

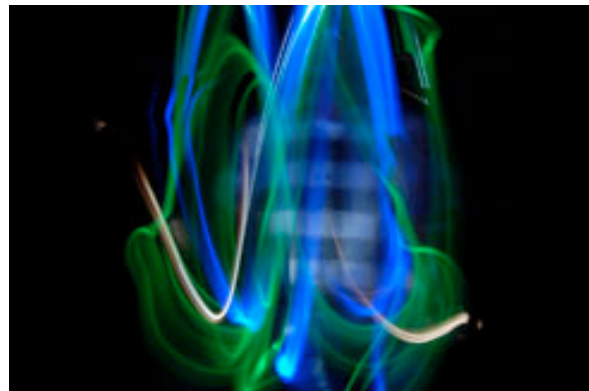


"When you're curious, you find lots of interesting things to do." - **Walt Disney**

Painting with light is an imaginative and fun way to experiment and experience light. Light painting is our ability to capture the creative movement of light. One person paints with a light source such as a flashlight while someone else takes a photograph of it.

TRON producer **Justin Springer** explains why light is such an important element in the movie:

"Light is really what gives TRON its unique aesthetic. It is the most important unifying element on the Grid—it is the primary source of power, coursing through all of the programs, the vehicles and the architecture of the world. The uninterrupted ribbons of light give everything a pronounced and distinct silhouette, which is what makes the imagery immediately identifiable as TRON. Creating this look for the film was not just a CG endeavor; practical light was heavily integrated into all of the sets, as well as the more than 140 highly-specialized costumes to bring the world of TRON alight."



What You Need:

1. Digital camera with long exposure shutter setting
2. A variety of light sources (flashlights, LED's, toys with lights, cell phone, etc.)
3. Nice to haves: Tripod and Shutter Release Cable



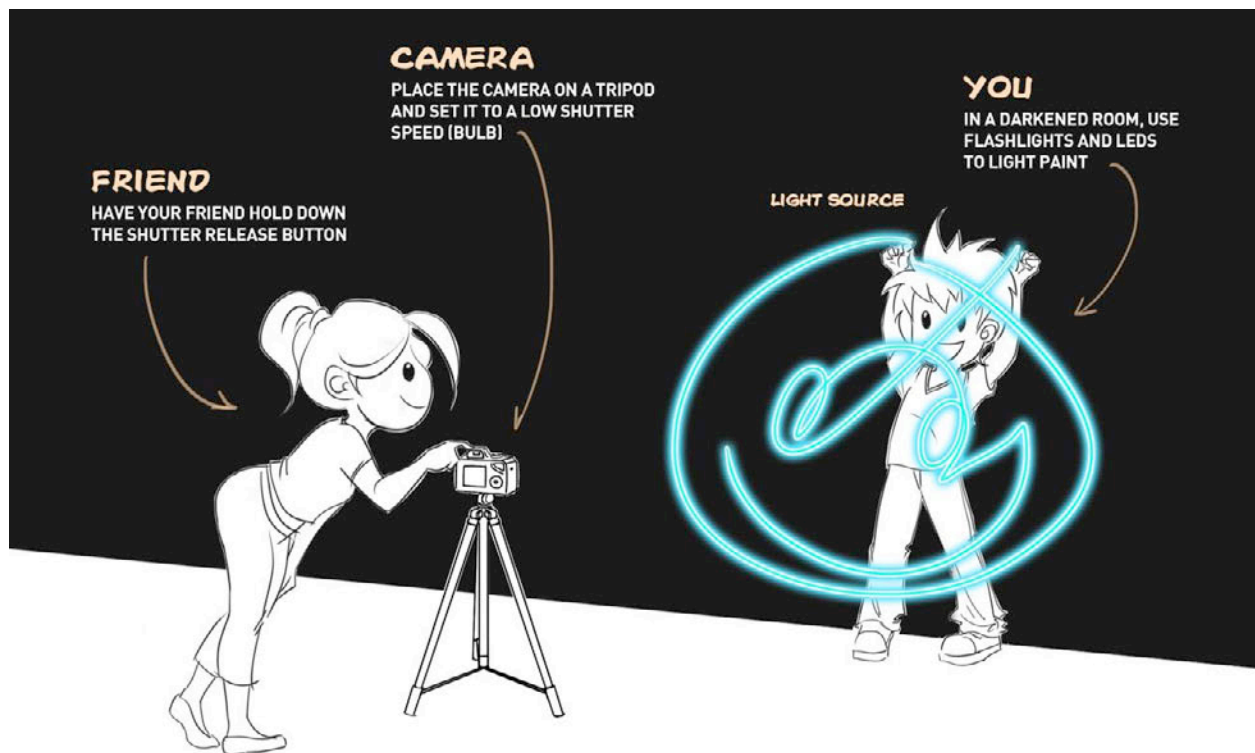
Location of the Shot & Setting the Scene:

