

Module 3 – Conservation Laws – Instructions

INTRODUCTION

- 1 The conservation of momentum states that the total momentum of system is constant (or conserved) if there are no external forces on the system. Likewise, the conservation of energy states that energy cannot be created or destroyed, only transformed.
- 2 In this experiment, the Newton's Cradle simulation will involve the conservation of linear momentum, conservation of energy, and Newton's Third Law.

LEARNING OUTCOMES (FROM SYLLABUS)

- Solve a variety of basic problems in particle kinematics (uniform motion and accelerated motion, including “free fall”), dynamics using Newton's Laws of Motion and the conservation laws of energy and momentum (e.g., collisions), fluid mechanics (including Archimedes' and Bernoulli's Principles), thermodynamics, wave motion, basic electricity (Coulomb's and Ohm's Laws), and radioactive decay.
- Interpret the results of simple experiments and demonstrations of physical principles.

EXPERIMENT SIMULATION

Use this Experiment Simulation¹ to conduct the experiment according to the instructions below. Follow the instructions explicitly.

WORKSHEET

Please print the worksheet for this experiment. You will need this sheet to record your data.

NEWTON'S CRADLE

- a Click on the Newton's Cradle ² link to start the next simulation.
- b Read the directions on how to use the simulation.
- c Observe one ball swinging. Next, observe and describe what happens when two balls, three balls, and finally four balls are swinging, and record your observations on the worksheet.

¹<http://www.walter-fendt.de/html5/phen/newtoncradle.en.htm>

²<http://www.walter-fendt.de/ph14e/ncradle.htm>