

# 05: Quantum

Content Area: **Science**  
Course(s): **Honors Physics, AP Physics 2**  
Time Period: **January**  
Length: **1**  
Status: **Published**

## Enduring Understandings:

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- Brightness of light is based on the number of photons present.
- Electrons can have wave properties
- Light can knock electrons off an atom.
- Light has both wave properties and particle properties
- Photons are small bundles of energy. The energy depends on the frequency of light
- Valid orbitals are ones that have whole number of wavelengths

## Essential Questions:

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- Is light a wave or particle?
- Why are certain orbitals valid and others not?

## Lesson Titles:

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- Bohr Model
- d'Broglie Hypothesis
- Models of the Atom
- Photoelectric Effect
- Photons

## Career Readiness, Life Literacies & Key Skills

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WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

## Inter-Disciplinary Connections:

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LA.RH.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and
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	media (e.g., visually, quantitatively, qualitatively, as well as in words) in order to address a question or solve a problem.
LA.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
LA.RST.11-12.10	By the end of grade 12, read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.
LA.WHST.11-12.1.A	Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
LA.WHST.11-12.1.B	Develop claim(s) and counterclaims using sound reasoning and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.
LA.WHST.11-12.1.C	Use transitions (e.g., words, phrases, clauses) to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
LA.WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.11-12.2.E	Provide a concluding paragraph or section that supports the argument presented.
LA.WHST.11-12.10	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

## **Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:**

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- Chromebook Activity
- Independent Studies
- Lectures on Models of the Atom, Bohr Model, Photons, Photoelectric Effect, and the d'Broglie Hypothesis
- Problem Solving
- Science Labs

## **Modifications**

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## **Formative Assessment:**

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- Anticipatory Set
- Closure
- Quizzes on Models of the Atom, Bohr Model, Photons, Photoelectric Effect, and the d'Broglie Hypothesis
- Warm-Up

## **Summative Assessment:**

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- Alternate Assessment
- Benchmark on Quantum Physics
- Marking Period Assessment

## **Alternative Assessments:**

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Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Reflective pieces

Concept maps

Case-based scenarios

Portfolios

## **Benchmark Assessments:**

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Skills-based assessment

Reading response

Writing prompt

Lab practical

## **Resources & Materials:**

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- <https://sites.google.com/site/delseaphysics1/Home>