

EPPro8 Challenge

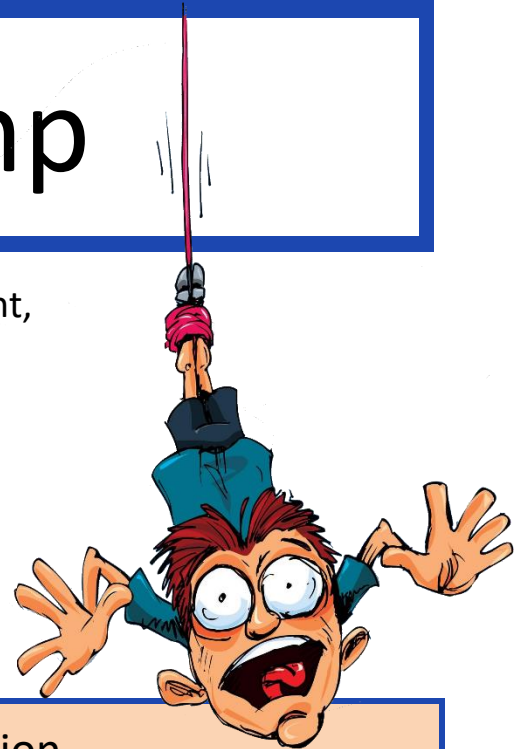
Engineer Problem Solve Innovate

Bungy Jump

For a great bungy jump the jumper jumps from a height, rebounds close to the ground below and recoils to a maximum height.

A very bad bungy jump sees the jumper go – splat.

Experiment with different combinations of rubber bands to achieve a great jump.



Bungy Platform Construction

Criteria	A jumping platform is at least 1.6 metre above the ground. The 1kg weight can sit on the platform before being pushed. The structure must be rigid (it does not wobble).
Hint	Use diagonal bracing to make the structure rigid.

Bungy Jump: Rebound

Criteria	The 1kg weight is pushed from the platform. The weight must fall at least 1m before rebounding. The weight must not hit the ground.
Hint	Be systematic with how you solve this. Only change one variable at a time and always write down what you try and what the results are. Rubber bands can be connected both in parallel and in series. More bands in parallel will make the bungy stronger. More bands in series will mean the fall is longer.



Parallel



Series

Bungy Jump: Rebound – Close to the Ground

Criteria	The 1kg weight is pushed from the platform. The weight is closer than 100mm to the ground when it rebounds. The weight must not hit the ground.
Hint	Adjust the length of the chain of rubber bands to achieve the length required. If your rubber band chain is too thin it will break or stretch and be unreliable.

Bungy Jump: Recoil

Criteria	The 1kg weight is pushed from the platform. The platform is at least 1.5m above the ground. The weight is less than 100mm from the ground when it rebounds. The weight then recoils up to a height of at least 1.1 metres.
Hint	A thin chain of rubber bands is not as efficient as a thick chain as it will over stretch and lose energy. Make a nice thick chain of rubber bands to achieve more recoil.

Heavy Jumper

Criteria	The 2kg weight is pushed from the platform. The weight is less than 100mm from the ground when it rebounds.
Hint	This is double the weight. What effect will this have on your rubber band chain?

Maximum Recoil

Criteria	Changing any of the above parameters (height, weight etc), configure a bungy jump that rebounds within 100mm of the ground, but recoils to a height of at least 1.5m
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After you have attempted this challenge, watch the tutorial to see our solution at www.EPro8Challenge.co.nz/Tutorial and enter the Challenge Code **BNJP**.