

### The scenario

<b>Subject</b>	<b>Mechanics / Newton's cradle</b>
<b>Length</b>	3:41
<b>Main objectives</b>	Applications of physical laws of conservation of energy and momentum.
<b>Detailed objectives</b>	
<b>Structure and description of experiments:</b>	
<b>1. Introduction</b>	Description: The motivation for the experiment will be the investigation of elastic collisions, the transformation of potential energy into kinetic energy and vice versa, changes in the momentum of the system.
<b>2. Main subject</b>	Description: Understand the law of conservation of mechanical energy, the law of conservation of momentum.
<b>Part 1</b>	
<b>(0:40),</b>	<b>Tools:</b> Newton's cradle
<b>Experiment 1 (0:46),</b>	<b>Description:</b> If we deflect the rightmost ball, release it and let it hit the next ball, only the leftmost ball will bounce. Others (the middle balls do not move). And then the whole process is repeated, after the impact of the left ball on the neighbouring one, only the far right ball bounces off. And the whole process is repeated over and over.
<b>Experiment 2 (1:23),</b>	After the two balls on the right side are deflected and then released and hit by the rest of the balls, the two balls on the left side are also deflected.
<b>Experiment 3 (2:04),</b>	The question is how many balls will be deflected if we carry out the experiment by deflecting three balls, since only two balls will remain in the original position. After three balls are deflected and subsequently hit two balls, the whole situation is repeated, three balls are deflected again, even if the system of three balls hits only two balls.
<b>Experiment 4 (2:55)</b>	We will repeat the experiment with the deflection of four balls. Pupils and students themselves could predict and answer how many balls will now deviate after the impact. <b>Questions:</b> What does the Law of Conservation of Mechanical Energy and Momentum say? <b>Conclusions:</b> In an isolated physical system, the total energy is unchanging, energy does not arise or disappear, but is only transformed from one form of energy to another form of energy or to other forms of energy.

<b>3. Summary, evaluation and notes</b>	<b>Application:</b> flexible collisions, pool, billiards,  After some time, the balls stop bouncing, as the mechanical energy decreases during impacts, it turns into internal energy, heat. <b>Level:</b> secondary school (ISCED 3 / 1st year)
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