- You need to find a very dark room/location – any light will affect the painting.
Make the room as dark as possible
- Dark backgrounds are also recommended
- Make sure you have space to move around
- The person doing the light painting should wear dark clothes

Setting Up Your Camera:

- Set the camera up on a stable surface (or on a tripod)
- Using the auto focus function, focus on something that is not moving
- Put your camera into Manual mode (M on some cameras)
- Set your camera to take “long exposure” images. Some digital cameras have “Shutter Priority” or “Bulb” settings that will allow you to take long exposure images.
- Turn out the lights
- Have someone press the shutter release button on the camera
- Once the shutter is open, point your light source towards the camera and start “painting”

Have Fun!!!!



Creative Exploration for Creating Light Paintings: an Imagineer's Process

1. We began with a **question**: How can we create an interactive light painting activity for children to enjoy?

2. We **imagined** what we could do. (dreamed, believed, supposed, visualized, thought and wondered)
3. We **designed and built** our first version of the light painting system. It was cobbled together with older hardware, which was on hand. The hardware would only support black and white video, and did not support rotating of the images, OR the possibility of a drawn image that would fade over time (we spoke about possibly using that feature).
4. We **played** with the first version and had others come and play as well.
5. We **explored new solutions**, reflected on what we had built and re-designed and re-built. In order to get around these limitations, we moved to the computer version where we have assembled software to allow us to do color and rotation. We also changed the show scenario to “drawing-in”.
6. We **shared** the changes with others and continued to work towards our goals.
7. We **expanded** our vision and through wondering and research we were able to find materials that would achieve our goals of rotation and painting in color. While this was not a trivial process, it is exciting to know what we can do what we had imagined.
8. Once this is completely built we will **reflect and evaluate** our work.

Can you think like an Imagineer and create your own unique approach to light painting?

What can you do with your light sources to make your painting easier or different?

The Science of Light Painting:

Light is everywhere. Light travels in a straight line (rays or beams that form a “wave”) out from its source. The distance between these points is called a wavelength. An example of colorful wavelengths is the rainbow. Light comes from many sources such as fire, light bulbs, flashlights, LEDs, fireflies and, of course, the sun.

Light is a form of energy that can be detected with your eyes. It combines magnetic and electric energy that travels extremely fast. Light is estimated to travel at an approximate rate of 300,000 km. per second. It can pass through **transparent** materials such as glass. It can also pass somewhat through **translucent** materials such as white paper. But light cannot pass through materials that are **opaque** such as a cement wall.

Think about the light source as you are painting, how can you change how the light looks?

What happens if you wrap the light in plastic wrap or other transparent materials?

What happens if you wrap the light in white paper or other translucent materials?

The Engineering of Light Painting:

Engineers have created an **image sensor** that acts as an electronic eye in today's digital cameras. In fact, it's much more sensitive than photographic film. Called a **Charge-Coupled Device**, or CCD, the sensor detects individual "pieces of light," called photons, and generates a specific electric charge depending on the light's color. That information is stored in individual pixels and translated into digital form, making it easy to manipulate images with a computer. When a camera's shutter is held open during light painting, more light is collected, making the images more intense. These are examples of how engineering can be a powerful **tool for creating art**, but the CCD does much more. Its uses range from tiny cameras that can go inside our bodies to space telescopes. Oh, and the guys who invented the CCD – Willard Boyle and George Smith – won both the National Academy of Engineering's Draper Prize and the Nobel Prize!

Here are some light paintings others have done. Try it out and see what you can do.

