Qiskit Computational Literacy Unit: The Quantum Vault

Target Grade Level: Grade 6 **Unit Designer:** Noor **Qiskit Project:** Quantum Curriculum for All

Part 1: Unit Plan and Pedagogical Framework

1. Unit Goal and Learning Objectives

Unit Goal: Students will develop a foundational understanding of the quantum model by recognizing its necessity in solving the **profound defects** of classical physics and will apply this understanding to conceptual quantum programming.

Focus Area	Objective (The student will be able to...)	Bloom's Level
Science/Literacy	**Define** and **Compare** the Classical (Bohr) and Quantum (Wave) atomic models.	Analyzing, Understanding
Mathematics	**Apply** the 100% probability rule ($\alpha\%+\beta\%=100\%$) to solve basic algebraic equations.	Applying
Computational	**Sequence** conceptual quantum commands (Hadamard Gate, Measurement) to design a simple Quantum Circuit.	Creating

2. Methodology: Lesson Flow & Conceptual Change (Class Teacher)

The following sequence utilizes the **Kinesthetic Starter** to establish a foundation for the entire unit.

Time	Phase	Action / Teacher Script Focus	VAK Focus
5 min	**The Quantum Bubble Hook**	**Action:** Students observe bubbles. **Script:** "The electron **IS** a **Quantum Energy Wave**. This bubble models its **fuzziness** and **non-locality**."	Kinesthetic, Visual

10 min	Conceptual Conflict	**Action:** Teacher presents the flawed **Bohr/Solar System Model**. **Script:** Acknowledge student challenge and confirm the **"Profound Defect"** (the crash problem). Introduce the Quantum Wave as the **stable solution**.	Auditory, Analytical
5 min	Measurement Link	**Action: (Recommended)** Teacher intentionally pops a bubble. **Script:** "The only time the stable wave collapses is when *we* intentionally use the **Measurement Command** to force it into a definite answer."	Kinesthetic, Auditory

Part 2: Subject-Specific Worksheets (Student Assignments)

These assignments are to be handed out to and graded by the corresponding subject teacher.

Subject	Assignment Title	Core Skill Assessed
Science	**Worksheet: Comparing the Atomic Models**	Categorizing concepts (Particle vs. Wave) using a **Venn Diagram** (Conceptual Analysis).
English/Literacy	**Worksheet: The Quantum Vault Narrative**	Reading comprehension, inferential reasoning, and vocabulary acquisition from the passage.
Mathematics	**Worksheet: Algebra and Probability**	Solving linear equations for an unknown variable X, tied to the α%+β%=100% probability rule.
Computer Science	**Worksheet: Qiskit Computational Logic**	Understanding Qubit states, sequencing the **Hadamard** and **Measurement** Gates, and predicting binary outcomes (Computational Thinking).

Part 3: Research and Extension Component

These topics are for student inquiry or mentor/teacher background knowledge.

Topic	Key Concept	Relevance to Unit
Magnitude	The measure of size or quantity (the absolute value).	The percentage chance (α%/β%) represents the **magnitude** of probability for a given outcome.
Greek Notation	The use of Greek letters in science and math.	The symbols α and β (Alpha and Beta) are used to represent the two possible **magnitudes** of the Qubit's state.