

### The Puzzle

A school play has 2 spotlights for its stage: **RED** and **GREEN**.

The colour of the stage depends on which lights are turned on.

The table below shows the 4 possible combinations.

RED	GREEN	STAGE light
OFF (0)	OFF (0)	BLACK
OFF (0)	ON (1)	GREEN
ON (1)	OFF (0)	RED
ON (1)	ON (1)	YELLOW

The lights for the show will repeat the sequences below from the start:

RED Light sequence:            2 minutes ON, 2 minutes OFF, then repeat.

GREEN Light sequence :        1 minute OFF, 2 minutes ON, then repeat.

What will the stage colour be in the 6<sup>th</sup> minute of the show?

## Solutions

There are a variety of ways to solve this problem.

### Counting out the Sequence

This is possibly the most common response to this puzzle.

The RED light is 2 minutes ON, 2 minutes OFF, then 2 minutes ON.

So, in the 6<sup>th</sup> minute the RED light is ON.

The GREEN light is 1 minute OFF, 2 minutes ON, then 1 minute OFF, 2 minutes ON.

So, in the 6<sup>th</sup> minute the GREEN light is ON.

In the 6<sup>th</sup> minute, RED is ON and GREEN is ON : Stage Light is YELLOW.

### Solution using a GRID

Drawing a grid can often help to break down a complex problem into simpler parts.

	1 <sup>st</sup> min	2 <sup>nd</sup> min	3 <sup>rd</sup> min	4 <sup>th</sup> min	5 <sup>th</sup> min	6 <sup>th</sup> min
<b>RED</b>			OFF	OFF		
<b>GREEN</b>	OFF			OFF		
<b>STAGE</b>						

## Try these ones ....

There are lots more problems on our website ([ncca.ie](http://ncca.ie)) or on [bebras.uk](http://bebras.uk) where drawing a grid can help solve a problem in a systematic fashion or sometimes allow you to see a solution to a puzzle.

**Another Puzzle (where a grid might help)**

3 friends decide to go on a trip in their new electric cars.

Their batteries are empty and need to be re-charged.

It takes 3 hours to fully charge the car battery.

The problem is there are only 2 charging points available.

The cars don't have to be charged all in one go.

How soon can they leave with fully charged batteries?

