**Title:**  [How Nicotine Affects the Teen Brain](https://nida.nih.gov/research-topics/parents-educators/lesson-plans/how-nicotine-affects-teen-brain)

**Project Introduction:** While student smoking rates have declined in recent years, e-cigarette use has risen—an alarming trend, because most vaping devices contain the highly addictive drug nicotine. In this lesson, developed in partnership with Scholastic, students read "How Nicotine Affects the Teen Brain" to understand how nicotine is not only highly addictive, but can also cause lasting effects on their brain. An article and worksheet get students to think critically about the real health risks of nicotine and vaping nicotine. Then students complete the "Vaping Health Risks" presentation activity, to guide them to conduct deeper research into specific vaping risks and help spread the word to their peers (NIDA, 2023, para. 1).

Teen vaping is on the rise everywhere - especially in West Virginia, where 25.2% of WV adults are smokers (*Cessation,* n.d.). Surely, this affects HSTA students and their peers. This intervention will serve as an opportunity to provide an intervention to middle school or high school aged students on how nicotine can negatively impact the teen brain.

This project will be carried out in the form of an intervention. HSTA GA’s will create a PPT presentation for high school students to use for their intervention when facilitating this presentation to high schoolers or middle schoolers. This PPT will give HSTA students a guide for their intervention to run smoothly so they can perform a more sufficient statistical analysis of the data that will be collected from this project. HSTA GA’s will also create a pre- and post-test for students to use for data analysis.

**Materials and summary of procedures:**

* **Materials** (all are linked on page 1 of this outline)
  + Project outline
  + Pre/post-test
  + PPT supplemental materials
  + Article by WV DHHR and NIDA lesson plan
* **Populations**
  + Middle school aged students (10-14)
  + High school aged students (14-18)
* **Data comparisons**
  + Differences among gender
  + Differences among age groups grade levels
  + Differences among students at different schools
* **Possible Constants** in addition to inclusion criteria
  + Gender
  + Grade level
  + Using students from a different school

**Possible research questions and data analysis**

* After an educational intervention on nicotine and the effects it has on the brain, will there be a statistically significant difference in knowledge scores among females in fifth grade who attend ABC Elementary School?
  + Independent Variable: Pre Intervention and Post Intervention
  + Dependent Variable: Pre and Post scores
  + Control: no control group
  + Constants/Inclusion Criteria: Females in 5th grade , same intervention, same school
  + Data Analysis: t-test to compare knowledge levels/gains among Pre intervention and Post intervention for fifth grade female students
* After an educational intervention on nicotine and the effects it has on the brain, will there be a statistically significant difference in knowledge scores among females in fifth grade who attend ABC Elementary School compared to a control group of 5th grade females?
  + Independent Variable:Intervention group and Control group
  + Dependent Variable: Pre and Post Scores
  + Control: the group with no intervention
  + Constants/Inclusion Criteria: : Females in 5th grade, same survey questions, same intervention, same school
  + Data Analysis: t-test to compare change knowledge levels/ gains among intervention and no intervention groups
* After an educational intervention on nicotine and the effects it has on the brain, will there be a statistically significant difference in knowledge scores, among middle school females and males who attend ABC Middle School?
  + Independent Variable: males and females
  + Dependent Variable: change in Pre and Post scores
  + Control: no control group
  + Constants/Inclusion Criteria: Gender-male and females students, same intervention, same school
  + Data Analysis: t-test to compare change in scores for females and males
* After an educational intervention on nicotine and the effects it has on the brain, will there be a statistically significant difference in knowledge scores for students in grade (level A) and students in grade (level B)?
  + Independent variable: Grade Level A and Grade Level B
  + Dependent variable: change in Pre and Post test scores
  + Control: no control group
  + Constants/Inclusion Criteria: Grade level of students, the content of the intervention, survey questions,
  + Data analysis: t-test to analyze change in scores [ANOVA if you are comparing three or more grade levels]

**Draft Procedures:**

**Procedures:**

1. Read through the project outline, pre- and post-test, and supplemental PPT provided by GRA’s.
2. Recruit 30 participants for intervention - use the recruitment/cover letter script when recruiting folks to participate in your intervention. Be sure to record how you recruited these participants (social media, word of mouth, online survey sent via text, etc.)
3. Before the intervention, go over the supplemental PPT provided with a HSTA teacher and/or GA/CRA so you are prepared.
4. **(Slides 1-3):** This is your title slide, your introduction slide, and your table of contents slides. You will be entering your own personal information here, which is why it is important to look at the PPT beforehand.
5. **(Slides 4-6)**: These are your pre-test slides. Take some time to introduce the pre-/post-test format to your participants (slide 5). Administer the pre-test on slide 6.
   1. Give your participants 5-10 minutes to complete the pre-test.
6. **(Slides 7-11)**: Starting on slide 7, you will be presenting the discussion portion of the intervention. This is where the questions from your pre-and post-test will come from. Do not read directly off of the PPT - either make mental notes or notes on an index card to go more into depth about the newspaper article in which this intervention is based on. A helpful tip during your intervention is anecdotal evidence - do you have experiences with your peers vaping/smoking? What measures has your school implemented to curb nicotine use? How does it disrupt your school day?
7. **(Slides 12-13)**: After the supplementary material has been introduced, click on the video in the PPT (it should play directly from the slide). Once the video is done, ask your participants about the issues they see reflected in their peers using nicotine products.
8. **(Slides 14-15)**: After you have completed the video discussion with the participants, click onto the next slide, which should be entitled “04: Post-Test” (slide 14). Slide 15 will say “Post-Test Time”, and this is when you administer the test.
   1. Give students another 5-10 minutes to complete the survey. Once the survey is completed, collect it from them and complete the intervention.
9. **(Slide 15)**: Wrap up your intervention by fielding any remaining questions.

**Recruitment/Cover Letter Script:**

Hello!

My name is [insert name here]. I am a [insert school year here] at [insert high school here] who is working on a project for [insert HSTA region here] Health Sciences and Technology Academy (HSTA).

The project I am conducting this year is an intervention exploring how nicotine negatively impacts the teen brain. I will be providing an intervention to [middle school or high school students] at [insert school name here]. This intervention will include a pre- and post-test in order for me to collect data to see [Use the research question you selected, turn it into a statement and insert here]. The intervention should take around 30 minutes, with each survey taking around 5-10 minutes each.

No personal data will be collected, and each participants’ identity will be protected. Any participant may back out of the intervention at any time.

Thank you for your participation - this research project will allow me to educate my peers about how nicotine can negatively affect the teen brain.

Signature

**References:**

*Cessation*. (n.d.). https://dhhr.wv.gov/wvdtp/cessation/pages/default.aspx

*How Nicotine Affects the Teen Brain: National Institute on Drug Abuse*. (2023, March 31). National Institute on Drug Abuse. https://nida.nih.gov/research-topics/parents-educators/lesson-plans/how-nicotine-affects-teen-brain