

EPPro8 Challenge

Engineer Problem Solve Innovate

Party Popper



It is your friend's birthday party and you want to give her a massive surprise when she arrives at school.

You have the idea of building a party popper contraption that will be triggered when your friend picks up a present and will fire party poppers from all different angles.

Be careful in these challenges to never have the party poppers pointing towards anyone's face.

Mounting Frame

Criteria	A mounting frame is approximately 700mm wide, 700mm deep and 200mm tall.
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Crank Handle Triggered

Criteria	One party popper is attached to the frame and points towards the centre of the frame. A reel and a crank handle are attached to an axle. Winding the crank handle causes a party popper to fire.
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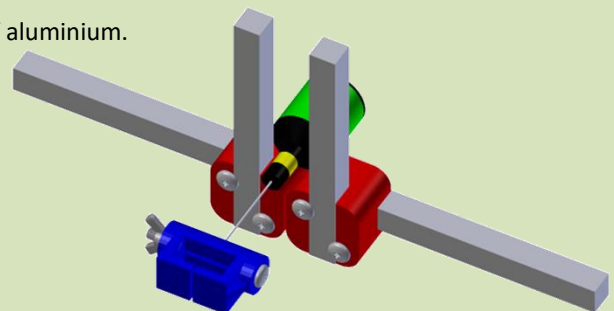
Hint

Mount the party popper between two pieces of aluminium.

It can be tricky to tie rope to the party popper's string.

Instead, use two blue joiners and a bolt to clamp onto the string.

This creates a hook that you can then easily tie rope to.



Multi Shot

Criteria	Four party poppers are attached to the frame and point towards the centre of the frame. Turning the crank handle causes the party poppers to fire one at a time.
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Backfire

Criteria	The party popper is mounted on the opposite side of the frame from the crank handle and points towards the centre of the frame. Winding the crank handle causes a party popper to fire. The rope connecting the party popper and the crank handle must NOT go through the middle of the frame.
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Hint

Use pulleys to direct the rope from the party popper, around the frame to the reel.
Use a pulley every time you change the direction of the rope.

Coming from Everywhere...

Criteria	Four party poppers are mounted, one on each side of the frame. All four party poppers point towards the centre of the frame. Turning the crank handle fires all four party poppers.
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Motorised Party Popper

Criteria	Use the online electronics simulator, code PRTY . The party popper machine is motorised. When a button is pressed the party popper is triggered.
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Booby Trap

Criteria	If the present is NOT on the table then the party popper is automatically fired.
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Hint

Use a limit switch to detect when the present is on the table.
Use the NOT box to determine if the present is NOT on the table.

Party Popper Sequence

Criteria	<p>Four party poppers are attached to a SEQUENCE box so that they trigger one at a time.</p> <p>If the present is NOT on the table then the party poppers are fired in sequence.</p>
Hint	<p>Use a SEQUENCE box to create a loop, with the following:</p> <ul style="list-style-type: none">• The present NOT on the table: TRIGGER 1• STEP 1 is connected to TRIGGER 2• STEP 2 is connected to TRIGGER 3• STEP 3 is connected to TRIGGER 4

After you have attempted this challenge watch the tutorial to see our solution at www.EPro8Challenge.co.nz/Tutorial and enter the Challenge Code **PRTY**.