Authentic Assessment Design Using PhET (Formative Assessment)

Learning Objective:
Students will demonstrate understanding of how specific organelles contribute to cell function, particularly transport, by using an interactive model to observe and explain cellular processes.

Assessment Title:
Cell Transport Investigator: Using PhET to Explain Organelle Functions

Digital Tool:
PhET Interactive Simulations – "Cell Membrane"
https://phet.colorado.edu/sims/html/membrane-transport/latest/membrane-transport_all.html

Assessment Description

Students work through the **Cell Membrane** simulation to explore how substances move across the plasma membrane. After interacting with the model (adding channels, adjusting molecule types, observing diffusion, etc.), they complete a **digital field report** that connects the simulation to organelles and their functions.

Student Tasks

Inside the digital field report, learners submit:

1. **Two screenshots** from the PhET simulation showing different types of transport (passive and active transport).
2. An explanation of how the **cell membrane (organelle)** regulates movement of materials in and out of the cell.
3. A short description of how at least **two other organelles** support the transport or energy needs of the cell (e.g., mitochondria for ATP during active transport, Golgi for packaging).
4. An analogy that connects cell transport to a real-world system (e.g., "The cell membrane is like a security gate").
5. Identification of which cell types (plant, animal, bacterial) have each organelle mentioned.