

# The Formula

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*By Patrick Staight*

## Part one: the setup

Characters one and two are looking at a perplexing object which is near them, out of the picture, and in the direction of the camera. It may be an alien artifact that landed on Earth.

Character one seems to have realized something.

One:  
"It's the instruction manual."

There is a pause

Slowly character two reaches to touch the perplexing thing then xhe tenses in shock.

## Part two: the white room

We see flashes of childhood memories. Oddly all the memories increasingly involve light bulbs. We dwell on a scene of two's father writing a date on a burned out compact fluorescent bulb and adding it to a pile in a basket in a hall closet.

Father (In a muffled voice):  
"It's like their randomness is random."

After the memory flashes stop, character two finds xerself in a featureless white room. There are lightbulbs floating in the air. Each going on and off differently, as if they are trying to show xer some mysterious pattern.

The twinkling bulbs separate into two clouds. One cloud is burning out mostly all at the same time with some before and after: 1,1,2,4,4,2,1,1.

In the other cloud, half the bulbs burn out at each step. 8,4,2,1,1.

The bulbs repeat themselves. Character two doesn't see the pattern or xhe doesn't see why it's important.

The bulbs try harder.

The second cloud, which are all CFLs, moves to form a 4x4 grid in front of xer. The bottom 8 go out, then 4 on the right, then 2 on the inner left, then 1 then 1. They clearly demonstrate that half are going out each time.

Xhe walks past the 4x4 of CFLs and begins to pace across the room.

In the background a set of filament bulbs have lined up in a row of columns with taller columns in the middle, making a shape that's not quite a rounded triangle. One by one each column burns out down the row.

Xhe's not paying attention.

The bulbs decide it's time to make xer understand.

Xhe stops in xer tracks.

One of the bulbs seems to have caught xer attention. Xhe looks directly at it for a moment and then begins freaking out.

*For this part we see random shots of the room and character two. We use odd camera angles, color distortion, intense sounds and crazy green lighting. There is also quite a bit of screaming going on.*

For a moment in the chaos we see two standing frozen in the original scene. Xhe is not screaming and there is a green laser shooting in xer eyes. Then we return to the chaos. A weird green light flickers everywhere in the room.

Grainy shots of green highlighted bulbs get increasingly close to the camera.

On the surface of a CFL bulb the green light is jumping around like a tiny oscilloscope. For an instant it makes the shape of an exponential curve.

In the same sequence there are flashes of filament bulbs. On their surface the green light is making a bell curve. Again we only see this for an instant.

The chaos stops.

Character two and the bulbs are on the floor. Slowly xhe sits up and catches xer breath. Then xhe looks over to a filament bulb lying nearby.

Xhe reaches to touch it.

We see a flash of a crisp picture of a bell curve framed by a horizontal and vertical axis, drawn in black on a white background.

Xhe pulls xer hand away.

Xhe goes to touch it again.

We get to enjoy the beauty of the bell curve again this time for a few seconds.

Back to xer. Xhe is blinking. Then xhe goes to touch a CFL bulb. We enjoy the exponential curve for a moment.

Back to xer. Xhe peacefully touches one and then the other then back to the first.

## Part three: my father

We see the lower legs and shoes of a new character step into the camera frame.

Character two looks up to see xer father.

Father:  
"Now you understand"

"The old kind of light bulbs work like a bell curve."  
"They mostly burn out at the same time"  
"with a couple before or after."

"Fluorescent bulbs have a half-life."  
"If you have some CFLs that work today"  
"half of them won't work next time."

"It doesn't matter if you just got them out of the box"  
"or if they have been burning for a million years."

He looks at a CFL he's holding.

Father:  
"Randomness is random for them."

Character two is silent as xhe contemplates this.

His father turns to leave.

Two:  
"Wait, I want to know more"  
"I want to know everything."

Xer father is walking away.

Father:  
"Understanding everything is a simple trick."  
"You just have to think about it all at once."

We see Character two pickup one bulb then the other.

Holding both at the same time, xer eyes begin to widen.

## Part three: off the deep end

*For this part, we focus on the intrinsic beauty of knowledge. The visuals are crisp and very simple.*

We see the exponential curve.

We see the symbols  $e^x$ .

