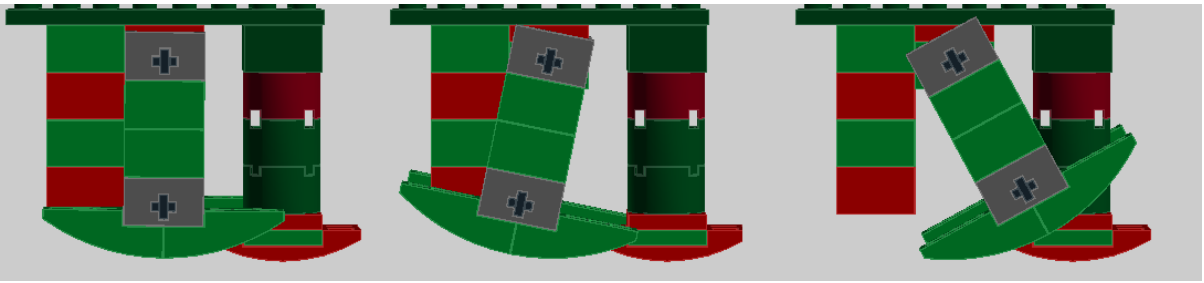
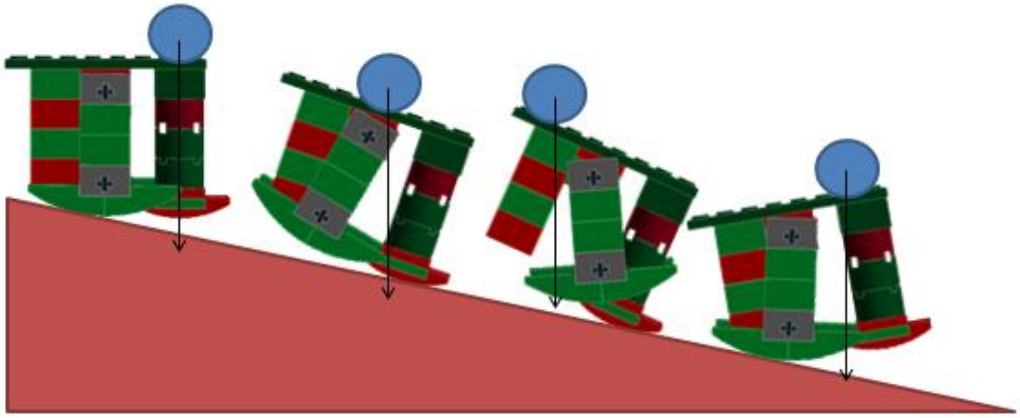
LEGO Resources
Gravity Walking Animals
(Passive Dynamic Walker)

Teachers: Build a base

Before you start, you will need to build a working base, consisting of two fixed legs (Front and Rear) and two legs that form a pendulum. Example below.



The walker works like a pendulum, moving the resultant centre of mass (Blue circle marked below) of the learner's model in a circle in relation to the slope and rear leg of the model. This will depend largely on the friction on the feet of the base and therefore the angle of the ramp.



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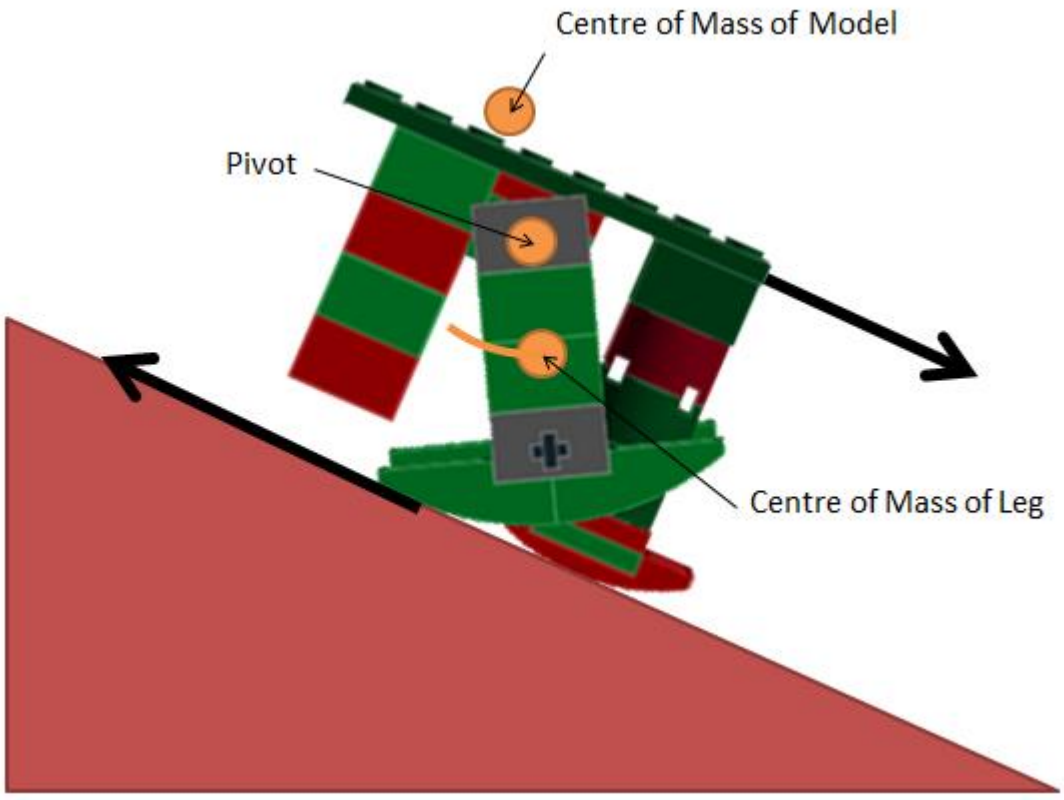
Learners: Aims and Objectives

