LED Throwies are designed to stick to steel objects and can be made for under a dollar each. A ping-pong ball can act as a diffuser but adds extra weight.

Color-changing LEDs are inexpensive, easy to use and add ‘action’.

www.hcpl.net

Jocelyn H. Lee Innovation Lab
Throwies

A ‘throwie’ is about as simple of a circuit to be found – just a coin cell connected to an LED and attached to a magnet with a bit of tape – all for about $1 each (or less in large quantities). A common enhancement is to insert the throwie into a ping-pong ball which acts as a light diffuser, though adds weight to the project. The traditional use of throwies is ‘urban graffiti’, where many throwies may be attached to (or thrown on) steel portions of buildings, signs or bridges. Variations can be also be used to add lighting effects to projects and models or used with long-exposure photography for light painting.

Although a resistor is normally needed in a circuit to protect the LED from high electrical currents, the lithium coin cells used in this project cannot sustain sufficient current to damage the LED, so a resistor is not required.

A throwie will stay lit for several days or even a couple of weeks depending on the weather, type of LEDs used and quality of the 3-volt coin cell. Inexpensive, flashing RGB (‘red-green-blue’) LEDs are available which add a bit of animation to the display. Each color requires slightly different voltages, so as the coin cell wears down, the colors may change.

Here is a sample part list for a simple color-changing throwie:

<table>
<thead>
<tr>
<th>Unit Cost</th>
<th>Description</th>
<th>Link (Amazon.com)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.39</td>
<td>CR2032 3-volt Lithium Coin Cell</td>
<td><a href="http://amzn.com/B008XBK7PG">http://amzn.com/B008XBK7PG</a></td>
</tr>
<tr>
<td>$0.10</td>
<td>Flashing RGB 5mm LED</td>
<td><a href="http://amzn.com/B006LUZLNY">http://amzn.com/B006LUZLNY</a></td>
</tr>
<tr>
<td>$0.50</td>
<td>Round Disk Magnet (ceramic or rare earth)</td>
<td><a href="http://amzn.com/B013X34R0Y">http://amzn.com/B013X34R0Y</a></td>
</tr>
<tr>
<td>$0.05</td>
<td>Beer Pong Ball (optional)</td>
<td><a href="http://amzn.com/B001AWSJQE">http://amzn.com/B001AWSJQE</a></td>
</tr>
<tr>
<td>$1.04</td>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>

Resources

Graffiti Research Lab (via Instructables): ‘LED Throwies’
http://www.instructables.com/id/LED-Throwies/

Evil Mad Scientist Laboratories: ‘Some thoughts on throwies’
(Basic circuit analysis of throwies and discussion about the absence of resistors in the circuit)

LilyLEDs: ‘100 LED Throwies Kit’ ($70)
http://www.lilyleds.com/9287/100-LED-Throwies-Kit-Any-Color

The Oakland Toy Lab (via Instructables): ‘Learning about Motion with Light Painting’