What Are You Smokin'?

THE CHEMICAL COMPOSITION OF TOBACCO

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Introduction:

Tobacco is an agricultural crop that is grown all over the world.

Tobacco is a product prepared from the leaves of the tobacco plant by curing them.

In cigarettes and cigars, tobacco is often mixed with a variety of chemicals to give them more flavor, make them more addictive and produce desired smoking effects.

Tobacco contains the alkaloid nicotine, a psychoactive key ingredient.

Nicotine is a central nervous system stimulant that generates biochemical and neurotransmitter disruptions. Nicotine elevates heart rate and blood pressure, constricts blood vessels, irritates lung tissue, and diminishes your ability to taste and smell.

Nicotine is as addictive as heroin and cocaine, and it only takes 8 seconds for nicotine to reach the brain.

Nicotine is composed of carbon (10), hydrogen (14) and nitrogen (2) atoms. Its chemical formula is $C_{10}H_{14}N_2$.
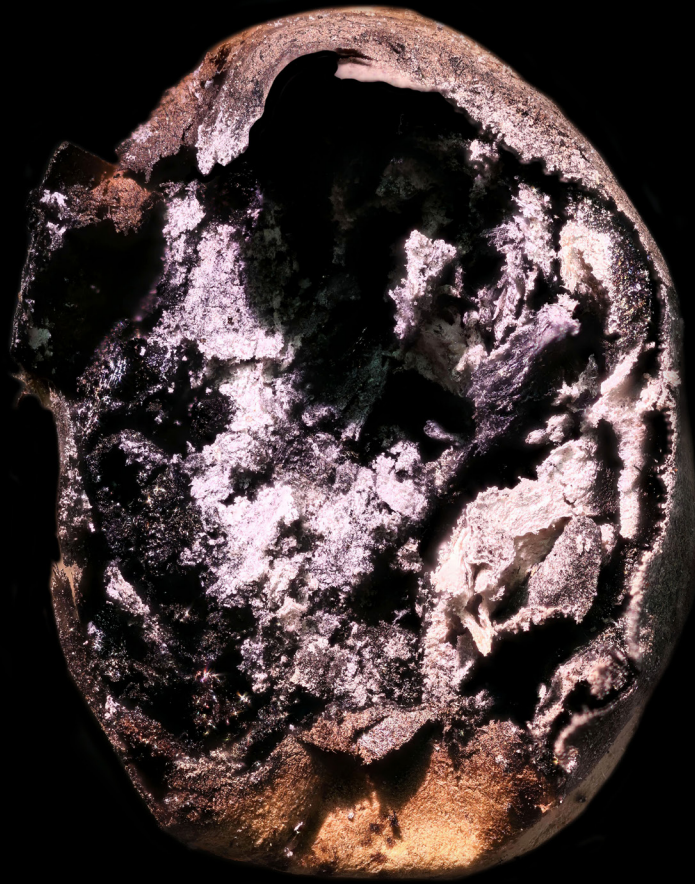
Facts:

- Tobacco kills up to half of its users.

- Tobacco kills around 6 million people each year. More than 5 million of those deaths are the result of direct tobacco use while more than 600,000 are the result of non-smokers being exposed to second-hand smoke.

- 9 out of 10 smokers start before the age of 18, and 98% start smoking by age 26.

- More than 100,000 of the smoking-caused deaths over the last 50 years were of babies who died from SIDS.

- Some of the toxins found in cigarette smoke are found in items such as toliet cleaners, formaldehyde, and rat posion.

- Every year, cigarette companies spend over $13.11 billion on advertising and promotional expenses. This equals to approximately $36 million per day.

- Cigarette smoking is responsible for more than 480,000 deaths per year in the United States, including nearly 42,000 deaths resulting from secondhand smoke exposure. This equals to approximately one in five deaths annually, or 1,300 deaths every day.

Cigarette

A cigarette is a small cylinder of finely cut tobacco leaves rolled in thin paper for smoking.

A cigarette is distinguished from a cigar by its smaller size, use of processed leaf, and paper wrapping.

Cigarette smoke contains over 4,000 chemicals, including 43 carcinogenic compounds.

Cigar

A cigar is a tightly-rolled bundle of dried and fermented tobacco leaf, rolled in a series of types and sizes.

Cigar smokers may spend up to an hour smoking a single large cigar that can contain as much tobacco as a pack of cigarettes.

