

Neurotransmission: “Nicotine in the Body”

GOAL

The goal of this lesson is for students to understand how cigarette smoke travels through the respiratory system and the bloodstream to the brain.



Set-up:

- Nicotine and the Respiratory System poster
- White paper for each student
- Colored pencils to share



PROCEDURE

Engage (10 minutes) Brainstorming: Reasons for Smoking

- Tell students that in today’s class they will learn how cigarette smoke travels through the body.
- First ask: What reasons might people have for smoking cigarettes?
- Create a class web listing reasons people might smoke cigarettes.

Explore (10 minutes) Cigarette Smoke Contents

- Ask students what cigarettes are made of *(tobacco, paper, filters.)
- Describe the contents of cigarette smoke. These include nicotine, burned tar, ammonia, and carbon monoxide.
- Ask where cigarette smoke goes after a person inhales. “Where in the body does it travel?”

Explain (15 minutes) Nicotine and the Body

- Explain that nicotine enters the body through a nicotine/tar mixture that is inhaled from a lit cigarette both through the mouth and the nose.
- Nicotine travels through the respiratory system before reaching the bloodstream.
- Using the poster of the respiratory system, identify the different parts of the respiratory system.
- Explain the sequence followed by nicotine as it travels through the respiratory system:
 - Air goes in through the nostril & into the nasal cavity. The pharynx is the area in the back of the throat, the larynx (voice box) is just below (posterior to) that.
 - Air then travels down the windpipe (trachea), which branches into two bronchi (one bronchus leads to each lung).



PROCEDURE

-Once inside the lung the bronchi branch out into smaller tubes called bronchioles which lead to clusters of air sacs. The air sacs are called alveoli. Here, nicotine can move from the lungs into the bloodstream where it is delivered to all parts of the body including the brain. Emphasize that the tar is known to cause cancer and the nicotine is highly addictive.

Evaluate: (20 minutes) Drawing Nicotine's Path in the Body

- Ask students to use art materials to draw the human body and the path of cigarette smoke/nicotine from the cigarette to the brain.
- Students can take any approach to their art work as long as they show the cigarette, and nicotine moving through the respiratory system into the lungs and then the brain.
- The different parts of the respiratory system should be labeled.

Expand: (5 minutes) What Happens Next?

- Ask students what happens next?
- What effects do they think nicotine has on the brain?

- **Key Cognitive Skills:** Sequencing
- **Vocabulary:**
 - Cigarette
 - Tobacco
 - Nicotine
 - Respiratory System
- **Specific Outcomes:**
 - Students will brainstorm reasons why people smoke cigarettes.
 - Students will learn about the different chemicals in cigarette smoke.
 - Students will understand the sequence by which smoke travels through the respiratory system into the bloodstream.

PROJECT 2061 BENCHMARKS FOR SCIENTIFIC LITERACY

6C Basic Functions

By breathing, people take in the oxygen they need to live.

6E Physical Health

Tobacco, alcohol, other drugs, and certain poisons in the environment (pesticides, lead) can harm human beings and other living things.

11A Systems

In something that consists of many parts, the parts usually influence one another.

12C Manipulation & Observation

Make sketches to aid in explaining procedures or ideas.

