



EP8 Challenge

Engineer Problem Solve Innovate

Burglar Alarm

There has been a recent spate of art theft.
The prized painting at the art gallery: stolen.
The priceless statue at the museum: stolen.
The beautiful woven tukutuku panel at the marae: stolen.

Look at the artwork around your classroom.
These are next on the burglars list of targets.

Construct a burglar alarm for your classroom that
will be triggered when a burglar enters the classroom.



Alarm Sound

Criteria	An arm is attached to a frame using an axle. This is spring-loaded using rubber bands. When the arm is released it hits a pot making a loud sound.
Hint	Build a catapult structure. The energy stored in the rubber band will be transferred to the arm then the pot – making SOUND.

Setting the Alarm

Criteria	The arm is locked in the armed position by an aluminium rod. When the rod is pulled out the arm swings, hitting the pot
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Window Alarm

Criteria When a window is opened the alarm sounds.

Hint Connect a rope from the window to your alarm.
You may need to secure your alarm to a desk so it doesn't move.

Trip Wire

Criteria A rope zig-zags around the room at least six times and at different heights.
If any of the rope is triggered the alarm will sound.

Hint Tie pulleys to anything in your room with short lengths of string.

Artwork Sensor

Criteria The alarm sounds if a piece of art is lowered from the wall.

Hint Lowering the artwork will not pull on the string. You will need to add a pulley above the artwork.

Laser Trip Sensors

Criteria Use the online electronics simulator, code **BRGL**.
Replace the trip wire with a laser.
Mirrors direct the laser to zig-zag across the room at multiple heights.
When the beam is broken the buzzer sounds.

Continuous Alarm

Criteria When the beam is broken the buzzer turns ON and stays ON until a secret hidden OFF button is pressed.

Hint Use the ON/OFF box to keep the buzzer on.

Secret Password

Criteria	The buzzer is turned OFF by the following “secret” combination of four buttons: Button 1 AND Button 2 AND NOT Button 3 AND Button 4
Hint	Use the AND box and the NOT box to achieve the secret password combination.

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