SHM-UNO: 54-Card Master Deck

This document provides the complete list of 54 cards for SHM-UNO, including exact wording for each card and hints for SHM concepts. Use this as a print-ready master deck guide.

# 1. Number / Quantity Cards (40 cards)

Each card has 2 copies.

## 🔴 Red – Displacement

+A : Displacement maximum. Velocity = 0, KE = 0, PE = max.

+A/2 : Displacement positive mid. Velocity positive, acceleration negative.

0 : At equilibrium. Velocity = max, KE = max, PE = 0.

–A/2 : Displacement negative mid. Velocity negative, acceleration positive.

–A : Displacement maximum negative. Velocity = 0, KE = 0, PE = max.

## 🔵 Blue – Velocity

+v\_max : Velocity maximum at equilibrium. Displacement = 0, KE = max, PE = 0.

+v\_max/√2 : Intermediate velocity at y = +A/√2. KE < KE max, PE < PE max.

0 : Velocity zero at maximum displacement. Displacement = ±A, KE = 0, PE = max.

–v\_max/√2 : Intermediate velocity at y = –A/√2. KE < KE max, PE < PE max.

–v\_max : Velocity maximum negative at equilibrium. Displacement = 0, KE = max, PE = 0.

## 🟢 Green – Acceleration

+a\_max : Acceleration maximum positive at –A. Velocity = 0, displacement = –A.

+a\_max/2 : Acceleration intermediate positive at y = –A/2. Velocity negative, KE moderate.

0 : Acceleration zero at equilibrium. Displacement = 0, velocity = max.

–a\_max/2 : Acceleration intermediate negative at y = +A/2. Velocity positive, KE moderate.

–a\_max : Acceleration maximum negative at +A. Velocity = 0, displacement = +A.

## 🟡 Yellow – Energy

KE = 0 : At max displacement. Velocity = 0, PE = max.

KE max : At equilibrium. Velocity = max, PE = 0.

PE = 0 : At equilibrium. KE = max, displacement = 0.

PE max : At max displacement. KE = 0, displacement = ±A.

TME constant : Total mechanical energy stays constant. KE + PE = constant.

# 2. Action Cards (10 cards)

Period Reset (Skip) ×2 : Skip next player unless they recall: T = 2π√(m/k) or T = 2π√(L/g).

Oscillation Reversal (Reverse) ×2 : Reverse the order of play.

Amplitude Boost (+2) ×2 : Next player draws 2 unless they explain how doubling amplitude affects energy (E ∝ A²).

Graph Challenge ×2 : Next player must identify a graph type: displacement-time, velocity-time, acceleration-time, or energy-displacement.

Formula Check ×2 : Ask an opponent to state y(t), v(t), or a(t) equation.

# 3. Wild Cards (4 cards)

Energy Exchange (Wild) ×2 : Choose next color/quantity type to continue play.

Resonance (Wild +4) ×2 : Next player draws 4 unless they solve mini SHM problem: e.g., v\_max = ωA.