
- Mix Everything Up, and You Get GUT (Grand Unification Theory)
- Other topic approved by your teacher

Possible Resources:

- TED Beauty and Truth in Physics - http://www.ted.com/talks/murray_gell_mann_on_beauty_and_truth_in_physics
- TED Fusion is Energy's Future - http://www.ted.com/talks/steven_cowley_fusion_is_energy_s_future
- TEDx Breaking Barriers with Quantum Physics - <https://www.youtube.com/watch?v=TlmwLyeWv5M>
- TEDx You are a Simulation and Physics Can Prove It - <https://www.youtube.com/watch?v=Chfoo9NBEow>
- TEDx – Richard Feynman - <https://www.youtube.com/watch?v=hpjwotips7E>
- TED Have We Reached the End of Physics? - <https://www.youtube.com/watch?v=gWPFJgLAzu4>
- TEDx – Feynman Diagrams - <https://www.youtube.com/watch?v=3SYW6eZFHwU>
- TED-Ed – Einstein's Miracle Year - <https://www.youtube.com/watch?v=91XI7M9l3no>
- Crash Course – The History of Atomic Chemistry - <https://www.youtube.com/watch?v=thnDxFdkzZs>
- Minute Physics – The Origin of Quantum Mechanics - <https://www.youtube.com/watch?v=i1TVZIBj7UA>
- TEDx – “Spooky” Physics - https://youtu.be/wZzHnZzm_58

Essay Rubric: Each category is worth 4 points, and the essay will be graded out of 24 points.

Category	Excellent	Good	Fair	Poor
Completeness	The essay covers all major and some minor developments within the chosen topic. (4 pts)	The essay covers all major and no minor developments within the chosen topic. (3 pts)	The essay covers some major and/or minor developments within the chosen topic. (2 pts)	The essay covers few or no developments within the chosen topic. (1 pts)
Support for Topic (Content)	Relevant, telling, quality details give the reader important information that goes beyond the obvious. (4 pts.)	Supporting details and information are relevant, but one key issue or portion of the key storyline is not present. (3 pts.)	Supporting details and information are relevant, but several key issues or portions of the storyline are not present. (2 pts.)	Supporting details and information are typically unclear or not related to the topic. (1 pt.)
Accuracy of Facts (Content)	All supported facts are reported accurately. (4 pts.)	Almost all supportive facts are reported accurately. (3 pts.)	Most supportive facts are reported accurately. (2 pts.)	NO facts are reported OR most are inaccurately reported. (1 pt.)
Capitalization & Punctuation (Conventions)	Write makes no errors in capitalization or punctuation, so the paper is exceptionally easy to read. (4 pts.)	Write makes 1 or 2 errors in capitalization or punctuation, but the paper is still easy to read. (3 pts.)	Writer makes a few errors in punctuation that catch the reader's attention. (2 pts.)	Writer makes several errors in capitalization and/or punctuation that catch the reader's attention. (1 pt.)
Grammar and Spelling (Conventions)	Writer makes no errors in grammar or spelling that distract the reader from the content. (4 pts.)	Writer makes 1-2 errors in grammar or spelling that distract the reader from the content. (3 pts.)	Writer makes 3-4 errors in grammar or spelling that distract the reader from the content. (2 pts.)	Writer makes more than 4 errors in grammar or spelling that distract the reader from the content. (1 pt.)
Word count*	>2,000 words (4 pts)	>1,750 words (3 pts)	>1,250 (1 pts)	<1,400 words (0 pts)

*For every additional, 400 words beyond the 2,000 word minimum an additional point up to a total of 8 points for a 3,600 word essay.

Presentation Rubric:

Category	Excellent (8 pts)	Good (6 pts)	Fair (4 pts)	Needs Improvement (2 pt)
Delivery	<ul style="list-style-type: none"> • Holds attention of entire audience with the use of direct eye contact, seldom looking at notes • Speaks with fluctuation in volume and inflection to maintain audience interest and emphasize key points 	<ul style="list-style-type: none"> • Consistent use of direct eye contact with audience, but still returns to notes • Speaks with satisfactory variation of volume and inflection 	<ul style="list-style-type: none"> • Displays minimal eye contact with audience, while reading mostly from the notes • Speaks in uneven volume with little or no inflection 	<ul style="list-style-type: none"> • Holds no eye contact with audience, as entire report is read from notes • Speaks in low volume and/ or monotonous tone, which causes audience to disengage
Content/Organization	<ul style="list-style-type: none"> • Demonstrates full knowledge by answering all class questions with explanations and elaboration • Provides clear purpose and subject; pertinent examples, facts, and/or statistics; supports conclusions/ideas with evidence 	<ul style="list-style-type: none"> • Is at ease with expected answers to all questions, without elaboration • Has somewhat clear purpose and subject; some examples, facts, and/or statistics that support the subject; includes some data or evidence that supports conclusions 	<ul style="list-style-type: none"> • Is uncomfortable with information and is able to answer only rudimentary questions • Attempts to define purpose and subject; provides weak examples, facts, and/ or statistics, which do not adequately support the subject; includes very 	<ul style="list-style-type: none"> • Does not have grasp of information and cannot answer questions about subject • Does not clearly define subject and purpose; provides weak or no support of subject; gives insufficient support for ideas or conclusions
Enthusiasm/Audience Awareness	<ul style="list-style-type: none"> • Demonstrates strong enthusiasm about topic during entire presentation • Significantly increases audience understanding and knowledge of topic; convinces an audience to recognize the validity and importance of the subject 	<ul style="list-style-type: none"> • Shows some enthusiastic feelings about topic • Raises audience understanding and awareness of most points 	<ul style="list-style-type: none"> • Shows little or mixed feelings about the topic being presented • Raises audience understanding and knowledge of some points 	<ul style="list-style-type: none"> • Shows no interest in topic presented • Fails to increase audience understanding of knowledge of topic
Media/ Graphics	<ul style="list-style-type: none"> • Effective, smooth and efficient use of media and graphics. • Graphics/media are well-made, creative, clear and accurate. 	<ul style="list-style-type: none"> • Effective but, rough or inefficient use of media and graphics. • Graphics/media are slightly unclear and accurate. 	<ul style="list-style-type: none"> • Effective but, rough and inefficient use of media and graphics. • Graphics/media have minor inaccuracies. 	<ul style="list-style-type: none"> • Ineffective or no use of graphics/media. • Graphics/media are slightly unclear and accurate.
Topic Coverage	The presentation covers all major and some minor developments within the chosen topic.	The presentation covers all major and no minor developments within the chosen topic.	The presentation covers some major and/or minor developments within the chosen topic.	The presentation covers few or no developments within the chosen topic.
Time Length*	>9 minutes (8 pts)	>7 minutes (6 pts)	>6 minutes (3 pts)	<6 minutes (2 pts)

* An additional point will be added for every additional minute above 9 mins for a maximum total length of 12 minutes. Every additional 30 seconds beyond 12 minutes will result in a 2 point deduction.