Create a walker, this could be based on an Animal, Vehicle or something alien, but the success of their walker will depend on where about its centre of mass is in relation to the centre of mass of the legs of the walker. Too far forward and it will not right its legs as it descends causing it to slide or trip and fall. Too far back and the same will be true.

There are two ways to fix this; the easiest is to change the steepness of the ramp changing the relative location of the centres of masses (below) otherwise the model will need to be redesigned. This is easier with blocks as bricks can be added or removed. However an alternative is to add weights on the opposing side.



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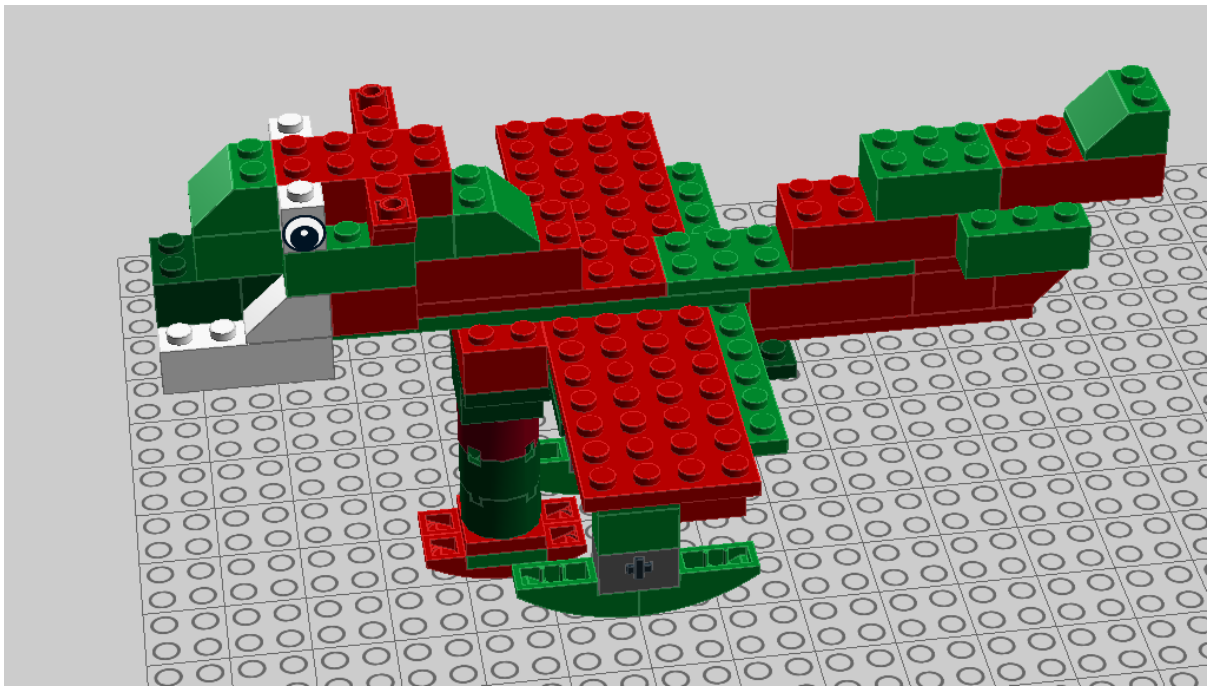
Below is an example of a working model using the base from above.



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