We see a flurry of images of direction symbols that have 2 choices:

A compass pointing North-South then a time-lapse 360 panoramic night sky warped to fit the 2D screen, starting with sunset and ending with sunrise.

We see a circle on a line graph. North and South are top and bottom. West and East are left and right.

Counterbalance weights bobbing up and down then left and right hands moving in light and shadow.

We see a circle on a line graph  $\uparrow$  and  $\downarrow$  are top and bottom. Then  $\leftarrow$  and  $\rightarrow$  are left and right.

A Chinese couple doing something the Chinese zodiac predicts Rabbit Rooster couples do then a different couple doing Horse Rat things.

We see a circle on a line graph 卯 and 酉 are top and bottom. Then 午 and 子 are left and right.

Barack Obama and John Boehner shaking hands then several Hamas leaders taking seats in the Knesset.

A donkey and an elephant symbol on a white background with a red line on top and a blue line on the bottom then a blue Star of David next to a blue Star and Crescent on a white background with blue lines top and bottom.

A 40x30 rectangle. The lower right quarter of the icons are checkered black and white keffiyeh. They move in to complete the rectangular shape.

The other three quarters are icons of kippot and payot (skullcaps and sidelocks). Together the brothers and sisters in the icons flash slightly with joy.

We see a circle on a line graph  $i$  and  $-i$  are top and bottom. Then 1 and  $-1$  are left and right.

We see the symbols  $e^{ix}$ .

We see the power series expansion of  $e^{ix}$ .

The first term is 1 followed by  $+ix$  then  $-x^2/2!$  and so on.

All the terms in the odd positions move up as the even terms move down.

As if by strange coincidence, all the odd terms happen to have the symbol  $i$ , none of the even terms do.

All the  $i$  symbols disappear as a single  $i$  symbol reappears at the left end of the upper series.

We flash to the bell curve. Then a new function we've never seen before replaces it. The function is somehow in-between the CFL feeling and the filament bulb feeling. It is a sin wave function.

We see the two power series formulas again.

The terms on the top disappear and are replaced by the formula " $\sin x$ ". The  $i$  symbol hasn't changed.

The terms on the bottom disappear. “cos x”.

The top and bottom come back together, the top moving down, the bottom moving up.

As they meet the two disappear and are replaced by the formula “cos x + i sin x”, we dwell on this.

We see the formula-symbols  $e^{ix}$ .

Then we see:  $\cos x + i \sin x$

The two images flash back and forth picking up speed

We see a mid-close-up of character two beginning to get disturbed but then xhe returns to peace.

$$e^{ix} = \cos x + i \sin x$$

We dwell on this for a bit

$$e^{i\pi} = \cos \pi + i \sin \pi$$

$$e^{i\pi} = 0 - 1$$

$$e^{i\pi} + 1 = 0$$

## Part four: the conclusion

We return to the opening scene.

Character two breathes out and slowly withdraws xer hand.

One:

“what happened? Do you know how it works?”

Two:

“no”

Two pauses for a moment. Then xhe speaks slowly, focused distantly.

Two:

“I know how everything works”

End

## An idea about the sound track:

We start off with soft music playing in the background. The instruments are slightly out of tune but most people won't notice. As the story progresses new musical phrases are introduced and explored. This is creating a lot of dissonance and suspense but not much in the way of resolution.

When we get to the really intense stuff the music will contain like 8 musical voices, all trying to find resolution with each other. I'm not really sure if the number is 8 but I know that any more than 3 row-row-row your boats' is going to be kind of the same. Everything has proper musical structure but unless you have a gift for music no one else has got, it's going to be hard to follow.

When we get to climax a single pattern becomes apparent. (Maybe everything else just stops, I'm not sure.) This pattern has been there the whole time but came from nowhere. It has been playing on frequencies found in the dissonance of the other sounds. What sounded like out of tune music actually had a couple of unexpected prime factors in common.

It is this pattern that finally brings resolution to everything else.

I'm hoping it's possible to find a music theory way to make this do something interesting for everyone. However, I fully realize there is a good chance only an academic with a frequency analyzer will notice the auditory illusion did anything to resolve anything. Really I'm just putting this idea here because I think it's interesting.



