Week 1 Plan: Qubits & Measurement Curriculum Development - Tier 1

Deliverable	Target Audience: Grade 6-8
Notebook Framework	**Tool Focus: IBM Quantum Composer (The visual, drag-and-drop interface)**
This notebook should be designed as a guided worksheet experience where students perform simple operations in the Composer and record their conceptual observations in the notebook's markdown cells.	

Concept	Objectives	Key Qiskit Tool
Qubit & Superposition	Explain the qubit (can be 0, 1, or both) using a simple, relatable analogy like a spinning coin.	IBM Quantum Composer: Use the visual interface to apply the Hadamard (H) gate to put a qubit into equal superposition.
Measurement	Explain the process of measurement as forcing the coin to land. Demonstrate the probabilistic outcome (about 50/50 over many runs).	

1. Notebook Metadata & Setup		
Section	**Content Requirement**	**Focus**
Title	Tier 1: The Quantum Coin Flip (Qubits & Measurement)	Clear and engaging.
Prerequisites	None (only basic web browsing skills).	Sets expectation for the teacher.
Analogy Introduction	Explain the qubit using the spinning coin or halfway light switch analogy, or Framework Worksheets activity	Must be visual and relatable.

2. Lab 1: Getting Started with the Qubit (Hands-On)		
Section	**Instruction in Notebook**	**Expected Student Action (Composer)**
Classical Bit (0/1)	Step 1: "In the Composer, drag the 'X' gate onto the first line. See how the histogram is 100% 1?"	Students confirm the basic classical state flip.

Question 1 (Worksheet)	Record: "When is the outcome always guaranteed? (The classical state)"	Students record their observation in a markdown cell.

3. Lab 2: Creating the Superposition State		
Section	**Instruction in Notebook**	**Expected Student Action (Composer)**
The Quantum State	Step 2: "Remove the 'X' gate. Now, drag the Hadamard (H) gate onto the first line. This is our spinning coin!"	Students create the superposition state visually.
Measurement & Runs	Step 3: "Run the simulation with 100 shots. Do you get exactly 50 0s and 50 1s?"	Students execute the H-gate + Measurement circuit on the simulator.
Question 2 (Worksheet)	Record: "In your own words, what does the H gate do to the spinning coin? Why does the outcome change every time you run it?"	Students articulate the concept of superposition and randomness.

4. Noise: The "Glitch"		
Section	**Instruction in Notebook**	**Expected Student Action (Composer)**
Noise Introduction	Markdown explanation: Noise means mistakes happen. Think of it as a glitch or static interfering with the quantum computer.	Teacher talks about it; students read the simple concept.
Activity/Challenge	"Now, try to make the Qubit land on 0 by only using the X gate (no H gate). Run it 100 times. Does noise change the answer?"	Students confirm that noise has little effect on classical deterministic states, keeping the noise concept simple for this tier.

5. Summary and Reflection
Key Takeaways: A bulleted list summarizing the concepts learned: Qubit, Measurement, and Probabilistic Outcome.
Final Question: A short reflection prompt (e.g., "What is the biggest difference between a classical computer's bit and the quantum computer's qubit?").
This structured notebook (as a worksheet) allows students to practice the core operations using the visual Composer, providing that vital active practice required by Music and/or Quanta Queen model.