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Fall 2021 Video 2  
ATLS 4151: Flow Visualization  
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**I. Introduction**

The purpose of this video was to show the phenomenon of the travelling flame trick, which is a candle being lit from the smoke produced by said candle. My friend showed me this when I was younger and always thought it was super cool but never really understood how or why this occurred. I thought it was the perfect opportunity to be able to capture this trick in an artistic way and to really dive into the science behind exactly why this is able to happen.

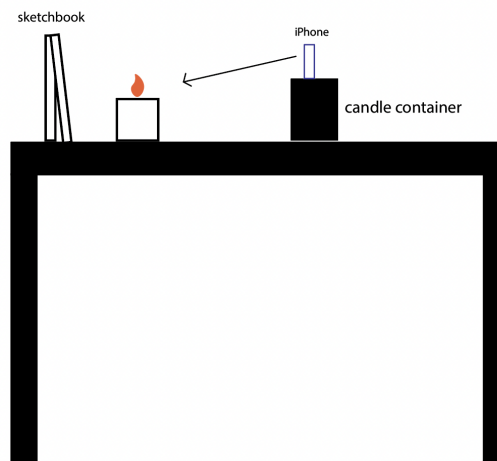
**II. Flow Apparatus**

When a candle is lit, the heat from the flame vaporizes the wax of the candle. When the flame of the candle is blown out, this vaporized wax lingers in the air. You cannot actually see this vapor but it moves with the smoke that is visible when a flame is blown out. When this wax vapor is heated quick enough it can be reignited and in turn light the candle again. This leftover vaporized wax lights up and burns which is how you can see the trail of flame going back down to the wick. On a larger scale, smoke that comes from big fires contain combustible gasses which allows for a nearby flame to reignite the main fire.

**III. Visualization Technique**

I took this video outside in the daylight around 12:30 in the afternoon in late September. I set a Pickwick & Co. candle on a foldable table with a sketchbook propped up behind it to create a white background. I lit the candle with a basic Bic lighter and held my iPhone on top of the container that came with the candle in order to keep it steady. Once I started the slow motion recording I blew out the candle and relit the smoke using the lighter with my free hand.

Fig. 1 Photo Set up



### **III. Photographic Technique**

I used my iPhone 12 Pro's camera with the slow motion feature to record this video and set it to 2x zoom. The phone was positioned about 8 inches away from the candle and filmed with 1080p, dimensions of 1920x1080 and 239.54 frames per second.

### **IV. Final Results**

I am overall pretty happy with my end video. I do wish I had thought about the presentation of this travelling flame trick in a more creative way. I would also consider picking a candle that is not in a glass container since the ash and wax makes it look slightly messy. A regular candle stick would maybe look cooler. I am glad I did this video though and was able to research and learn about the science behind the phenomenon, which I thought was very interesting. I also really enjoyed adding the sound effects and music behind the video, I think it adds a lot of drama and fun to the simple original video.

## References

Anne Marie Helmenstine, Ph.D. “Re-Light a Candle from a Distance with This Science Trick.”

*ThoughtCo*, ThoughtCo, 4 June 2020,

<https://www.thoughtco.com/traveling-flame-science-trick-607505#:~:text=When%20you%20light%20a%20candle,flame%20vaporizes%20the%20candle%20wax.&text=If%20you%20apply%20a%20heat,the%20wax%20vapor%20that%20ignites>.