

Friends of Longford Park

Friction and Mass

Lesson Plan

Approximate duration:	30 minutes
Suitable for:	Key Stage 2, 3
Learning objective:	To understand how friction and gravity act upon objects.
Overview:	Slides can illustrate how gravity causes objects to move downwards but the speed at which this happens is determined by the amount of friction and the mass of the object. Slides can also be used to illustrate or reinforce concepts of potential and kinetic energy.
Location:	Play areas near the former Longford Hall or in the northern area of the park.
Materials required:	<ul style="list-style-type: none">• Different pieces of fabric, plastic or rubber large enough for a child to sit on going down a slide• Watch or stopwatch• Pens and paper
Session Plan:	<p>Show children the different pieces of fabric.</p> <ul style="list-style-type: none">• Of the materials available, what would make for the fastest ride down the slide?• Test this out by trying different options and timing the results.• Have children go on the slide, simply sitting down and raising their feet. Then see what happens if you put your feet down on the slide, pressing lightly and then more heavily. Again, time the results.• Place a variety of objects on the slide to see how they behave. How does the weight (mass) of an object affect how it behaves on the slide? Again, time the results. <p>Friction acts against the force of gravity, in some cases, completely preventing an object from moving downwards. Only when the force of gravity is greater than the force of friction will an object move. The force exerted by gravity is proportionate to an object's mass so that the heavier the object, the more it can overcome a given amount of friction.</p>

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- Extension Activity:
- What different types of energy does an object possess at different points on the slide? Children could draw a diagram of this.
 - How is potential energy converted into kinetic energy and vice versa during a ride down a slide?

An object sitting still at the top of a slide possesses potential energy. When a force powerful enough to overcome friction is exerted upon it, the potential energy is converted into kinetic energy. Momentum and gravity then act upon the object is to move it down the slide until the object is brought to a rest by the loss of momentum and the action of friction. At that point, the kinetic energy is transformed back into potential energy.