A single large cigar can contain more than a 1/2 ounce of tobacco, which is equal to an entire pack of cigarettes. A cigar contains 100 to 200 milligrams of nicotine, while a cigarette averages only about 8 milligrams.
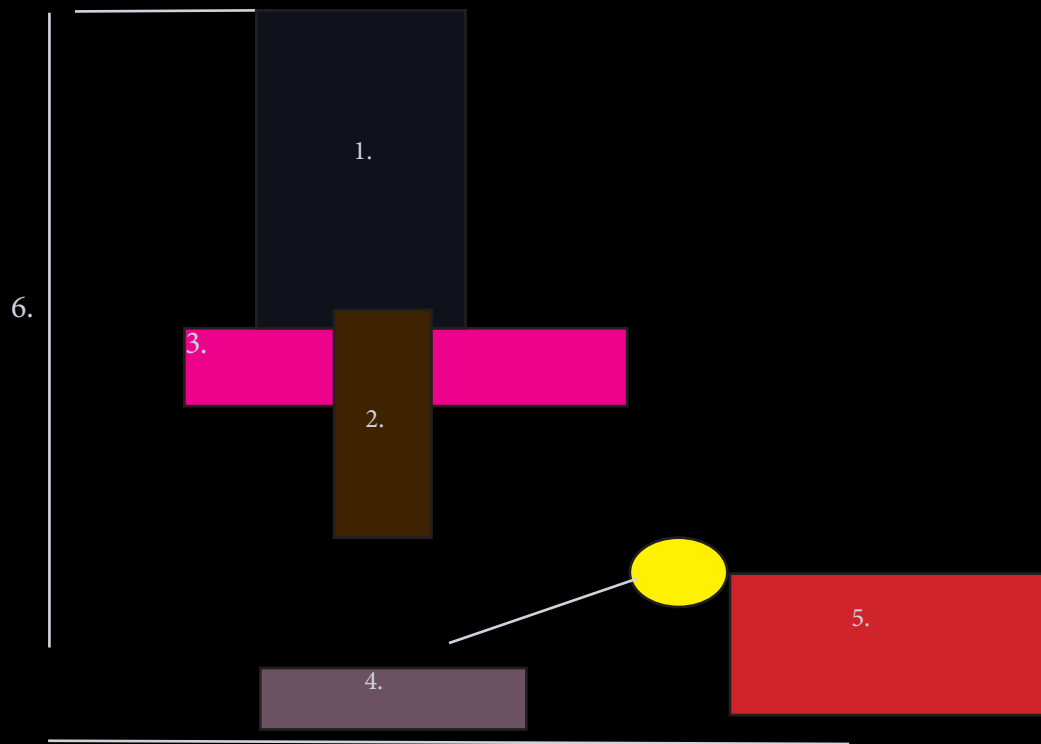
Pipe Tobacco

Pipe tobacco is loose leaf tobacco used in a traditional smoking pipe with a bowl.

The American Cancer Society indicates that pipe smokers face many of the same health risks as do cigar smokers.

Pipe tobacco is more coarse and moist, it is used for pipe smoking.

Lighting Set-Up

1. Camera Body
2. Camera Lens
3. Focus Stacking Rail
4. Subject
5. Fiber Optics Body
6. Copy Stand

Technique: Focus stacking is a digital image processing technique. Focus stacking combines severalimages taken at different focus distances to give a finalized image with a greater depth of field. One of the great things about focus stacking is that it offers flexibility; it is a computational technique.

StackShot is an electronically controlled macro rail system that coordinates the movement of the macro rail and the triggering of the camera.

All images were complied into Zerene Stacker. This application is a "focus stacking" software designed to generate each image into one single image.

SOURCES

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https://quitsmokingcommunity.org/how-to-quit-smoking/what-is-tobac-co/

https://pubchem.ncbi.nlm.nih.gov/compound/nicotine

Equipment Used
Canon 5D Mark III
Canon 65mm 1-5x macro lens Canon 100mm macro lens Canon MR-14EX Fiber Optic light
Mount
Focus Stacking Rail

Alexandra Boland is a nurse and fourth-year student at Rochester Institute of Technology, working towards a Bachelors of Science degree in Imaging Science. Anticipated graduation is in May of 2017. Alexandra is interested in specializing in clinical informatics or forensics. She enjoys the many different sides of scientific photography, including, but not limited to, macro and microscopic photography, and medical photography.

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